

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 showing 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, 1916:—

**ROADS AND BRIDGES.—TOTAL GOVERNMENT LOAN EXPENDITURE TO THE
30th JUNE, 1916.**

State, etc. ...	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania. ¹	C'wealth.
Expenditure	£1,835,940 ¹	£964,323	£931,775	£1,622,710	£363,523	£4,588,560	£10,306,831

1. Including punts. 2. Including harbours, jetties, 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 1911 to 1916:—

**ROADS AND BRIDGES.—LOAN EXPENDITURE BY STATE GOVERNMENTS,
1901-2 and 1911-16.**

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
1911-12 ...	...	...	...	...	35,414	211,052	246,466
1912-13 ...	53,263	...	...	...	37,037	183,625 ²	273,925
1913-14 ...	23,553	...	...	17,838	...	191,428 ²	232,819
1914-15 ...	8,609	274,362	...	37,910	31,974	208,584	561,439
1915-16 ...	421	495,062	...	102,226	18,450	165,701 ²	781,860

1. For the calendar year 1902. 2. See note 2 to previous table.

The two tables given above shew only a small proportion of the actual expenditure upon roads and bridges in the different States, for the reason that (a) there have been large expenditures from revenue, both by the central Governments and by local authorities, and (b) the State Governments have in many cases voted grants and subsidies, and 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, 1915, 31 miles of roads, 275 bridges, 55 wharves, 99 jetties, and 16 ferries have been proclaimed as "National" works. Power is given to construct new roads, to widen or close existing roads, to make by-laws for the regulation of traffic, etc.; in the case of the acquisition of land for the purpose of constructing new roads or of widening existing roads, the provisions of the Roads Act 1902 are incorporated. The Minister for Works is empowered to pay subsidies to the local authorities to maintain the roads. The roads leading to and within areas of lands which are made available for closer settlement will be constructed by the Government prior to transfer to the shires, as also will roads required mainly for tourists in districts not likely to produce revenue in rates to the local authorities.

(i.) *Principal Main Roads.* The four principal main roads in New South Wales run in the same direction as, and are roughly contiguous to, the four state-owned main railway lines. (a) *The Southern Road*, 385 miles in length, runs from Sydney to Albury, and before the days of railway construction formed part of the highway over which the interstate traffic between Melbourne and Sydney used to flow. (b) *The South Coast Road*, 250 miles long, runs from Campbelltown along the top of the coast range and across the Illawarra district as far as Bega, from which place it extends as a minor road to the southern limits of the State. (c) *The Western Road*, 513 miles long, runs through Bathurst, Orange, and many other important towns as far as Bourke, on the Darling River. (d) *The Northern Road*, 405 miles in length, runs from Morpeth, near Maitland, 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 31 miles proclaimed as "National" works) in 1915 was approximately 97,811 miles, of which 10,261 miles were controlled by municipalities, 81,075 by the shires, and 6475 miles were in the unincorporated areas of the Western Division. The following table gives particulars for the year 1915 (the latest year for which figures are available), of roads classified according to whether metalled, etc., formed only, cleared only, or natural surface:—

NEW SOUTH WALES.—APPROXIMATE LENGTH OF ROADS, 1915.

Classification.	Metalled, Ballasted, Gravelled etc.	Formed only.	Cleared only.	Natural surface.	Total.
	Miles.	Miles.	Miles.	Miles.	Miles.
Metropolitan... ..	1,400	330	246	196	2,172
Country municipalities	2,676	1,638	1,897	1,878	8,089
Shires... ..	14,342	10,404	24,731	31,598	81,075
Western Division	100	196	2,752	3,427	6,475
Total	18,518	12,568	29,626	37,099	97,811

(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 1915, the latest year for which figures are available, are given in the following table:—

NEW SOUTH WALES.—BRIDGES, CULVERTS, AND FERRIES, 1915.

Particulars.	Bridges.		Culverts.		Ferries.
	No.	Length.	No.	Length.	No.
		ft.		ft.	
"National" works	275	105,330	...	...	16
Metropolitan... ..	130	6,133	844	78,117	3
Country municipalities	636	34,493	3,541	99,183	11
Shires	3,523	211,770	34,668	317,189	96
Western Division (unincorporated)	93	12,530	153	1,709	...
Total	4,657	370,256	39,206	496,198	126

(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 £25,212,540. In this expenditure is included the cost of administering the Department, services for other Departments, and payments on account of punt approaches and similar works incidental to the road traffic of the country. The amount expended from 1857 to the 30th June, 1900, for the next decennium, and for each succeeding financial year up to 1916, 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 ROADS DEPARTMENT AND ROAD TRUSTS, 1857 to 1916.

Period:	Expenditure by Roads Department.	Expenditure by Trustees.	Total.
	£	£	£
1857 to 30th June, 1900	18,714,078	1,258,027	19,972,105
1900-09	4,605,766	30,664	4,636,430
1910-11	125,326	...	125,326
1911-12	126,111	...	126,111
1912-13	120,719	...	120,719
1913-14	73,192	...	73,192
1914-15	92,729	...	92,729
1915-16	65,928	...	65,928
Total	23,923,849	1,288,691	25,212,540

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 1915, the control, construction, and maintenance of all roads, streets, and bridges are in the hands of Municipal Councils, who are empowered to open new roads, and to close, divert, or increase the width of any existing street or road, provided that no new road less than one chain in width may be opened without the consent of the Minister. The councils are also authorised to make and repair streets, lanes, or passages on private property, or to form means of back access to private property, and may compel the owners of such property to pay the cost of so doing. Footways in front of houses or grounds may be kerbed, flagged, paved, or asphalted, and the owners of such houses or grounds must bear half the cost of so doing. The revenue of the councils is derived from rates, which may be either ordinary or special. The councils are empowered to raise loans for the purpose

of making or opening new streets and roads, and for diverting, altering, or increasing the width of streets and roads, provided that the amount of such loan must not exceed ten times the average income of the council during the three years immediately preceding.

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

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

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

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

Up to the 30th June, 1916, there were 6500 miles of declared main roads, agreed to by the councils, and gazetted. The total amount of authorised contracts for permanent works was £182,624, and for maintenance work £53,644, a total of £236,268, affecting 122 municipalities. The expenditure incurred during the year ending 30th June, 1916, including contracts, day labour, and material supplied, amounted to £464,787. The net receipts for the year were £82,068, of which amount the chief items were motor registration fees, £39,740, unused roads and water frontages license fees, £20,754, and contributions by municipalities for permanent works, £12,847.

(ii.) *General and Local Government Expenditure.* The gross amount expended directly by the State Government of Victoria on roads and bridges was £8,749,678 up to the end of June, 1916. 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 1912 to 1916:—

VICTORIA.—EXPENDITURE ON ROADS AND BRIDGES, 1901 and 1912 to 1916.

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
1912	58,917	28,237	31,940	59,845	6,890
1913	73,374	49,743	30,758	51,034	5,566
1914	56,649	57,411	23,749	59,093	11,372
1915	47,898	103,124	40,129	53,365	8,647
1916	25,651	92,198	43,690	64,481	3,543

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, asphalted 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 Act 1914, the Municipal Corporations Acts 1890 to 1914, and of the Roads Acts 1884 to 1915, 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 Government grants account, 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 1915, 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, 1916, was as follows:—

SOUTH AUSTRALIA.—ESTIMATED LENGTH OF ROADS AND STREETS, 1916.

Particulars.	Woodblocked.	Macadamised.	Other.	Total.
Miles	6	10,103	33,511	43,620

(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 1911 to 1916 inclusive:—

**SOUTH AUSTRALIA.—EXPENDITURE BY CORPORATIONS ON STREETS, ROADS,
AND BRIDGES, 1901 and 1911-16.**

Year. ¹	District Roads.		Main Roads Fund.			
	Expenditure.		Receipts.		Expenditure.	
	Con- struction.	Main- tenance.	From Main Road Grants.	Total.	Con- struction.	Main- tenance.
	£	£	£	£	£	£
1901	4,906	50,628	7,403	8,738	159	7,745
1911	5,673	63,897	12,935	14,294	1,053	13,634
1912	10,907	59,609	11,477	11,865	322	12,590
1913	31,797	89,830	11,817	13,128	463	13,142
1914	8,909	95,970	12,573	13,516	361	11,949
1915	31,732	74,887	12,084	12,820	26	11,502
1916	25,483	73,118	9,669	12,098	88	13,679

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

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

**SOUTH AUSTRALIA.—EXPENDITURE BY DISTRICT COUNCILS ON STREETS,
ROADS, AND BRIDGES, 1901 and 1911-16.**

Year ended 30th June.	District Roads.		Main Roads Fund.			
	Expenditure.		Receipts.		Expenditure.	
	Con- struction.	Main- tenance.	From Main Road Grants.	Total.	Con- struction.	Main- tenance.
	£	£	£	£	£	£
1901	18,026	47,379	72,980	100,077	11,861	67,487
1911	44,289	63,811	110,397	111,182	24,660	82,115
1912	54,342	68,108	119,331	123,154	20,414	102,759
1913	56,128	76,880	106,482	108,489	14,915	96,673
1914	48,133	80,181	124,528	130,299	18,538	97,599
1915	51,625	85,119	114,722	114,781	15,571	102,679
1916	41,283	79,515	83,264	84,738	12,493	61,172

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, 1911 :—

WESTERN AUSTRALIA.—PARTICULARS OF ROADS UNDER CONTROL OF DISTRICT ROADS BOARDS, 1911 to 1915.

Year ended the 30th June.	Area.	Revenue.				Expenditure.	Length of Roads. ⁵				No. of Bridges and Culverts.	
		From Rates.	From Grants and Subsidies.	From other Sources.	Total.		Cleared only.	Formed only.	Metalled or otherwise Constructed.	Total.	Bridges.	Culverts.
1911 ...	Sq. m. 975,800	£ 59,302	£ 100,126	£ 16,474	£ 175,902	£ 141,015	15,169	4,874	3,119	23,162	653	5,211
1912 ...	975,809	70,397	64,774	36,497	171,668	196,576	16,484	4,555	3,432	24,471 ²	719 ²	5,808 ²
1913 ...	975,815	80,551	60,687	29,770	171,008	184,587	19,236	4,429	3,651	27,316 ³	721 ⁴	6,157 ⁴
1914 ...	975,815	93,700	63,668	46,031	203,399	187,800	19,921	4,626	3,804	28,351 ³	731 ¹	6,450 ¹
1915 ...	975,815	68,569	27,753	47,571	163,893	193,083	19,641	4,674	4,039	28,354 ³	761	6,649

1. Exclusive of two Boards which have not supplied the information. 2. Exclusive of five Boards. 3. Exclusive of four Boards. 4. Exclusive of three Boards. 5. Approximate only.

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 1911-15.

Year ended the 31st October.	No. of Municipalities.	Length of Streets and Roads. ²					Revenue.		Expenditure.	
		Paved, M't'll'd or Gr'v'll'd	Form'd only.	Clear'd only.	Not Clear'd	Total.	From Rates.	From Grants.	Works and Impr'vments.	Street Light'g and Wat'r'g
1901 ...	42	195	30	149	137	511	78,021	66,850	111,256	15,969
1911 ...	42	521	105	292	284	1,202	144,993	27,944	75,697	30,341
1912 ...	38 ¹	528	103	278	312	1,221	148,538	25,902	78,576	27,522
1913 ...	33	544	95	267	299	1,205	153,966	19,362	159,445	26,069
1914 ...	33	550	95	258	290	1,193	153,686	13,142	223,098	19,056
1915 ...	31	570	92	254	279	1,195	170,675	10,309	190,739	24,956

1. Including also particulars of four municipalities which were dissolved during the year. 2. Approximate only.

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 is divided into municipal districts, 49 rural and 2 city, each rural district being under the control of a warden and councillors, and 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 1915 as to length of roads and number of bridges and culverts under the control of the municipalities:—

TASMANIA.—ROADS AND BRIDGES IN MUNICIPALITIES, 1915.

Roads.			Bridges.	Culverts.
Macadamised or Gravelled.	Other.	Total.		
Miles. 5,610	Miles. 5,482	Miles. 11,092	No. 1,120*	No. 19,702*

* Last available figures.

(ii.) *Revenue and Expenditure*. The following table gives particulars for the year 1915 of the revenue and expenditure of municipal councils in respect of roads and bridges:—

TASMANIA.—ROADS AND BRIDGES, REVENUE AND EXPENDITURE, 1915.

Revenue.				Expenditure.
From Government.	Rates.	All other. ¹	Total.	
£ 14,651	£ 55,005	£ 164,732	£ 234,388	£ 199,867

1. Including current receipts from loans. 2. Municipal "Works and Services."

§ 2. Railways.

(A) General.

1. *Introduction*.—In the issues of the Commonwealth Year Book, Nos. 1-7, the statistics of all Government Railway systems were treated under the head of *Government Railways*. In the following issues, Nos. 8 and 9, the greater part of those statistics relating to State-owned lines was dealt with separately from those under the control of the Commonwealth Government. This arrangement is continued in the present issue. The State railways are referred to throughout as "State" and the Commonwealth railways as "Federal" railways. There is, however, a summary of the working of the Federal and States' railways in section (E) hereof.

2. *Railway Statistics*.—In some of the earlier issues of the Year Book will be found a condensation of the report issued in 1909 by the Commonwealth Statistician to the Minister for Home Affairs on the subject of *The Desirability of Improved Statistics of Government Railways in Australia* (see Year Book No. 7, page 598).

3. *Railway Communication in the Commonwealth*.—An account of the progress in railway construction in Australia since the opening of the first line in 1854 will be found in Year Book No. 6, p. 681. In the eastern, south-eastern, and southern parts of Australia there now exists a considerable network of railway lines converging from the various agricultural, pastoral and mining districts towards the principal

ports, which are themselves connected by systems of lines roughly running parallel to the coast. These are shewn on the map on page 645. 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 four 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, meeting the main line from Melbourne on the border of South Australia and Victoria. The main interstate line (indicated by a heavier line in the map), which permits of direct communication between the four capital cities—Brisbane, Sydney, Melbourne, and Adelaide—covers a distance from end to end of 1781 miles. This journey occupies three days, two hours and thirty minutes. In the opposite direction the journey occupies three days, three hours and twenty minutes. Both of these are the times taken over all. The distances and the times occupied between the capitals and the duration of stops at Sydney and Melbourne are as follows:—

From—	To—	Distance.	Time (Actual).	Stops at—	
				Sydney.	Melbourne.
		Miles.	h. m.	h. m.	h. m.
Brisbane ...	Sydney ...	715 $\frac{3}{4}$	26 0	9 55	...
Sydney ...	Melbourne ...	582 $\frac{1}{4}$	16 51	...	3 39
Melbourne ...	Adelaide ...	482 $\frac{3}{4}$	17 55	...	...
Brisbane ...	Adelaide ...	1,781	60 46	9 55	3 39
Adelaide ...	Melbourne ...	482 $\frac{3}{4}$	16 59	...	7 1
Melbourne ...	Sydney ...	582 $\frac{1}{4}$	17 10	8 40	...
Sydney ...	Brisbane ...	715 $\frac{3}{4}$	25 40	...	...
Adelaide ...	Brisbane ...	1,781	59 49	8 40	7 1

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 3294 miles. In Western Australia there is a connected system of main or trunk lines between the ports of the State and the agricultural, pastoral, and mining districts.

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

4. **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. 8 $\frac{1}{2}$ -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 the 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 requiring conveyance into New South Wales or *vice versa* have to be transhipped at the boundary between the two States. In June, 1914, however, the Queensland Government purchased two short lengths of line laid on a 2-ft. gauge. 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 has a uniform gauge throughout. In 1870, however, on the grounds of economy, the 3-ft. 6-in. gauge was introduced and many of the lines in South Australia have been constructed with that gauge. At the 30th June, 1916, of the 2181½ miles of State Government railways in that State 1208½ miles were of 3-ft. 6-in. gauge, exclusive of 478 miles from Port Augusta to Oodnadatta belonging to the Federal Government. In the Northern Territory the line from Darwin to Pine Creek is of 3-ft. 6-in. gauge. 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.

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

The effect of the east to west transcontinental railway, which is now under construction by the Commonwealth Government and to which reference is made in (B) hereof, will be that Western Australia will also be linked to the other States, and an unbroken line of communication established from one end of the continent to the other. The construction, moreover, of lines recently decided upon, connecting Victoria with the Riverina district in New South Wales and with the wheat-growing districts of South Australia, will undoubtedly facilitate interstate exchange and will allow the produce of inland areas to find its natural outlet at the nearest port.

6. 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, are becoming more serious as the volume of business increases. As an indication

of the extra cost thus involved, the junction charges on interstate traffic between New South Wales and Victoria range from 1s. 6d. to 2s. 6d. per ton.

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

The first question that naturally arises in considering the problem is as to which gauge should be adopted as the universal gauge of the Commonwealth. As regards Government railways only, the New South Wales gauge has a mileage of 4188 (4148 of 4-ft. 8½-in. gauge and 40 of 3-ft. 6-in. gauge); Victoria and South Australia have a combined mileage of 4955 of 5-ft. 3-in. gauge; while New South Wales, Queensland, South Australia, Western Australia, and the Northern Territory have together 10,143 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 gauges, the advantage of reducing the broad gauge to the 4-ft. 8½-in. gauge is that there would be no necessity for the alteration of tunnels, cuttings, bridges, or viaducts.

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

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

In May 1915 another Premiers' Conference took place at Sydney, and the uniform gauge question again received consideration, with the result that the following resolution was carried without dissent:—"That . . . two leading railway experts, preferably

from outside Australia, should be forthwith appointed by the Government of the Commonwealth and the mainland States to . . . report on—(1) the need of a uniform gauge, (2) the most suitable gauge, (3) the best method of carrying out uniformity, (4) what benefits would result to the Commonwealth and to the States, and (5) the probable cost."

In May 1916 a Premiers' Conference took place at Adelaide, when the question of the adoption of a third rail was discussed, with the result that a motion was carried in the following terms:—"That this Conference agrees to the appointment of a committee of experts, one from each State and the Commonwealth, to investigate the whole question of the laying of a third rail." A further motion was carried to the effect—"That on the receipt of the report of the committee of experts there should be an early meeting of Commonwealth and State Ministers controlling railways to consider the advisability of an early practical application of the third rail system on some selected section."

7. **Loading Gauges.**—Allied to the question of the gauges of the railways of Australia is that of the loading gauges which are in use, the loading gauge being the maximum dimensions to which the rolling stock may be constructed. In the following tables will be found particulars of the loading gauges at present in use on the Government railways, State and Federal:—

LOADING GAUGES IN USE ON STATE AND FEDERAL GOVERNMENT RAILWAYS.
PASSENGER ROLLING STOCK.

Railway.	Gauge.	Maximum—				Tare.
		Width.	Height ab'v'e Rail Level.	Length over all.	T. c. q.	
New South Wales ...	4 8½	9 7¼	13 10½	74 4½	44 2 1	
Victoria ...	5 3	9 11½	14 0½	74 1½	46 17 2	
" ...	2 6	7 0½	10 4½	31 8	8 11 0	
Queensland ...	3 6	9 4	12 9	53 5	26 14 0	
" ...	2 0	6 3½	10 0	22 0	3 0 0	
South Australia ...	5 3	10 4½	14 1½	74 1½	37 11 2	
" ...	3 6	9 4½	12 1	62 6	24 18 0	
Western Australia ...	3 6	8 10	12 7	60 9	31 10 0	
Tasmania ...	3 6	9 6	12 5	64 0	30 0 0	
" ...	2 0	6 6	10 0	30 2	5 10 1	
Federal ...	4 8½	10 6	14 6	75 0	58 0 0	

GOODS ROLLING STOCK.

Railway.	Gauge.	Maximum—				
		Width.	Height ab'v'e Rail Level.	Length over all.	Tare.	Carrying Capacity.
New South Wales ...	4 8½	9 8	13 6	60 11	20 10 3	40 0 0
Victoria ...	5 3	9 7½	13 5	55 4½	20 6 0	30 0 0
" ...	2 6	6 5½	9 7½	27 3½	7 12 2½	10 0 0
Queensland ...	3 6	8 0	12 0	45 5	11 10 0	21 8 0
" ...	2 0	6 6	9 0	22 0	4 10 0	16 0 0
South Australia ...	5 3	10 0½	12 10½	43 6	16 0 0	30 0 0
" ...	3 6	8 6	12 1	38 9	11 15 0	25 0 0
Western Australia ...	3 6	8 8	12 6	44 9	17 18 0	25 0 0
Tasmania ...	3 6	8 10	11 6	40 10	12 5 2	30 0 0
" ...	2 0	6 6	6 6	27 0	5 15 2	20 0 0
Federal ...	4 8½	10 6	14 6	45 0	15 0 0	40 0 0

In the above tables the dimensions given are not necessarily those of one particular vehicle, but are the greatest employed on any vehicle.

8. 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 *F. Private Railways*, hereinafter.)

Mileage of Government and Private Lines, 1855 to 1916. The subjoined table shews the mileage of Commonwealth Government, State Government, and private lines open for traffic (exclusive of sidings and cross-overs) in each State at different periods since the inauguration of railways in Australia in 1854 up to the year 1916. The railway mileage given for each State includes both Commonwealth and State Government railways in that State, and in this table and in those on the following page, is estimated from the geographic point of view and not from that of ownership. The figures from 1855 to 1881 are given to the end of the calendar year; later figures are 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 1916.

Year.	N.S.W.	Vict.	Q'land.	S. Aust.	W. Aust.	Tas.	N. Ter.	C'with.
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
1855	14	2 $\frac{1}{2}$	...	16 $\frac{1}{2}$	...	...	...	23 $\frac{1}{2}$
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	2656	2425	145	10,123
1900-1... ..	2,926	3,238	2,904	1,736	1,984	2618	145	13,551
1910-11	4,027	3,574	4,390	1,993	3,208	675	145	18,012
1912-13	4,197	3,698	4,936	2,202	3,827 $\frac{1}{2}$	729	145	19,734 $\frac{1}{2}$
1913-14	4,251	3,886	5,213	2,357	3,910	766 $\frac{1}{2}$	146	20,529 $\frac{1}{2}$
1914-15	4,444	3,986 $\frac{1}{2}$	5,449 $\frac{1}{2}$	2,955	4,553	779 $\frac{1}{2}$	146	22,263 $\frac{1}{2}$
1915-16	4,496 $\frac{1}{2}$	4,152 $\frac{1}{2}$	6,452 $\frac{1}{2}$	3,060 $\frac{1}{2}$	4,707 $\frac{1}{2}$	758 $\frac{1}{2}$	146	23,773 $\frac{1}{2}$

1. To the 31st December. The line between Goolwa and Port Elliot was opened in 1854 as a horse tramway, but now forms part of the railway system. 2. To the 31st December, 1891. 3. 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. A great 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 446 miles respectively. Since June, 1911, the average annual length opened for traffic has been 1153 miles.

9. Comparative Mileage of Government and Private Lines, 1916.—The subjoined table shews for each State (a) the length of lines owned by the State Government, and by the Commonwealth Government in that State, 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 Government lines are to the 30th June, 1916; those given for private lines are as nearly as possible to the 31st December, 1915:—

GOVERNMENT AND PRIVATE RAILWAYS—COMPARATIVE MILEAGE OF GOVERNMENT LINES, OF PRIVATE LINES AVAILABLE FOR GENERAL TRAFFIC, AND OF PRIVATE LINES NOT SO AVAILABLE, 1915-16.

State or Territory.	Government 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	14,193.01	179.75	4,372.76	124.00	4,496.76
Victoria...	4,100.40	26.00	4,126.40	26.00	4,152.40
Queensland ...	4,966.92	4651.75	5,618.67	*833.75	6,452.42
South Australia ...	23,026.31	...	3,026.31	34.00	3,060.31
Western Australia	23,743.18	277.00	4,020.18	687.50	4,707.68
Tasmania ...	562.25	163.50	725.75	32.50	758.25
Northern Territory	146.00	...	146.00	...	146.00
Total ...	20,738.07	1,298.00	22,036.07	1,737.75	23,773.82

1. Including the Queanbeyan-Canberra Line (5 miles). 2. Including the Port Augusta-Oodnadatta Line (478 miles), and Kalgoorlie-Port Augusta Line (361.75 miles). 3. Including the Kalgoorlie-Port Augusta Line (411.25 miles). 4. The figures differ from those published in Transportation Bulletin No. 9, as they are based on a later return.

10. **Comparative Railway Facilities in Different States, 1916.**—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, 1916, are shown in the subjoined statement for each State and also for the Commonwealth :—

GOVERNMENT AND PRIVATE RAILWAYS.—COMPARISON OF RAILWAY FACILITIES IN DIFFERENT STATES, 1916.

State or Territory.	Population, 30th June, 1916.	Area.	Per Mile of Line Open.	
			Population.	Area.
	Number.	Sq. miles.	Number.	Sq. miles.
New South Wales ¹ ...	1,867,809	310,372	415	69.02
Victoria ...	1,407,648	87,884	339	21.16
Queensland ...	678,628	670,500	105	103.91
South Australia ...	431,892	380,070	141	124.19
Western Australia ...	314,687	975,920	67	207.30
Tasmania ...	197,497	26,215	260	34.57
Northern Territory ...	4,846	523,620	33	3,586.44
Total ...	4,903,007	2,974,581	206	125.12

1. Including Federal Territory.

11. **Classification of Lines according to Gauge, 1915-16.**—The subjoined tables show the total mileage, exclusive of sidings and cross-overs, of (i.) Commonwealth Government railways, given in the State in which situated; (ii.) State Government railways; (iii.) Private railways open to the public for general traffic; and (iv.) Private lines used for special purposes, classified according to gauge. Particulars of Government railways are up to 30th June, 1916, of private railways open for general traffic to the 31st December, 1915, and of private railways open for special purposes to the 31st December, 1915, as nearly as possible.

**GOVERNMENT AND PRIVATE RAILWAYS.—CLASSIFICATION ACCORDING
TO GAUGE, 1915-16.**

State or Territory in which situated.	Mileage having a Gauge of—						Total.
	5 ft. 3 in.	4 ft. 8½ in.	3 ft. 6 in.	3 ft. 0 in.	2 ft. 6 in.	2 ft. 0 in.	
FEDERAL RAILWAYS.							
South Australia ...	Miles. ...	Miles. 361.75	Miles. 478.00	Miles. ...	Miles. ...	Miles. ...	Miles. 839.75
Western Australia ...	...	411.25	...	...	...	...	411.25
Northern Territory ...	...	...	146.00	...	...	...	146.00
Federal Territory ...	...	5.00	...	...	...	...	5.00
Total ...	...	778.00	624.00	...	...	...	1,402.00
STATE RAILWAYS.							
New South Wales ...	...	4,147.92	40.09	...	...	...	4,188.01
Victoria ...	3,978.50	...	...	...	121.90	...	4,100.40
Queensland ...	...	...	4,937.57	...	...	29.35	4,966.92
South Australia ...	976.94	...	1,209.62	...	...	...	2,186.56
Western Australia ...	...	...	3,331.93	...	...	...	3,331.93
Tasmania ...	...	...	537.75	...	...	24.50	562.25
Total ...	4,955.44	4,147.92	10,056.96	...	121.90	53.85	19,336.07
PRIVATE RAILWAYS OPEN FOR GENERAL TRAFFIC.							
New South Wales ...	45.00	72.50	36.00	...	...	26.25	179.75
Victoria ...	14.00	...	...	12.00	...	...	26.00
Queensland ...	...	...	408.25	...	7.00	236.50	651.75
South Australia ...	...	...	...	...	...	...	...
Western Australia ...	...	...	277.00	...	...	...	277.00
Tasmania ...	...	...	153.50	...	...	10.00	163.50
Total ...	59.00	72.50	874.75	12.00	7.00	272.75	1,298.00
PRIVATE RAILWAYS OPEN FOR SPECIAL PURPOSES.							
New South Wales ...	...	120.50	3.50	...	...	...	124.00
Victoria ...	26.00	...	...	...	...	...	26.00
Queensland ...	...	...	174.00	...	10.00	649.75	833.75
South Australia ...	...	...	34.00	...	...	...	34.00
Western Australia ...	...	...	616.50	...	...	71.00	687.50
Tasmania ...	...	...	30.00	...	...	2.50	32.50
Total ...	26.00	120.50	858.00	...	10.00	723.25	1,737.75
ALL RAILWAYS.							
New South Wales ...	45.00	4,340.92	79.59	...	...	26.25	4,491.76
Victoria ...	4,018.50	...	...	12.00	121.90	...	4,152.40
Queensland ...	...	...	5,519.82	...	17.00	915.60	6,452.42
South Australia ...	976.94	361.75	1,721.62	...	...	...	3,060.31
Western Australia ...	...	411.25	4,225.43	...	...	71.00	4,707.68
Tasmania ...	...	...	721.25	...	...	37.00	758.25
Northern Territory ...	...	...	146.00	...	...	...	146.00
Federal Territory ...	...	5.00	...	...	...	...	5.00
GRAND TOTAL ...	5,040.44	5,118.92	12,413.71	12.00	138.90	1,049.85	23,773.82

1. Including 23 miles of 1-ft. 8-in. gauge.

(B) Federal Railways.

1. **General.**—On the 1st January, 1911, the Commonwealth Government took over the Northern Territory from the South Australian Government, and at the same time the railways from Darwin to Pine Creek, in the Northern Territory, and from Port Augusta to Oodnadatta, in South Australia, came under its control. Subsequently, the construction of a transcontinental line from Port Augusta, in South Australia, to Kalgoorlie, in Western Australia, was undertaken by the Commonwealth Government, while a line has been constructed in the Federal Territory, connecting Canberra with the New South Wales railway system at Queanbeyan.

2. **Darwin to Pine Creek Railway.**—This line at first came under the jurisdiction of the Department of External Affairs, and was worked under the Administrator of the Northern Territory. On the 1st July, 1915, the management of the line was handed over to the Commonwealth Railway Department.

Particulars as to the working of this line prior to its passing under the control of the Commonwealth Government will be found in section (C) State Government Railways.

In the Northern Territory Acceptance Act, the construction of a transcontinental line from South Australia is provided for. The extension of the line from Pine Creek to Katherine River is now under construction, while the connecting line from Katherine River to Oodnadatta is in course of survey.

3. **Port Augusta to Oodnadatta Line.**—This line was taken over by the Commonwealth Government from 1st January, 1911, but was held under lease by the South Australian Government until 31st December, 1913. It is provided in the Northern Territory Acceptance Act that the Commonwealth shall annually reimburse the State with the interest payable on the amount of loans raised by the State for the purpose of constructing the railway, and the agreement for working the line prescribes that the Commonwealth is responsible to the State for any financial loss incurred by the State in the working and management of the railway, but is entitled to receive from the State any profit made in such working and management.

4. **Port Augusta-Kalgoorlie Line.**—The Transcontinental Railway Bill, passed in 1907 by the Federal Houses of Parliament, provided for the expenditure of a sum of £20,000 for a preliminary survey of a railway line connecting Western Australia with the eastern States. This survey was commenced in 1908, and was completed in March, 1909. The route of the preliminary survey may be seen on reference to the map on page 645 hereof; the route *via* Tarcoola was, for several reasons, chosen in preference to that *via* Gawler Range and Fowler's Bay. The estimated cost of construction and equipment of the line on the basis of a 4-ft. 8½-in. gauge, from Port Augusta in South Australia to Kalgoorlie in the Western Australian goldfields, a distance of 1063 miles, was £3,988,000. In September, 1911, a Bill was introduced into the Commonwealth Parliament to authorise the construction of the line, and became law in December following. In South Australia an Act was passed enabling the Commonwealth to acquire lands for the railway in South Australia not exceeding one-eighth of a mile wide on either side of the line, but no town lands are to be included at any time. In Western Australia, an Act was also passed by which all necessary lands are to be granted to the Commonwealth for railway purposes. A Railway Construction Department was created by the Federal Government to carry out the work, which was commenced at Port Augusta in September, 1912. A commencement was also made at Kalgoorlie, and it was estimated that the line, which is being built from both ends, and has a gauge of 4-ft. 8½-in., would be completed in three years. The delay in its progress has been caused by the war, difficulties having arisen in obtaining supplies of materials. At the 30th June, 1916, 361.75 miles had been laid in the South Australian division, and 411.25 miles in the Western Australian division. It should be mentioned that owing to deviations from the original route

the length of this line will on completion be about 1053 miles, a saving of about 10 miles. It is reported that the line will be ready for through traffic in November, 1917.

5. **Queanbeyan-Canberra Railway.**—This line was built by the Railway Construction Branch of the Public Works Department, New South Wales, and was completed and taken over by the Chief Commissioner of Railways for that State, who has, for the time being, agreed with the Commonwealth Government to work it. The line was opened for Commonwealth departmental goods traffic on 25th May, 1914.

The Queanbeyan-Canberra railway connects with the New South Wales railway system at Queanbeyan, and is 4 miles 75 chains in length, in addition to which the sidings cover 2½ miles.

6. **Summary of Federal Railways.**—The following table shews the railway lines under the control of the Commonwealth at 30th June, 1916, together with the lines under construction and those which have been or are being surveyed:—

FEDERAL GOVERNMENT RAILWAYS, 30th JUNE, 1916.

Terminals.	Miles.
OPEN FOR TRAFFIC.	
Darwin to Pine Creek (Northern Territory)	146
Port Augusta to Oodnadatta (South Australia)	478
Queanbeyan (New South Wales) to Canberra (Federal Territory)	5
Kalgoorlie to 411 mile	411
Port Augusta to 362 mile	362
Total opened for traffic	1,402
UNDER CONSTRUCTION.	
Kalgoorlie (Western Australia) to Port Augusta (South Australia)	280
Pine Creek to Katherine River (Northern Territory)	54½
Total under construction	334½
SURVEYED OR BEING SURVEYED.	
Katherine River to Mataranka (Northern Territory)	65
Mataranka to Daly Waters (Northern Territory)	95
Kingoonya to Boorthanna (South Australia)	176
Canberra (Federal Territory) to Jervis Bay (New South Wales)	140
Canberra (Federal Territory) to Federal Territory Border in the direction of Yass (New South Wales)	12
Daly Waters (Northern Territory) to Oodnadatta (South Australia)	851
Total surveyed or being surveyed	1,339

7. **Average Miles Worked, Cost of Construction, Revenue, Expenditure, Train Mileage, Number of Passenger Journeys, and Tonnage of Goods and Live Stock carried on Federal Railways.**—In the following table will be found particulars of the average miles worked, cost of construction, revenue, expenditure, train mileage, number of passenger journeys, and tonnage of goods and live stock carried on the Federal lines during the undermentioned periods:—

FEDERAL RAILWAYS.—AVERAGE MILES WORKED, COST OF CONSTRUCTION, REVENUE, EXPENDITURE, TRAIN MILEAGE, NUMBER OF PASSENGER JOURNEYS, AND TONNAGE OF GOODS AND LIVE STOCK, 1911-1916.

KALGOORLIE—PORT AUGUSTA.

Year ended June 30.	Average Miles Open.	Cost of Construction.	Revenue.	Expenditure.	Train Miles run.	No. of Pass. Journeys.	Tonnage of Goods and Live Stock.
		£	£	£			
1915	370	2,846,090	142,159	147,846	497,553	12,234	282,471
1916	668	4,747,062	273,959	273,959	622,919	7,667	248,744

PORT AUGUSTA—OODNADATTA.

1911	³ 239	2,151,309	³ 29,954	³ 33,150	³ 90,031	¹ ...	¹ ...
1912	478	2,151,710	57,939	69,367	214,321	¹ ...	14,071
1913	478	2,153,323	75,869	77,926	281,739	¹ ...	15,302
1914	478	2,153,438	76,317	86,102	296,094	¹ ...	¹ ...
1915	478	2,155,156	66,664	95,871	273,488	¹ ...	¹ ...
1916	478	2,158,355	64,518	95,069	276,690	¹ ...	¹ ...

CANBERRA—QUEANBEYAN.

1915	5	45,486	1,088	1,635	² 6,000	¹ ...	¹ ...
1916	5	47,103	1,040	1,638	1,080	1,079	12,114

DARWIN—PINE CREEK.

1911	³ 72	1,040,734	³ 5,614	³ 5,882	³ 15,046	³ 1,130	³ 935
1912	145	1,040,702	13,267	18,769	30,916	1,791	1,895
1913	145	1,040,702	14,398	17,963	30,683	1,249	2,781
1914	146	1,040,702	17,819	22,991	30,229	2,739	3,615
1915	146	1,040,702	22,143	27,796	39,652	3,857	11,995
1916	146	1,055,754	31,518	47,953	52,424	4,718	30,007

1. Not available. 2. Estimated. 3. For six months only.

8. **Number and Description of Rolling Stock, 1916.**—The following table shows the numbers of locomotives and rolling stock in use on the Federal railways, classified according to gauge :—

CLASSIFICATION OF LOCOMOTIVES AND ROLLING STOCK ON FEDERAL RAILWAYS, 1915-16.

Railway.	Gauge.		Total . . .
	4 ft. 8½ in.	3 ft. 6 in.	
LOCOMOTIVES.			
Kalgoorlie-Port Augusta ...	38	...	38
Port Augusta-Oodnadatta ...	...	¹ ...	...
Canberra-Queanbeyan ...	² ...	...	...
Darwin-Pine Creek ...	...	12	12
Total ...	38	12	50
PASSENGER VEHICLES.			
Kalgoorlie-Port Augusta ...	10	...	10
Port Augusta-Oodnadatta ...	...	¹ ...	...
Canberra-Queanbeyan ...	² ...	...	...
Darwin-Pine Creek ...	...	4	4
Total ...	10	4	14

CLASSIFICATION OF LOCOMOTIVES AND ROLLING STOCK ON FEDERAL RAILWAYS, 1915-16—continued.

Railway.	Gauge.		Total.
	4 ft. 8½ in.	3 ft. 6 in.	
VEHICLES OTHER THAN PASSENGER.			
Kalgoorlie-Port Augusta	686	...	686
Port Augusta-Oodnadatta ... ..	...	32 ¹	32
Canberra-Queanbeyan ... ..	...²	...	...
Darwin-Pine Creek ... ..	...	220	220
Total	686	252	938

1. South Australian Government railway locomotives and rolling stock used. 2. New South Wales Government railway locomotives and rolling stock used.

9. **Number of Railway Employees.**—The following table shews the number of employees on the Federal railways at 30th June, 1916, classified according to (a) salaried staff, and (b) wages staff.

FEDERAL RAILWAYS.—NUMBER OF EMPLOYEES ON RAILWAYS, 1915-16.

Railway.	1915-16.	
	Salaried Staff.	Wages Staff.
Kalgoorlie-Port Augusta	82	873
Port Augusta-Oodnadatta ... ..	...¹	... ¹
Canberra-Queanbeyan ... ..	...²	... ²
Darwin-Pine Creek	11	129
Total	93	1,002

1. Worked by South Australian Government railways. 2. Worked by New South Wales Government railways.

10. **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 since the 1st January, 1911, on the Federal railways:—

FEDERAL RAILWAYS.—TOTAL NUMBER OF PERSONS KILLED AND INJURED ON FEDERAL RAILWAYS, 1911-1916.

Railway.	1911. ¹		1911-12.		1912-13.		1913-14.		1914-15.		1915-16.	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
Kalgoorlie-Port Augusta ... ..	...	...	...	...	...	...	2	3	13	34	1	16
Port Augusta-Oodnadatta	1	1	...	1	...	2	...	13	2	2	...	6
Canberra-Queanbeyan ... ..	...	...	...	...	...	...	...	...	...	...	...	...
Darwin-Pine Creek ... ..	...	1	...	...	...	...	...	...	...	...	1	1
Total	1	2	...	1	...	2	2	16	15	36	2	23

1. To 30th June.

(c) State Railways.

1. Mileage Open, 1901 to 1916.—The following table shows the length of State railways open for traffic on the 30th June in the years 1901-2 and 1911-16:—

STATE RAILWAYS.—MILEAGE OPEN FOR TRAFFIC, 1901-2 and 1911-16.

Year.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	N. Ter.	All States.
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
1901-02 ...	3,026	3,302	2,801	1,736	1,360	1,462	145	12,832
1910-11 ...	3,758	3,523	3,868	1,457	2,376	470	3 ...	15,452
1911-12 ...	3,832	3,622	4,123	1,460	2,598	496	...	16,131
1912-13 ...	3,930	3,647	4,381	1,690	2,854	507	...	17,009
1913-14 ...	3,967	3,835	4,570	1,845	2,967	519	...	17,703
1914-15 ...	4,134	3,875	4,838	2,157	3,332	533	...	18,869
1915-16 ...	4,188	4,100	4,967	2,187	3,332	562	...	19,336

1. To the 31st December, 1902. 2. Including the mileage (478) of the Port Augusta to Oodnadatta line (see page 627). 3. Taken over by Commonwealth Government, 1st January, 1911 (see page 627).

The following statement shows the actual mileage opened for traffic in the year 1915-16, and also the annual average increase in mileage opened since 1906 in each State:—

STATE RAILWAYS.—MILEAGE OPENED ANNUALLY.

Mileage.	N.S.W.	Vic.	Qld.	S.A.	W.A.	Tas.	Total all States.
Mileage opened during 1915-16 ...	54½	225½	129	29½	—	29	467½
Average annual mileage increase in 10 years to 30th June, 1916 ...	80	70	183	92	172	10	607

(i.) *New South Wales.* During the year ended 30th June, 1916, the following lines were opened for traffic:—Raleigh to Coff's Harbour (13½ miles); Glenreagh to South Grafton (27½ miles); Campsie to Flemington (5½ miles); Flemington Goods Loop (1 mile); Glebe Island to Wardell Road (4½ miles); and increases by deviations (3 miles), making a total of 54½ miles.

(ii.) *Victoria.* The following lines were opened for traffic during 1915-16:—Murrayville to Pinnaroo (12½ miles); Hamilton to Cavendish (15½ miles); Elmore to Cohuna (57½ miles); Linton to Skipton (12½ miles); Bairnsdale to Orbost (60½ miles); Tallangatta to Shelley (22½ miles); Heywood to Dartmoor (26 miles); and Lorquon to Yanac-a-Yanac (18½ miles); a total of 225½ miles.

(iii.) *Queensland.* The increase of 129 miles in the mileage opened for traffic in 1915-16 was due to the opening of the following lines:—Logan Village to Canungra (21 miles); Drayton Deviation, near Toowoomba (10 miles); Oakley to Mount Russell (19 miles); Kingaroy to Tarong (18 miles); Enoggera to Rifle Range (1 mile); Mumbilla to Kalbar (6 miles); Yaamba to Kunwarara (22 miles); Sarina to Koumala (13 miles); Duchess to Butru (14 miles); and Malanda to Jaggan (5 miles).

(iv.) *South Australia.* The lines opened for traffic in this State during the year 1915-16 were on the 3-ft. 6-in. gauge, from Booleroo Centre to Wilmington (22½ miles); and on the 5-ft. 3-in. gauge, from Pinnaroo to Victorian Border (3½ miles); Outer Harbour Railway Extension (1 mile)—a total of 27½ miles. There were also alterations and extensions of existing lines which amounted to a net increase of 2½ miles in length.

By the transfer on 1st January, 1911, 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, however, was leased to the State by the Commonwealth Government until 31st December, 1913, since which date it has been worked on behalf of the Commonwealth under agreement. (See page 627.)

(v.) *Western Australia.* In the year 1915-16 no new lines were opened for traffic. This is the first year since 1901 in which no new mileage has come into operation.

(vi.) *Tasmania.* During the year 1915-16 the following lines were opened for traffic, Ulverstone Junction to Nietta (21½ miles), and Don Junction to Palcoona (8 miles), a total of 29½ miles.

2. Average Mileage Worked, Train Miles Run, Number of Passenger Journeys, and Tonnage of Goods and Live Stock Carried, on State Government Railways.—The table at head of page 631 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 1911-16 inclusive:—

STATE RAILWAYS.—AVERAGE MILEAGE WORKED, TRAIN MILES RUN, NUMBER OF PASSENGER JOURNEYS, AND TONNAGE OF GOODS AND LIVE STOCK CARRIED, 1901-2 and 1911-16.

Year.	N.S.W.	Victoria.	Q'land.	Sth. Aust.	West. Aust.	Tasmania.	N. Ter.	All States.
AVERAGE MILEAGE WORKED.								
1901-2	2,953	3,265	2,801	1,736	1,356	5 468	145	12,724
1911-12	3,799	3,543	3 4,144	1,460	2,471	503	7 ...	15,920
1912-13	3,872	3,639	3 4,351	1,534	2,783	508	...	16,687
1913-14	3,959	3,747	4,507	1,815	2,910	525	...	17,463
1914-15	4,057	3,948	4,730	2,026	3,096	536	...	18,293
1915-16	4,169	3,955	4,939	2,185	3,332	552	...	19,132

TRAIN MILES RUN.								
1901-2	11,649,059	11,284,944	5,666,058	4,196,138	4,507,919	5 902,918	30,275	38,237,311
1911-12	18,521,320	13,836,375	10,327,237	6,029,151	5,227,511	1,046,479	7 ...	54,987,873
1912-13	19,184,247	14,234,550	11,464,084	6,342,871	5,623,132	1,006,508	...	57,855,392
1913-14	20,549,635	15,028,649	11,346,334	6,721,284	5,565,062	1,000,740	...	60,221,764
1914-15	20,420,023	15,303,209	11,985,521	5,580,679	5,404,814	1,005,145	...	59,702,391
1915-16	21,556,034	13,826,538	11,571,746	5,630,964	5,149,289	1,051,511	...	58,786,102

NUMBER OF PASSENGER JOURNEYS.								
1901-2	30,885,214	57,465,077	1 8,421,258	9,643,058	8,158,299	5 761,345	3,755	115,338,006
1911-12	79,706,728	104,234,732	17,080,756	18,353,054	16,390,261	1,715,464	7 ...	228,480,995
1912-13	79,490,012	111,513,908	19,999,072	19,382,330	17,920,096	1,649,539	...	249,854,937
1913-14	86,328,421	116,611,448	22,252,476	19,809,533	19,208,420	1,708,334	...	265,918,632
1914-15	88,774,451	117,259,926	24,257,552	18,331,273	18,635,327	1,750,905	...	269,509,434
1915-16	92,850,838	115,771,238	24,433,905	20,512,753	18,884,541	2,078,228	...	274,536,503

TONNAGE OF GOODS AND LIVE STOCK CARRIED.								
1901-2	6,467,552	3,433,627	1,881,570	1,392,257	1,888,146	5 6 407,505	2,436	415,473,093
1911-12	10,910,553	5,297,685	3,493,727	2,781,720	2,542,087	469,855	7 ...	25,495,627
1912-13	11,666,250	5,150,404	3,797,581	3,016,039	2,866,241	464,934	...	26,961,449
1913-14	13,245,842	5,816,088	4,301,410	3,103,471	3,170,144	408,864	...	30,045,819
1914-15	11,920,881	5,410,045	4,970,873	3,076,280	2,523,859	408,069	...	27,310,007
1915-16	11,915,500	5,829,835	4,570,833	2,396,933	2,554,858	388,781	...	27,656,795

¹ These figures are partly estimated, the actual returns excluding journeys by season ticket holders. ² Exclusive of the Port Augusta-Oodnadatta line (478 miles) as from the 1st January, 1911. ³ Including the Etheridge railway 143 miles in length. ⁴ Exclusive of live stock returns for Tasmania. ⁵ For the calendar year 1902. The average mileage worked is greater than the actual mileage open, owing to the fact that the Government railways have running powers over certain private lines. ⁶ Exclusive of live stock. ⁷ Taken over by Commonwealth Government, 1st January, 1911 (see page 631).

3. 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 645 hereinafter. In all the States the Government railways are grouped, for the convenience of administration and management, into several divisions or systems, some of which have already been briefly referred to above in dealing with the history of construction of the railways. The subjoined summary shews concisely the gauge and length of the main and branch lines included in each division or system of the different States of the Commonwealth for the year ended the 30th June, 1916:—

STATE RAILWAYS, 1915-16.

Particulars.	Length, including Suburban Lines, and Gauge.		Suburban. (a)
	4 ft. 8½ in.	3 ft. 6 in.	4ft.8½ in
1. NEW SOUTH WALES.			
	Miles.	Miles.	Miles.
(i.) The Northern line and branches—			
(a) Main line. Strathfield-Wallangarra ...	488.48	...	98.84
(b) Branch lines ...	583.94	...	5.21
(ii.) The North Coast line and branches—			
(a) Main line. West Maitland-Murwillumbah ...	352.56	...	12.85
(b) Branch lines ...	17.89	...	...
(iii.) The Western line and branches—			
(a) Main line. Sydney-Bourke ...	508.79	...	34.25
(b) Branch lines ...	858.90	...	24.58
(iv.) The Southern line—			
(a) Main line. Granville-River Murray ...	386.25	...	20.69
(b) Branch lines ...	845.00	...	...
(v.) The South-coast (Illawarra) line—			
(a) Main line. Sydney to Nowra ...	94.94	...	34.23
(b) Branch lines ...	11.17	...	9.99
(vi.) Broken Hill line. Broken Hill-Tarrawingee ...	...	40.09	...
	4,147.92	40.09	240.64
		4,147.92	
Total all lines ...		4,188.01	
(a) Including lines 34 miles from Sydney and Newcastle respectively, and the Richmond line.			

2. VICTORIA.			
	5 ft. 3 in.	2 ft. 6 in.	(b) 5 ft. 3 in.
(i.) The South-eastern system—			
(a) Main lines. Dandenong-Port Albert ...	117.27	...	...
Caulfield-Stony Point ...	38.72	...	13.50
(b) Branch lines ...	47.49	3.23	...
(ii.) The Eastern system—			
(a) Main lines. South Yarra-Sale ...	125.27	...	16.00
Traralgon-Orbost ...	132.12	...	...
(b) Branch lines ...	66.67	26.06	1.60
(iii.) The North-eastern system—			
(a) Main line. Essendon Junc.-River Murray ...	187.44	...	14.75
(b) Branch lines ...	560.98	30.49	1.50
(iv.) The Northern system—			
(a) Main line. Melbourne-Echuca ...	156.00	...	20.25
(b) Branch lines ...	491.77	...	...
(v.) The Midland system—			
(a) Maryborough-Merbein ...	246.49	...	...
(b) Branch lines ...	337.85	...	...
(vi.) The Western and South-western systems—			
(a) Main lines. Sunshine-Warrenheip ...	61.95	...	10.75
Newport-Port Fairy ...	180.24	...	13.00
N. Geelong Junc.-Serviceton ...	267.57	...	...
(b) Branch lines ...	798.79	43.90	...
(vii.) Metropolitan District—			
(a) Richmond-Healesville ...	37.27	...	17.00
(b) Branch lines ...	41.15	18.22	12.99
(c) Princes Bridge-Hurst Bridge ...	22.70	...	19.50
(d) Whittlesea Junction-Whittlesea ...	22.07	...	16.25
(e) Suburban lines—Port Melbourne, St. Kilda, Sandringham, Burnley-Darling, Deepdene-Burwood, Fawkner, Williamstown, etc....	38.69	...	38.69
	3,978.50	121.90	195.78
		3,978.50	
Total all lines ...		4,100.40	

(b) Within 20 miles of Melbourne.

STATE RAILWAYS—Continued.

Particulars.	Length, including Suburban Lines, and Gauge.		Suburban
	3 ft. 6 in.	2 ft. 0 in.	3 ft. 6 in.
3. QUEENSLAND.	Miles.	Miles.	Miles.
(i.) The Southern division—			
(a) South-coast line. Yeerongpilly to Tweed Heads	68.13	...	(a) 19.93
(b) South Metropolitan lines and branches	78.86	...	28.09
(c) Main line. Brisbane to Toowoomba	102.20	...	(b) 24.09
(d) Branch lines	170.07	...	...
(e) Southern line. Toowoomba to Wallangarra	122.70	...	...
(f) Branch lines	113.70	...	...
(g) South-western line. Warwick to Dirranbandi	256.44	...	...
(h) Western line. Toowoomba to Cunnamulla	503.12	...	...
(i) Branch lines	332.28	...	...
(j) Nth.-coast line. Northgate Junction to Gympie	161.59	...	(c) 10.95
(k) Croydon Junction to 235 miles 14 chains	70.42	...	...
(l) Branch lines	419.32	...	...
(m) Suburban lines	24.43	...	24.43
(ii.) The Central division—			
(a) North Coast line. 235 miles 14 chains to Rockhampton	160.58	...	...
(b) Central line. Rockhampton to Longreach	424.54	...	...
(c) Branch lines	490.46	...	...
(iii.) The Northern division—			
(a) Mackay line (including Branches)	96.73	...	...
(b) Bowen line	65.32	...	...
(c) Great Nthn. Railway. Townsville to Cloncurry	479.98	...	...
Branch lines	403.62	...	...
(d) Geraldton and Mourilyan Tramway	...	29.35	...
(e) Cairns line. Cairns to Tumoulin	99.96	...	...
Branch lines	66.48	...	...
(f) Cooktown line. Cooktown to Laura	68.33	...	...
(g) Normanton line. Normanton to Croydon	95.96	...	...
(h) Mount Mulligan line	29.80	...	...
(i) Mount Garnet line	32.55	...	...
	4,937.57	29.35	107.49
Total all lines		4,966.92	
(a) To Beenleigh.	(b) To Ipswich.	(c) To Petrie.	
4. SOUTH AUSTRALIA.	5 ft. 3 in. Miles.	3 ft. 6 in. Miles.	5 ft. 3 in. (a)
(i.) Midland system—			
(a) Main line. Adelaide-Terowie	139.81	...	24.51
(b) Branch lines	143.45	...	22.91
(ii.) The Northern system—			
(a) Terowie-Quorn	...	94.41	...
(b) Other lines	5.15	477.81	...
(iii.) The Southern system—			
(a) Main line. Adelaide-Servigeton (near)	194.93	...	23.50
(b) Branch lines	195.46	...	34.28
(iv.) Murray Lands lines	298.14	...	...
(v.) South-eastern system—			
(a) Wolsley-Mount Gambier	...	112.26	...
(b) Branch lines	...	112.73	...
(vi.) Port Broughton line	...	10.01	...
(vii.) Eyre Peninsula system—			
(a) Port Lincoln-Cape Thevenard	...	269.53	...
(b) Branch lines	...	132.87	...
	976.94	1,209.62	105.20
Total all lines	...	2,186.56	...
(a) Within 25 miles of Adelaide.			

STATE RAILWAYS—Continued.

Particulars.	Length including Suburban lines, and Gauge.	
	3 ft. 6 in.	3 ft. 6 in.
5. WESTERN AUSTRALIA.	Miles.	Miles.
(i.) Eastern railway—		
(a) Main line. Fremantle-Northam ...	78.13	23.65
(b) Branch lines	78.34	...
(ii.) South-western railway—		
(a) East Perth-Picton Junction	110.11	18.20
(b) Branch lines	498.80	...
(iii.) Great Southern railway—		
(a) Main line. Spencer's Brook-Albany Jetty	280.05	...
(b) Branch lines	531.46	...
(iv.) Eastern Goldfields railway—		
(a) Main line. Northam-Laverton and Leonora	533.35	...
(b) Branch lines	156.25	...
(v.) East Northern-Mullewa railway—		
(a) Main line	262.86	...
(b) Branch lines	112.59	...
(vi.) Northern railway—		
(a) Main line. Geraldton-Meehatharra ...	333.97	...
(b) Branch lines	207.84	...
(vii.) Hopetoun-Ravensthorpe railway	33.78	...
(viii.) Port Hedland-Marble Bar	114.40	...
Total	3,331.93	41.85

Particulars.	Length, including Suburban Lines, and Gauge.		Suburban (a) 3 ft. 6 in.
	3 ft. 6 in.	2 ft. 0 in.	
6. TASMANIA.	Miles.	Miles.	Miles.
(i.) Main line—			
(a) Hobart-Evandale Junction	124.00	...	10.00
(b) Branch lines	107.50	...	...
(ii.) Western line—			
(a) Launceston to Myalla	135.00	...	...
(b) Branch lines	55.75	...	...
(iii.) North Eastern line—			
(a) Launceston to Branzholm	71.00	...	...
(b) Branch line	0.50	...	...
(iv.) Sorell line	14.50	...	...
(v.) Strahan-Zeehan line	29.50	...	...
(vi.) North-east Dundas tramway ... ..	...	20.25	...
(vii.) Comstock tramway ... ..	...	4.25	...
Total all lines	537.75	24.50	10.00
		537.75	
		562.25	

GRAND TOTAL OF STATE RAILWAYS, 19,936.07 MILES.

(a) Within 10 miles of Hobart.

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

5. Lines under Construction, and Authorised and Proposed Lines, 1916.—The following statement gives particulars up to the 30th June, 1916, of the mileage of State railways (a) under construction, and (b) authorised for construction but not commenced :—

**STATE RAILWAYS.—MILEAGE UNDER CONSTRUCTION AND AUTHORISED,
30th JUNE, 1916.**

Particulars.	N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	All States.
Mileage under construction	1,120.51	136.12	559.00	140.13	234.75	65.06	2255.57
Mileage authorised but not commenced ...	321.26	52.00	1,541.00	12.00	177.50	...	2103.76

¹ For similar statistics of Federal Railways see page 628.

(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, 1916, were those from *Wauchope* to *Kempsey* (30½ miles), *Kempsey* to *Macksville* (30½ miles), *Macksville* to *Raleigh* (20½ miles), and *Coff's Harbour* to *Glenreagh* (26½ miles). These lines, when completed, will form an alternative main route between *Newcastle* and *Brisbane*. Other lines under construction are as follow:—*Glenreagh* to *Dorrigo* (42 miles), *Forbes* to *Stockinbingal* (83½ miles), *Wagga* to *Tumbarumba* (76½ miles), *Condobolin* to *Broken Hill* (360 miles), *Denman* to *Merrilla* (33 miles), *Dunedoo* to *Coonabarabran* (76½ miles), *Wyalong* to *Lake Cudgellico* (70½ miles), *Dubbo* to *Werris Creek* (157½ miles), *Barellan* to *Griffith* (32 miles), *Tullamore* to *Tottenham* (33 miles), *Nimmitabel* to *Bombala* (40 miles), *Sydenham* to *Botany* (6 miles), and *Gosford* to *Gosford Racecourse* (1½ miles). (b) *Victoria.* In this State the following lines were under construction by the Board of Land and Works on the 30th June, 1916:—5-ft. 3-in. gauge: *Dartmoor* to *Mumbannar* (13.48 miles), *Shelley* to *Cudgewa* (19.64 miles), *Cavendish* to *Toolondo* (44 miles), *Neerim South* to *Toorenga River* (14 miles), *Rushworth* to *Stanhope North* (14.25 miles), and *Koo-wee-rup* to *McDonald's Track* (30.75 miles), making in all 136.12 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 1189 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 *Quilpil*, *Emmet*, *Winton*, and *Butru*, in such a manner that they will form junctions with a line to be made running north-westerly from *Eromanga* to *Camooweal*. These extensions, together with the north-westerly line, will make an aggregate distance of 1125 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, 1916, the following lines, of an aggregate length of 559 miles, were under construction:—Enoggera to Terror's Creek (24 miles), Extension beyond Tara (50 miles), Goondoon to Kallia (31 miles), Murgon to Proston (26 miles), Branch to Windera (12 miles), Munbilla to Mount Edwards (from Kalbar) (11 miles), Roma to Orallo (29 miles), Rockhampton to Alton Downs (17 miles), Mount Morgan to Dawson Valley (third section) (25 miles), Malanda to Millaa-Millaa from Jaggan (first section) (5 miles), Tumoulin to Cedar Creek (4 miles), Koolamarra to Mount Cuthbert (28 miles), and Kalkadoon to Dobbyn (15 miles). Of the Great Western Railway the following parts are under construction:—Section A: From Cheepie to Bulloo River (48 miles); Section B: From Emmet to near Welford (32 miles); Section C: From Winton to Elderslie (38 miles); Section D: From Butru towards Sulieman Creek (20 miles). The following parts of the North Coast Railway are under construction:—Section A: Kunwarara to Marlborough (18 miles); Marlborough towards St. Lawrence (23 miles); Section B: Koumala to Carmila Creek (26 miles); Mackay to St. Helens (31 miles); Section D: From Rollingstone to Ingham (34 miles); Section E: From Mooliba to Innisfail (12 miles). (d) *South Australia*. In this State the lines under construction on the 30th June, 1916, were as follow:—Riverton to Spalding (51.25 miles), Salisbury to Long Plains (34.5 miles), Paringa to Renmark (2.5 miles), Balhannah to Mount Pleasant (22 miles), New Palmer to Sedan (20 miles), Nuriootpa to Truro (9.88 miles), 5-ft. 3-in. gauge. (e) In *Western Australia* the following lines were in course of construction by the Public Works Department on the 30th June, 1916:—Wyalkatchem to Mount Marshall (52½ miles), Wagin to Bowelling (62½ miles), Bolgart Extension (34½ miles), Kukerin to Lake Grace (25½ miles), and Esperance northward (60 miles). (f) *Tasmania*. At 30th June, 1916, the following lines were under construction, Branxholm to Moorina (13½ miles), Stanley to Trowatta (25½ miles), Russell to Maydena (10½ miles), and Flowerdale Junction to Preolenna (15½ miles).

(ii.) *Lines Authorised for Construction*. (a) *New South Wales*. At the 30th June, 1916, the following lines had been authorised for construction:—Mirrool to Hillston (62½ miles), Barmedman to Rankin Springs (71 miles), Coonabarabran to Burren Junction (95½ miles), Craboon to Coolah (24 miles), Gilgandra to Collie (24 miles), Canowindra to Eugowra (26¾ miles), Grafton to South Grafton (2½ miles), and Roslyn to Taralga (15¾ miles). (b) In *Victoria* the following lines were authorised, but their construction had not been commenced up to the end of June, 1916:—5-ft. 3-in. gauge: White Cliffs to Yelta (10 miles), Alberton to Won Wron (12.25 miles), Nandaly to Kulwin 19.75 miles, and Bittern to Red Hill (10 miles)—a total of 52 miles. (c) *Queensland*. In addition to the new lines upon which work has been commenced, Parliament has also authorised the construction of the following parts of the Great Western Railway: Section A, from Bulloo River (120 miles); Section B, from near Welford (251 miles); Section C, from Elderslie (324 miles); and Section D, from Carbine Creek (258 miles); and on the North Coast Railway, Section A, from beyond Marlborough to St. Lawrence (37 miles); Section B, from Carmila Creek to St. Lawrence, and St. Helens to Midge Point (32 miles); Section C, from Midge Point to Proserpine (13 miles); Section D, from Ingham to near Cardwell (19 miles); Section E, from Innisfail to near Cardwell (71 miles). The following lines were also authorised for construction: Inglewood to Texas and Silverspur (44 miles), Mount Edwards to Maryvale (28 miles), Lanefield to Rosevale (17 miles), Gatton to Mount Sylvia (11 miles), Juandah to Taroom (42 miles), Dirranbandi extension (52 miles), Mundubbera to the Northern Burnett (32 miles), Malanda to Millaa Millaa—second section—(8 miles), Mount Russell to Cecil Plains (19 miles), Longreach to Winton (110 miles), and Merinda to Bowen Coalfields (53 miles)—a total of 1541 miles. (d) In *South Australia*, Parliament has authorised the construction of a line on the 5-ft. 3-in. gauge from Mount Gambier to the Victorian border, a distance of 12 miles. (e) In *Western Australia* the following lines were authorised for construction up to the 30th June, 1916:—Busselton-Margaret River (37¾ miles), Dwarda-Narrogin (33 miles), Kondinin-Merredin (85 miles), and Nyabing-Pingerup (21¾ miles).

6. **Cost of Construction and Equipment of State Railways.**—The total cost of construction and equipment of the State railways of the Commonwealth at the 30th June, 1916, amounted to £197,158,588, or to an average of £10,196 per mile open for traffic. Particulars as to the capital expenditure incurred in each State on lines open for traffic are given in the following table :—

STATE RAILWAYS.—COST OF CONSTRUCTION AND EQUIPMENT to 30th JUNE, 1916.

State.	Length of Line Open.	Total Cost of Construction and Equipment.	Average Cost per Mile Open.	Cost per Head of Population.
	Miles.	£	£	£
New South Wales	4,188	68,825,592	16,434	36.85
Victoria	4,100	54,391,989	13,266	38.64
Queensland	4,967	34,787,623	7,004	51.26
South Australia	2,187	17,236,543	7,881	39.91
Western Australia	3,332	17,118,195	5,138	54.40
Tasmania	562	4,798,646	8,539	24.30
Total	19,336	197,158,588	10,196	40.25

It will be seen that the lowest average cost per mile open is in Western Australia, and is only £5138, which is less than one-third of the highest average cost, namely, £16,434 in New South Wales, compared with an average of £10,196 for all the State Government railways. In Western Australia there have been comparatively few engineering difficulties to contend with; moreover, the system was adopted in several instances in that State of giving contractors the right to carry traffic during the period of their contracts, with the result that, at least in all goldfields railway contracts, the cost of construction was considerably lessened.

In the above table the figures for Queensland relating to cost of construction and equipment do not agree with those contained in the report of the Railway Commissioner for that State. The amount in the report is given as £36,838,440, which includes discount and flotation charges on loans allocated to railways, but as no other State includes this depreciation of loan capital, it is necessary to exclude it in order to place the cost of railway construction in all States on the same basis.

(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 five 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, 1916, was £3786. In Victoria also the cost of construction has been greatly reduced in recent years. The total cost to the 30th June, 1916, of the narrow gauge (2 ft. 6 in.) lines, having a length of one hundred and twenty-two miles, was only £333,449, which gives an average cost per mile of only £2735. 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 :—

STATE 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 Lines and over.	Single Line.	Total.			
	ft. in.	Miles.	Miles.	Miles.	£	£	
NEW SOUTH WALES—							
Penrith to Bathurst ...	4 8½	72.92	38.13	111.05	4,048,172	36,455	1876
Sydney to Kiama ...	4 8½	39.29	58.40	97.69	4,029,602	41,249	1887
Homebush to Waratah ...	4 8½	95.71	...	95.71	3,538,235	36,967	1889
VICTORIA—							
Melbourne to Bendigo ...	5 3	100.89	...	100.89	4,941,590	48,980	1862
N. Geelong to Ballarat ...	5 3	41.45	11.98	53.43	1,945,780	36,417	1862

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 458.77 miles comprised in the above table was £40,033, whereas the average cost of the 360.06 miles referred to in the next table was £1889.

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

Line.	Gauge.	Length.	Total Cost.	Average Cost per Mile.	Date of Opening.
NEW SOUTH WALES—					
Parkes to Condobolin ...	4 8½	62.75	132,496	2,111	1898
Burren Junction to Collarenebri	4 8½	42.55	104,070	2,446	1906
VICTORIA—					
Wangaratta to Whitfield ...	2 6	30.49	39,869	1,308	1899
Wycheproof to Sealake ...	5 3	47.89	84,802	1,771	1895
Ultima to Chillingollah ...	5 3	20.14	33,858	1,681	1909
QUEENSLAND—					
Dalby to Bell ...	3 6	23.50	38,269	1,628	1906
Mahar to Jandowae ...	3 6	28.24	60,484	2,142	1914
SOUTH AUSTRALIA—					
Wandilo to Glencoe ...	3 6	9.13	11,673	1,279	1904
Cummins to Yeelanna ...	3 6	8.82	16,026	1,816	1909
Tailem Bend to Pinnaroo ...	5 3	86.55	158,719	1,847	1906

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

(ii.) *Capital Cost of Construction and Equipment, Total and per Mile Open.* The increase in the total capital cost of construction and equipment of Government railways in each State for 1901-2 and for each year from 1911 to 1916 is shewn in the following table :—

**STATE RAILWAYS.—CAPITAL COST OF CONSTRUCTION AND EQUIPMENT,
1901-2 and 1911-16.**

TOTAL COST.

Year.	N.S.W.	Victoria.	Q'land.	Sth. Aust.	West. Aust.	Tas.	N. Ter.	All States.
	£	£	£	£	£	£	£	£
1901-2	40,565,073	40,613,734	20,119,143	¹ 12,769,899	7,410,426	² 3,840,747	1,018,700	126,337,772
1911-12	53,139,612	45,543,054	27,751,227	12,810,815	13,233,093	4,253,013	...	156,730,814
1912-13	57,003,036	46,989,111	29,895,220	14,035,437	14,913,128	4,400,392	...	167,236,224
1913-14	60,128,491	49,216,744	31,817,792	15,240,779	15,873,852	4,496,634	...	176,774,232
1914-15	64,008,436	51,518,792	33,405,877	16,597,139	16,980,713	4,628,911	...	187,139,867
1915-16	68,825,592	54,391,989	34,787,623	17,236,543	17,118,195	4,798,646	...	197,158,588

COST PER MILE OPEN.

Year.	£	£	£	£	£	£	£	£
1901-2	13,405	12,300	7,183	¹ 7,428	5,449	² 8,313	7,124	9,860
1911-12	13,867	12,574	6,731	8,766	5,094	8,583	...	9,716
1912-13	14,505	12,884	6,824	8,307	5,225	8,679	...	9,773
1913-14	15,157	12,834	6,962	8,260	5,350	8,664	...	9,986
1914-15	15,483	13,285	6,905	7,695	5,096	8,695	...	9,918
1915-16	16,434	13,266	7,004	7,881	5,138	8,539	...	10,196

1. Including the Port Augusta-Oodnadatta line. 2. To the 31st December, 1902.
3. Transferred to Commonwealth Government, 1st January, 1911 (see page 627).

(iii.) *Loan Expenditure on Railways.* The subjoined table shews the total loan expenditure on Government railways and tramways (including lines both open and unopen) in each State during the financial year 1901-2, and on railways only for the years 1911-12 to 1915-16.

STATE RAILWAYS.—LOAN EXPENDITURE, 1901-2 and 1911-16.

Year.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	All States.
	£	£	£	£	£	£	£
1901-2 ¹	2,243,672	483,325	751,451	121,907	578,985	² 80,948	4,260,288
1911-12	2,850,791	1,703,453	2,854,560	789,143	¹ 1,316,800	¹ 120,179	9,634,926
1912-13	3,614,306	1,231,113	2,066,819	1,207,335	1,948,876	¹ 116,393	10,184,842
1913-14	4,903,328	2,361,660	1,679,482	1,489,168	¹ 1,227,711	¹ 146,055	11,807,404
1914-15	4,394,318	2,809,926	1,739,156	1,285,431	670,209	¹ 228,285	11,127,325
1915-16	4,787,669	2,440,317	2,034,614	929,143	414,026	233,601	10,839,370

1. Including Tramways. 2. For the calendar year 1902.

The following statement shews the total loan expenditure to the 30th June, 1916:—

**STATE RAILWAYS.—TOTAL LOAN EXPENDITURE IN EACH STATE
TO 30th JUNE, 1916.**

State, etc.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	All States.
	£	£	£	£	£	£	£
Expenditure	73,395,819	52,565,155	37,186,119	19,733,005	17,032,886	5,277,983	205,190,967

1. Including Tramways.

7. *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 1911 to 1916 inclusive:—

**STATE RAILWAYS.—GROSS REVENUE, TOTAL, PER AVERAGE MILE WORKED,
AND PER TRAIN MILE RUN, 1901-2 and 1911-16.**

Year.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	N. Ter.	All States.
TOTAL GROSS REVENUE.								
	£	£	£	£	£	£	£	£
1901-2 ...	3,668,686	3,367,843	1,382,179	1,085,175	1,521,429	233,911	12,522	11,271,045
1911-12 ...	6,491,473	5,218,967	3,032,858	2,090,563	1,884,604	312,786	...	19,031,251
1912-13 ...	6,743,965	5,205,442	3,321,672	2,222,436	2,037,853	327,113	...	19,363,501
1913-14 ...	7,742,241	5,560,958	3,660,022	2,337,251	2,257,011	330,168	...	21,387,651
1914-15 ...	7,616,511	5,161,073	3,832,003	1,745,378	2,058,244	323,265	...	20,736,474
1915-16 ...	8,006,078	5,705,163	3,745,350	1,365,410	2,088,110	343,023	...	21,853,139
GROSS REVENUE PER AVERAGE MILE WORKED.								
	£	£	£	£	£	£	£	£
1901-2 ...	1,243	1,031	493	625	1,122	408	86	886
1911-12 ...	1,709	1,473	732	1,430	763	622	...	1,195
1912-13 ...	1,743	1,430	763	1,449	732	644	...	1,190
1913-14 ...	1,956	1,484	812	1,288	776	629	...	1,253
1914-15 ...	1,877	1,341	810	861	665	603	...	1,134
1915-16 ...	1,920	1,443	758	899	627	630	...	1,142
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	161.99	99.27	70.74
1911-12 ...	84.12	90.53	70.48	83.22	86.53	71.73	...	83.06
1912-13 ...	84.43	87.77	69.54	84.09	86.98	78.00	...	82.40
1913-14 ...	90.42	88.81	77.42	83.33	97.34	79.18	...	87.23
1914-15 ...	89.52	80.94	76.71	75.06	91.40	77.18	...	83.36
1915-16 ...	89.14	99.03	77.68	83.77	97.32	79.43	...	89.24

1. For the calendar year 1902.

2. See Federal Government Railways (page 629).

8. 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 1911-16, classified according to the three chief sources of receipts. The total of the three items specified has already been given in the preceding paragraph.

**STATE RAILWAYS.—COACHING, GOODS, AND MISCELLANEOUS RECEIPTS,
1901-2 and 1911-16.**

Year.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	N. Ter.	All States.
COACHING TRAFFIC RECEIPTS.								
	£	£	£	£	£	£	£	£
1901-2	1,367,796	1,580,218	435,434	369,677	442,719	110,196	3,032	4,309,072
1911-12	2,691,741	2,624,493	1,069,533	697,775	630,673	152,304	...	7,866,519
1912-13	2,940,230	2,762,163	1,153,384	733,159	646,218	160,792	...	8,395,946
1913-14	3,236,512	2,868,705	1,257,100	752,493	666,665	165,909	...	8,947,384
1914-15	3,315,294	2,795,673	1,284,595	668,403	617,553	157,726	...	8,839,244
1915-16	3,574,063	3,003,263	1,339,753	721,555	646,566	179,784	...	9,464,984
GOODS AND LIVE STOCK TRAFFIC RECEIPTS.								
	£	£	£	£	£	£	£	£
1901-2	2,263,837	1,719,462	862,234	681,045	1,037,099	116,061	7,996	6,687,734
1911-12	3,715,707	2,506,982	1,940,596	1,345,879	1,173,844	148,199	...	10,831,207
1912-13	3,705,375	2,352,638	2,140,503	1,441,859	1,299,019	154,522	...	11,093,916
1913-14	4,397,997	2,603,415	2,359,786	1,534,187	1,483,862	154,564	...	12,533,811
1914-15	4,206,234	2,263,375	2,516,380	1,049,074	1,350,740	153,845	...	11,544,648
1915-16	4,329,971	2,610,210	2,364,364	1,211,465	1,356,452	156,860	...	12,029,322
MISCELLANEOUS RECEIPTS.								
	£	£	£	£	£	£	£	£
1901-2	37,053	68,163	84,511	34,453	41,611	6,954	1,494	274,239
1911-12	84,025	87,492	22,729	46,909	80,087	12,283	...	333,525
1912-13	103,380	90,641	27,785	47,418	92,616	11,799	...	373,639
1913-14	107,732	88,838	43,136	50,571	106,484	9,695	...	406,456
1914-15	94,983	97,025	31,028	27,901	89,951	11,694	...	352,532
1915-16	102,044	91,690	41,233	32,390	85,092	11,384	...	363,833

¹ Tasmanian figures for 1902 are for year ended the 31st December. ² Exclusive of Port Augusta-Oodnadatta line as from 1st January, 1911 (see page 629). ³ See Federal Government railways (page 629).

(i.) *New South Wales.* The total earnings for the year 1915-16 amounted to £8,006,078, an increase of £389,567 as compared with the previous year. Increases of £258,769, £123,737, and £7061 took place in the coaching traffic, goods and live stock traffic, and miscellaneous respectively.

(ii.) *Victoria.* In Victoria, traffic receipts shew an increase of £544,090 as compared with the previous year. This was due to an increase of £207,590 and £341,835 in the receipts from coaching and goods and live stock traffic respectively, though there was a decrease of £5335 in miscellaneous receipts.

(iii.) *Queensland.* In Queensland, there was a decrease of £86,653 in 1915-16 relatively to 1914-15. There were increases of £55,158 and £10,205 in respect of coaching and miscellaneous receipts respectively, but goods and live stock receipts were £152,016 lower than in 1914-15.

(iv.) *South Australia.* In this State every item of traffic gave an increased return on the figures of the previous year, the increases in coaching, goods and live stock, and miscellaneous receipts being £53,152, £162,391 and £4489 respectively. The total increase was £220,032.

(v.) *Western Australia.* In this State the earnings in 1915-16 shewed an increase of £29,866 as compared with 1914-15. There were increases of £29,013 and £5712 in the coaching, and goods and live stock receipts respectively, but a decrease of £4859 in respect of the miscellaneous receipts.

(vi.) *Tasmania.* The gross revenue in 1915-16 shews an increase of £24,763 as compared with the previous year. In the coaching, and goods and live stock receipts there were increases of £22,058 and £3015 respectively, but there was a decrease of £310 in the miscellaneous receipts.

The following table shews for the two years 1914-15 and 1915-16 the percentage which each class of receipts bears to the total gross revenue:—

STATE RAILWAYS.—PERCENTAGE OF REVENUES FROM VARIOUS SOURCES ON TOTAL REVENUE, 1914-16.

Particulars.	1914-15.						
	N.S.W.	Vic.	Qld.	S.A.	W.A.	Tas.	All States.
	%	%	%	%	%	%	%
Coaching	43.53	54.17	33.52	38.30	30.00	48.79	42.63
Goods and live stock	55.22	43.95	65.67	60.10	65.63	47.59	55.67
Miscellaneous	1.25	1.88	0.81	1.60	4.37	3.62	1.70
Particulars.	1915-16.						
	N.S.W.	Vic.	Qld.	S.A.	W.A.	Tas.	All States.
	%	%	%	%	%	%	%
Coaching	44.64	52.64	35.77	36.71	30.96	51.66	43.30
Goods and live stock	54.08	45.75	63.13	61.64	64.96	45.07	55.03
Miscellaneous	1.28	1.61	1.10	1.65	4.08	3.27	1.67

9. 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 for all States for the year ended the 30th June, 1916:—

STATE RAILWAYS.—COACHING TRAFFIC RECEIPTS PER MILE WORKED, PER PASSENGER-TRAIN MILE, AND PER PASSENGER JOURNEY, 1915-16.

State.	Number of Passenger-Train Miles. ¹	Number of Passenger Journeys.	Coaching Traffic Receipts.			
			Gross.	Per Average Mile Worked.	Per Passenger-Train Mile.	Per Passenger Journey.
	No.	No.	£	£	d.	d.
New South Wales ...	10,283,263	92,850,838	3,574,063	857	83.41	9.24
Victoria ...	7,569,353	115,771,238	3,003,263	759	95.22	6.23
Queensland ...	3,604,889	24,438,905	1,339,753	271	89.20	13.16
South Australia ...	2,785,848	20,512,753	721,555	330	62.16	8.44
Western Australia ...	2,233,680	18,884,541	646,566	194	69.47	8.22
Tasmania ...	465,122	2,078,228	179,784	326	92.76	20.76
Total ...	26,942,155	274,536,503	9,464,984	495	84.31	8.27

1. 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 ...	1,526,003	Western Australia ...	1,242,492
Victoria ...	2,507,604	Tasmania ...	674,939

The preceding table shews that, amongst the States, there is a considerable difference in the amount of the average receipts per passenger journey. This amount ranges from 5.23 pence in Victoria, where there is a large metropolitan suburban traffic, to 20.76 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 17), but is largely due to the different traffic conditions which prevail on various lines in the Commonwealth (see paragraph 14). In order to analyse these figures adequately it would be necessary to have particulars regarding the number of passenger-miles, *i.e.*, the total distance travelled by passengers, in each State, but these particulars are not generally available (see paragraph 15.)

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, 106,927,781 were metropolitan suburban passengers, *i.e.*, were carried between stations within twenty miles of Melbourne, while in New South Wales the number of suburban passenger journeys between stations within thirty-four miles of Sydney, including the Richmond line, and of Newcastle, including Greta, was 83,652,807. 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 1915-16 being 275,291,385. In Melbourne, on the other hand, the number of passengers carried on the cable tramways systems during the same period was 96,290,131; the number carried on the St. Kilda-Brighton, Prahran-Malvern Trust, Melbourne-Brunswick-Coburg Trust, Hawthorn Trust, and the North Melbourne tramways 33,849,760, making a total of 130,139,891. This is exclusive of 412,812 passengers carried by the omnibuses of the Melbourne Tramway and Omnibus Company. This matter is referred to hereinafter. (See paragraph 14.)

10. 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, 1916:—

STATE RAILWAYS.—GOODS AND LIVE-STOCK TRAFFIC RECEIPTS PER MILE WORKED, PER GOODS-TRAIN MILE, AND PER TON CARRIED, 1915-16.

State.	Number of Goods-Train Miles. 1	Goods and Live-Stock Tonnage.	Goods and Live-Stock Traffic Receipts.			
			Gross.	Per Average Mile Worked.	Per Goods-Train Mile.	Per Ton Carried.
	No.	Tons.	£	£	d.	d.
New South Wales ...	11,272,771	11,915,500	4,329,971	1,039	92.19	87.21
Victoria ...	6,257,185	5,829,835	2,610,210	660	100.12	107.46
Queensland ...	7,966,857	4,570,888	2,364,364	479	71.23	124.14
South Australia ...	2,845,136	2,396,938	1,211,465	554	102.19	121.30
Western Australia ...	2,915,609	2,554,858	1,356,452	407	111.66	127.42
Tasmania...	586,389	388,782	156,860	284	64.30	96.83
Total...	31,843,947	27,656,796	12,029,322	629	90.66	104.39

1. 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:—

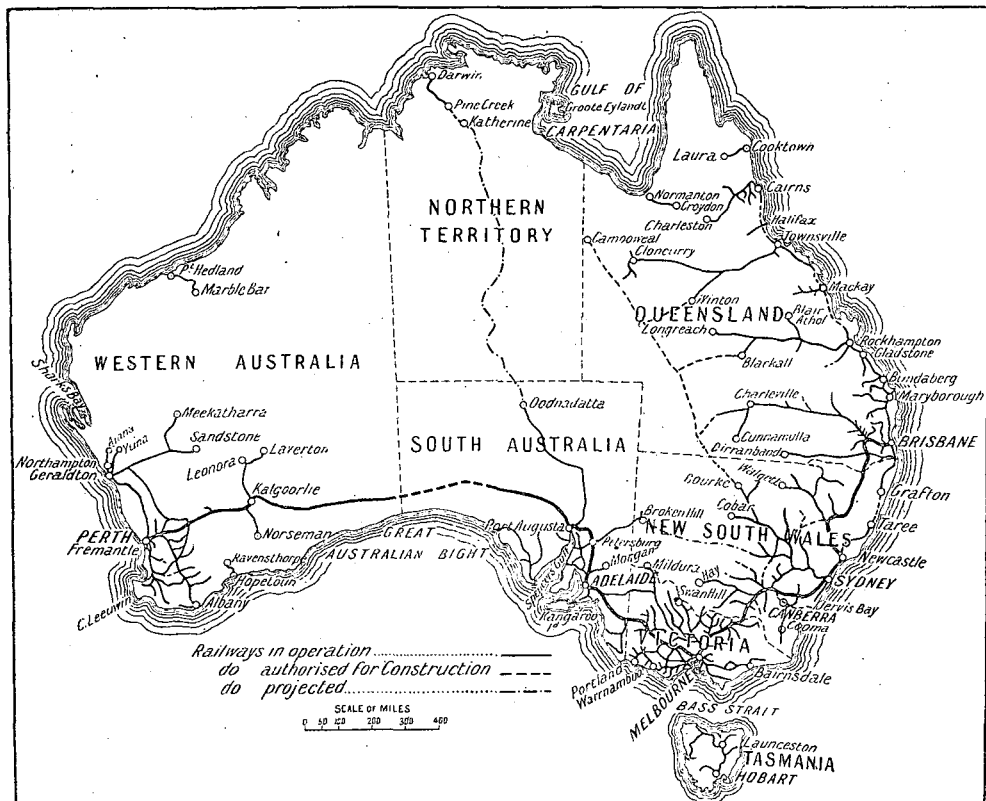
New South Wales ...	1,526,003	Western Australia ...	1,242,492
Victoria ...	2,507,604	Tasmania ...	674,939

From the preceding table it may be seen that the average cost of freight per ton ranges from 87.21 pence in New South Wales to 127.42 pence in Western Australia. The remarks made in the preceding paragraph (9) 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.

11. 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 1911-16:—

THE GOVERNMENT RAILWAY SYSTEMS OF THE COMMONWEALTH
AS AT 30TH JUNE, 1916.



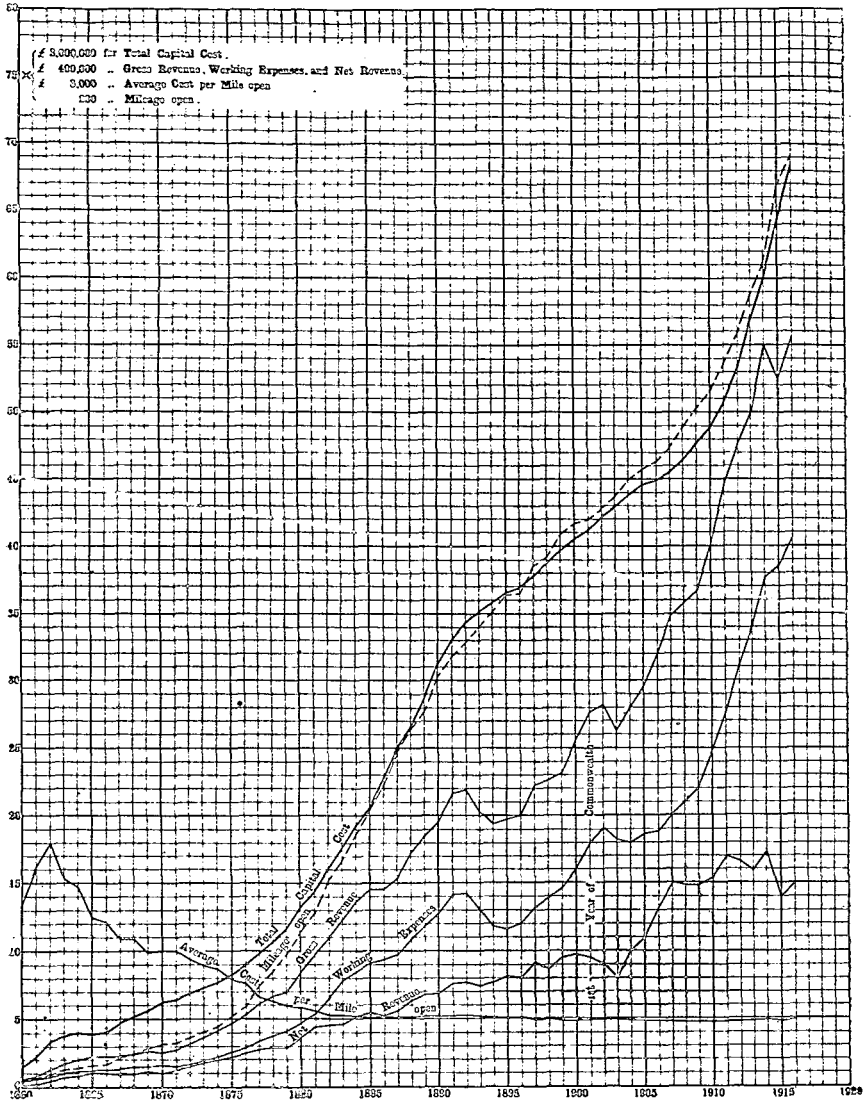
EXPLANATION OF MAP.—The continuous lines denote the existing railway lines of Australia, the heavier lines being the main routes.

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

LIST OF PRINCIPAL SECTIONS OF RAILWAYS.

	Miles.		Miles.		Miles.
Townsville to Winton	368	Sydney to Nimmitabel	291	Adelaide to Broken Hill	335
Townsville to Selwyn	552	" Melb'rne (17 hrs.)	582½	" Oodnadatta	688
Rockhampton to Longreach	428	Adelaide to Melb. (17 hrs.)	482½	Perth to Laverton	586
Brisbane to Cunnamulla	604	Melbourne to Merbein	358	" Meekatharra	597
Brisbane to Sydney (25½ hrs.)	715½	" Swan Hill	215	" Albany	340
Newcastle to Inverell	405	" S. Aust. border		Hobart to Launceston	133
Sydney to Bourke	508	via Murrayville	369½		
" Hay	460				

GRAPHS SHEWING THE FINANCIAL POSITION OF THE GOVERNMENT RAILWAYS OF THE COMMONWEALTH, 1860 to 1916.



(See page 651.)

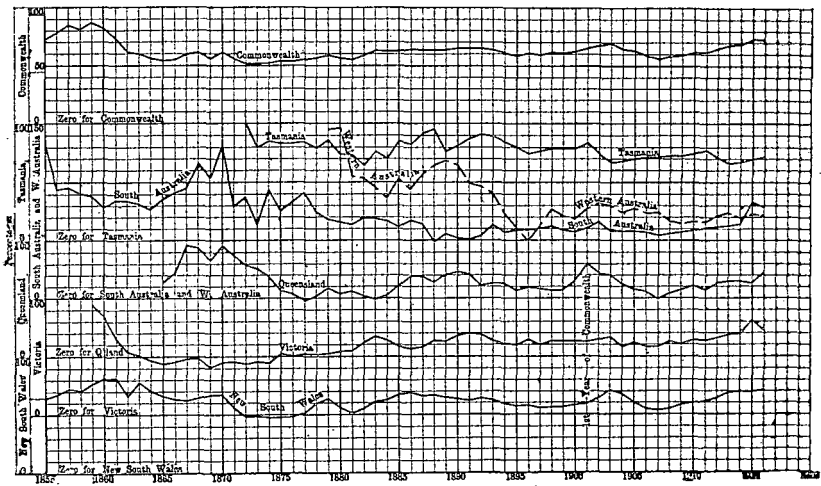
EXPLANATION OF GRAPHS.—In the above diagram the base of each small square represents throughout one year. The significance of the vertical height of each square varies, however, according to the nature of the several curves.

In the heavy curve denoting the total capital cost of the railways of the Commonwealth, the vertical side of each square denotes £3,000,000.

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

For the curves shewing the percentage of working expenses to gross revenue, and the percentage of net revenue to capital cost, see graphs on pages 647 and 648 respectively.

GRAPHS SHEWING PERCENTAGES OF WORKING EXPENSES TO GROSS REVENUE FOR GOVERNMENT RAILWAYS FOR STATES AND COMMONWEALTH, 1855 to 1916.

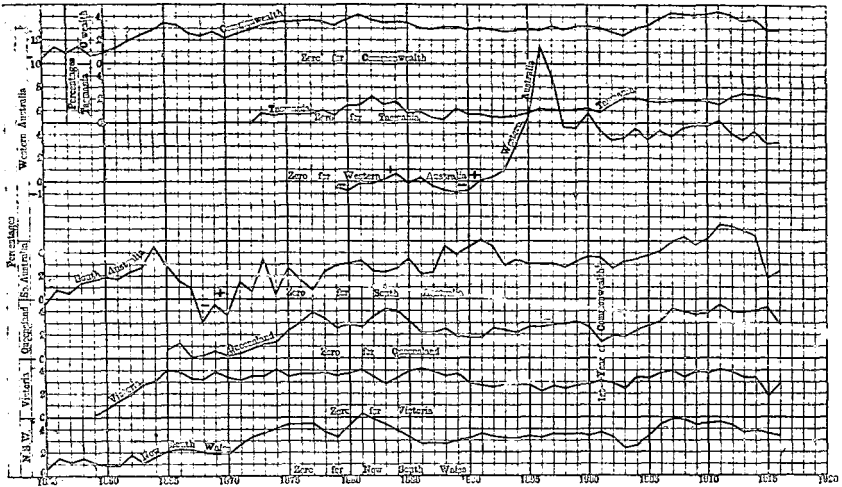


(See page 649.)

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 1916.



(See page 651.)

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.

STATE RAILWAYS.—TOTAL WORKING EXPENSES AND PERCENTAGES OF WORKING EXPENSES UPON GROSS REVENUES, 1901-2 and 1911-16.

Year.	N.S.W.	Victoria. ¹	Q'land.	S. Aust. ⁴	W. Aust.	Tas.	N. Ter.	All States.
TOTAL WORKING EXPENSES.								
	£	£	£	£	£	£	£	£
1901-2 ...	2,342,369	2,166,119	992,751	689,517	1,256,370	173,292 ²	34,649	7,655,067.
1911-12 ...	4,169,591	3,441,803	1,917,266	1,293,987	1,343,977	221,172	...	12,387,796
1912-13 ...	4,644,881	3,589,194	2,150,991	1,393,775	1,506,600	217,357	...	13,502,798
1913-14 ...	5,409,820	3,865,498	2,371,261	1,505,765	1,572,008	222,713	...	14,947,065
1914-15 ...	5,311,162	4,238,411	2,401,679	1,448,495	1,497,826	225,995	...	15,123,568
1915-16 ...	5,661,168	4,118,744	2,745,061	1,545,489	1,511,655	248,651	...	15,830,768
PERCENTAGE OF WORKING EXPENSES ON GROSS EARNINGS.								
	%	%	%	%	%	%	%	%
1901-2 ...	63.85	64.32	71.83	63.54	82.58	74.31 ²	276.70	67.92
1911-12 ...	64.23	65.95	63.22	61.90	71.31	70.71	...	65.33
1912-13 ...	68.82	68.95	64.76	62.71	73.93	66.45	...	68.11
1913-14 ...	69.87	69.51	64.79	64.43	69.65	67.45	...	68.29
1914-15 ...	69.73	82.12	62.67	82.99	72.77	69.91	...	72.93
1915-16 ...	70.71	72.19	73.29	78.63	72.39	71.45	...	72.43

1. Including amounts paid for pensions and gratuities, and also special expenditures and charges for belated repairs and in reduction of deficiencies. 2. For the calendar year 1902. 3. See Federal Government railways, page 629. 4. Exclusive of the Port Augusta-Oodnadatta line as from 1st January, 1911.

(i.) *New South Wales.* In this State the total working expenses in 1915-16 amounted to £5,661,168, an increase of £350,006 as compared with the previous year. This increase was owing to a variety of causes, among which the principal were the reinstatement of full services on branch lines, and of full time being worked by the staff, increase of wages by awards of wages boards, higher cost of materials, and amount paid as difference between the departmental and military pay to employees serving in the Expeditionary Forces.

(ii.) *Victoria.* In Victoria the decrease in working expenses was owing mainly to the reduction in the train mileage, which in the year 1915-16 was 1,476,671 miles less than in the previous year, and in the amount expended for special and abnormal charges owing to the war, etc.

(iii.) *Queensland.* In this State the working expenses increased £343,382 from £2,401,679 in 1914-15 to £2,745,061 in 1915-16. The increase was mainly due to the additions to the wages of the staff by 8½ per cent., the extra cost of materials, higher freights of stores and fuel to the northern ports, and the opening of new lines, 129 miles in length.

(iv.) *South Australia.* In South Australia the working expenses in 1915-16 shewed an increase of £96,994 over 1914-15, viz., from £1,448,495 to £1,545,489. This was owing to an increase in the train mileage, coupled with the advance in the price of fuel and special repairs to locomotives injured owing to water troubles during the drought.

(v.) *Western Australia.* In this case the expenditure was £13,829 higher than in the previous year. As 236 miles of new lines were opened for traffic in the year 1914-15, this small increase was satisfactory.

(vi.) *Tasmania.* The working expenses in 1915-16 were £248,651 as compared with £225,995 in the previous year, being an increase of £22,656.

In the preceding table it will be observed that there has been an annual increase during the four financial years 1911-15 in the percentages of the total working expenses to the total gross earnings of the States' railways, but that in the last financial year 1915-16 there was a small decrease as compared with the previous year.

(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 1911-16:—

STATE RAILWAYS.—WORKING EXPENSES PER AVERAGE MILE WORKED AND PER TRAIN MILE RUN, 1901-2 and 1911-16.

Year.	N.S.W.	Victoria.	Q'land.	² S. Aust.	W. Aust.	Tas.	N. Ter.	All States.
WORKING EXPENSES PER AVERAGE MILE WORKED.								
	£	£	£	£	£	£	£	£
1901-2 ...	793	663	354	397	927	1,370	238	602
1911-12 ...	1,098	971	463	885	544	440	...	778
1912-13 ...	1,200	986	494	908	541	428	...	809
1913-14 ...	1,367	1,032	526	830	540	424	...	856
1914-15 ...	1,309	1,101	508	715	484	422	...	827
1915-16 ...	1,358	1,042	556	707	454	450	...	827
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	³ 46.06	274.67	48.05
1911-12 ...	54.03	59.70	44.55	51.51	61.71	50.72	...	54.07
1912-13 ...	58.11	60.52	45.03	52.74	64.30	51.83	...	56.01
1913-14 ...	63.18	61.73	50.16	53.69	67.80	53.41	...	59.57
1914-15 ...	62.42	66.47	48.08	62.29	66.51	53.96	...	60.80
1915-16 ...	63.03	71.49	56.93	65.87	70.45	56.75	...	64.63

¹ For the calendar year 1902. ² Excluding the Port Augusta-Oodnadatta line as from the 1st of January, 1911 (see page 627). ³ For 6 months only.

12. **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 1911-16:—

STATE RAILWAYS.—DISTRIBUTION OF WORKING EXPENSES, 1901-2 and 1911-16.

Year.	N.S.W.	Victoria.	Q'land.	S. Aust. ¹	W. Aust.	Tas.	N. Ter.	All States.
MAINTENANCE.								
	£	£	£	£	£	£	£	£
1901-2 ...	554,483	490,438	355,615	166,691	246,931	² 58,612	29,001	1,901,771
1911-12 ...	906,001	840,141	582,097	308,479	291,490	63,669	...	3,971,877
1912-13 ...	1,024,215	876,631	601,866	291,361	322,267	58,534	...	3,174,874
1913-14 ...	1,109,749	928,702	649,925	308,244	362,517	57,685	...	3,416,892
1914-15 ...	918,790	1,107,310	626,798	280,062	346,771	58,253	...	3,337,984
1915-16 ...	895,526	998,619	738,160	306,420	361,627	66,090	...	3,366,442
LOCOMOTIVE, CARRIAGE, AND WAGON CHARGES.								
	£	£	£	£	£	£	£	£
1901-2 ...	1,102,314	845,464	389,766	343,572	670,465	² 63,732	3,210	3,418,603
1911-12 ...	1,984,997	1,390,378	793,840	631,939	655,795	88,254	...	5,545,203
1912-13 ...	2,162,217	1,465,733	914,827	729,675	747,240	86,300	...	6,105,991
1913-14 ...	2,687,079	1,636,480	1,015,522	803,431	746,882	96,676	...	6,986,060
1914-15 ...	2,755,669	1,789,836	1,051,683	793,997	714,173	99,829	...	7,205,187
1915-16 ...	2,917,299	1,747,319	1,196,160	859,334	714,802	107,885	...	7,544,799
TRAFFIC EXPENSES.								
	£	£	£	£	£	£	£	£
1901-2 ...	588,938	671,588	226,237	162,626	306,409	² 42,416	2,106	2,000,322
1911-12 ...	1,133,539	901,024	516,838	325,259	359,025	57,570	...	3,293,255
1912-13 ...	1,343,707	947,868	585,681	346,705	397,274	60,890	...	3,682,055
1913-14 ...	1,491,493	1,066,738	665,406	365,954	415,836	57,731	...	4,054,088
1914-15 ...	1,502,945	1,099,026	671,622	347,437	392,628	57,814	...	4,071,472
1915-16 ...	1,638,942	1,127,568	744,229	350,472	393,033	62,326	...	4,316,570
OTHER CHARGES.								
	£	£	£	£	£	£	£	£
1901-2 ...	96,634	158,629	21,133	16,628	32,545	² 8,472	330	334,371
1911-12 ...	145,064	310,260	44,491	23,310	37,667	11,679	...	577,461
1912-13 ...	114,742	298,963	48,617	26,034	39,819	11,703	...	539,878
1913-14 ...	121,569	233,578	49,408	23,146	46,773	10,621	...	490,095
1914-15 ...	133,758	242,239	51,576	26,999	44,254	10,099	...	508,925
1915-16 ...	209,401	245,238	64,512	29,263	42,193	12,350	...	602,957

1. Excluding the Port Augusta-Oodnadatta line as from the 1st of January, 1911 (see page 629).
2. For the calendar year 1902.

13. **Net Revenue, Total and per Cent. on Capital Cost.**—The following table shows the net sums available to meet interest charges, and also the percentage of such sums upon the capital cost of construction and equipment of lines opened for traffic in each State for the years 1901-2 and 1911-16:—

STATE-RAILWAYS.—NET REVENUE AND PERCENTAGE OF NET REVENUE UPON CAPITAL COST OF LINES OPEN, 1901-2 and 1911-16.

Year.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	N. Ter.	All States.
NET REVENUE.								
	£	£	£	£	£	£	£	£
1901-2 ...	1,326,317	1,201,724	389,428	395,658	265,059	259,919	-22,127	3,615,978
1911-12 ...	2,321,882	1,777,164	1,115,592	796,573	540,627	91,614	...	6,643,455
1912-13 ...	2,104,104	1,616,248	1,170,681	828,661	531,253	109,756	...	6,360,703
1913-14 ...	2,332,421	1,695,460	1,288,761	831,486	685,003	107,455	...	6,940,586
1914-15 ...	2,305,349	922,652	1,430,324	296,883	560,418	97,270	...	5,612,906
1915-16 ...	2,344,910	1,586,419	1,000,289	419,921	576,455	99,377	...	6,027,371
PERCENTAGE OF NET REVENUE ON CAPITAL EXPENDITURE.								
	%	%	%	%	%	%	%	%
1901-2 ...	3.27	2.96	1.94	3.10	3.58	21.56	-2.17	2.61
1911-12 ...	4.37	3.88	3.05	6.23	4.09	2.15	...	4.23
1912-13 ...	3.69	3.40	3.03	5.30	3.56	2.49	...	3.80
1913-14 ...	3.85	3.44	4.05	5.46	4.32	2.39	...	3.83
1914-15 ...	3.60	1.79	4.28	1.79	3.20	2.10	...	3.00
1915-16 ...	3.41	2.92	2.88	2.44	3.27	2.07	...	3.06

¹ Exclusive of Port Augusta-Oodnadatta line as from the 1st of January, 1911 (see page 627).

² For the calendar year 1902.

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

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

STATE RAILWAYS.—NET REVENUE PER AVERAGE MILE WORKED AND PER TRAIN MILE RUN, 1901-2 and 1911-16.

Year.	N.S. W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	N. Ter.	All States.
NET REVENUE PER AVERAGE MILE WORKED.								
	£	£	£	£	£	£	£	£
1901-2 ...	449	368	139	228	195	2128	-153	284
1911-12 ...	611	502	269	545	219	182	...	417
1912-13 ...	543	444	269	540	191	216	...	381
1913-14 ...	589	452	286	458	235	205	...	397
1914-15 ...	568	240	302	147	181	181	...	307
1915-16 ...	562	401	202	192	173	180	...	315
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	215.93	-175.40	23.16
1911-12 ...	30.09	30.83	25.93	31.71	24.82	21.01	...	29.00
1912-13 ...	26.32	27.25	24.51	31.85	22.67	26.17	...	26.39
1913-14 ...	27.24	27.07	27.26	29.64	29.54	25.77	...	27.66
1914-15 ...	27.10	14.47	28.63	12.77	24.89	23.23	...	22.56
1915-16 ...	26.11	27.54	20.75	17.90	26.87	22.68	...	24.61

1. Exclusive of Port Augusta-Oodnadatta line as from the 1st of January, 1911 (see page 627).

2. For the calendar year 1902.

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

14. **Traffic Conditions.**—Reference has already been made to the difference in the traffic conditions on many of the lines of the Commonwealth (see paragraphs 9, 10, and 11 hereof). These conditions differ not only in the several States, but also on different lines in the same State, and this is true with regard to both passenger and goods traffic. By far the greater part of the population of Australia is confined to a fringe of country near the coast, more especially in the eastern and southern districts. A large proportion of the railway traffic between the chief centres of population is therefore carried over lines in the neighbourhood of the coast, and is thus, in some cases, open to sea-borne competition. On most of the lines extending into the more remote interior districts, traffic is light; the density of population diminishes rapidly as the coastal regions are left behind; there is a corresponding diminution in the volume of traffic, while, in comparison with other more settled countries, there is but little back-loading.

As an indication of the different traffic conditions prevailing in the several States, the following table is given shewing the numbers of passenger journeys and the tons of goods carried (a) per 100 of the mean population; and (b) per average mile worked in each State during the financial year 1915-16:—

STATE RAILWAYS.—PASSENGER JOURNEYS AND TONNAGE OF GOODS AND LIVE STOCK, 1915-16.

Particulars.			N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	Total.
(a) PER 100 OF MEAN POPULATION.									
Passenger journeys	...	No.	4,969	8,166	3,592	4,666	5,938	1,034	5,574
Goods and live stock	...	Tons	638	411	672	545	803	193	561
(b) PER AVERAGE MILE OF LINE WORKED.									
Passenger journeys	...	No.	22,372	29,272	4,948	9,388	5,668	3,765	14,350
Goods and live stock	...	Tons	2,858	1,474	925	1,097	767	704	1,446

¹ Exclusive of the returns of the Federal lines.

Particulars of the actual numbers of passengers and tons of goods and live stock carried have already been given (see paragraph 2 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 shows the number of metropolitan and country passengers carried in each of the States mentioned and the revenue derived therefrom during the year 1915-16:—

STATE RAILWAYS.—METROPOLITAN SUBURBAN, AND COUNTRY PASSENGER TRAFFIC, 1915-16.

Particulars.	Number of Passenger Journeys.			Revenue.		
	Metropolitan.	Country.	Total.	Metropolitan.	Country.	Total.
N.S.W. ...	¹ 83,652,807	9,198,031	92,850,838	£ 1,054,890	£ 2,092,151	£ 3,147,041
Victoria ...	² 106,927,781	8,843,457	115,771,238	£ 1,133,905	£ 1,507,860	£ 2,641,765

¹ Within 34 miles of Sydney and Newcastle, and including the Richmond line.

² Within 20 miles of Melbourne, but exclusive of St. Kilda-Brighton tramway.

From this table it may be seen that the number of passenger-journeys in country districts in Victoria was slightly less than the corresponding number in New South Wales, while the number of metropolitan passenger-journeys in Victoria was 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 were put in hand at an estimated cost of £2,250,299. It was anticipated that a portion of the suburban railway system would be electrically operated by the end of 1915, but, owing to delays in the delivery of plant, due to the war, the date of opening had to be postponed. It is now expected that electrically-propelled trains will be in operation early in the year 1918. 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, and the plans have been prepared, and a commencement has been made with the preliminary works. The preliminary work in the location of a system of electric railways for the eastern, western and northern suburbs is also in hand.

(ii.) *Goods Traffic.* The differing conditions of the traffic in each State might also, to some extent, be analysed by an examination of the tonnage of various classes of commodities carried and of the revenue derived therefrom. Comparative particulars regarding the quantities of some of the leading classes of commodities carried on the Government railways are available for all the States; corresponding information regarding the revenue derived from each class of commodity is not, however, generally available in a comparable form. In this connection it may be stated that the following resolution was passed at the Interstate Conference of Railway Commissioners held in Melbourne in May, 1909:—"That in view of the variations in the character and classification of the goods traffic in the different States, the subdivisions 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 1915-16:—

STATE RAILWAYS.—CLASSIFICATION OF COMMODITIES CARRIED, 1915-16.

State.	Minerals.	Fire-wood.	Grain and Flour.	Hay, Straw, and Chaff.	Wool.	Live Stock.	All other Com-modities.	Total.
TONS CARRIED.								
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
New South Wales ...	7,100,564	187,135	3852,019	429,047	111,083	797,065	2,137,113	11,614,026
Victoria ...	1,217,771	475,723	1,256,187	274,420	42,364	453,264	2,110,106	5,829,835
Queensland ...	1,552,011	244,746	*31,980	*196,403	51,282	487,271	3,007,190	4,570,883
South Australia ...	790,627	119,561	439,194	74,006	18,697	123,770	825,983	2,396,938
Western Australia...	564,757	636,944	439,931	75,988	8,904	72,665	755,669	2,554,858
Tasmania ...	92,237	23,203	... ^e	31,149	4,508	21,993	210,702	388,762
⁷ Total ...	11,317,957	1,692,412	3,019,311	1,081,013	236,838	1,961,028	8,046,763	27,355,322
PERCENTAGE ON TOTAL TONNAGE CARRIED.								
	%	%	%	%	%	%	%	%
New South Wales ...	61.14	1.61	37.34	3.69	0.96	6.86	18.40	100.00
Victoria ...	20.89	8.16	21.55	4.71	0.73	7.77	36.19	100.00
Queensland ...	33.96	5.35	*0.70	*4.30	1.12	10.66	43.91	100.00
South Australia ...	32.99	4.99	18.32	3.09	0.78	5.37	34.46	100.00
Western Australia...	22.11	24.93	17.22	2.97	0.35	2.84	29.58	100.00
Tasmania ...	23.72	7.25	... ^e	8.01	1.16	5.66	54.20	100.00
⁷ Total ...	41.37	6.19	11.04	3.95	0.87	7.17	29.41	100.00

1. Exclusive of 301,474 tons of coal, on which only shunting and haulage were collected.
 2. Coal, stone, gravel, and sand. 3. Up journey only. 4. Flour only. 5. Sugar cane.
 6. Included in all other commodities. 7. Exclusive of Federal lines.

15. **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 following resolution in regard thereto was passed at the Interstate Conference of Railway Commissioners held in Melbourne in May, 1909:—"That, in view of the differing conditions in each State, and of the expense involved, it is undesirable to include passenger-mile and ton-mile statistics in the annual reports." The general question as to the desirability of collecting and publishing "passenger-mile" and "ton-mile" statistics by railway companies in the United Kingdom has been made the subject of inquiry by a departmental committee appointed by the President of the Board of Trade. The report of this committee has been published in England as a parliamentary paper.¹

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

(i.) *Passenger-Miles.* Particulars for the whole of the Commonwealth period regarding total "passenger-miles" are available for one State only, namely, Tasmania. For New South Wales to the end of 1909-10, particulars are only available for suburban and extended-suburban traffic—*i.e.*, including all stations within 34 miles of Sydney (including the Richmond line), and of Newcastle (including Greta), but since that date all passenger traffic is included. 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 for the year 1902 are naturally smaller than those for the other States, since the figures for that State refer to suburban and extended-suburban traffic only as already stated.

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.

STATE RAILWAYS.—SUMMARY OF "PASSENGER MILES," 1901-2 and 1912-16.

Year ended 30th June.	Pass'nger 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.	Density of Traffic per Average Mile Worked.
	Miles. (000 omitted.)	No. (000 omitted.)	No. (000 omitted.)	£	No.	Miles.	d.	d.	No.

NEW SOUTH WALES.¹

1902 ¹	... ²	27,999	184,064	361,849	... ³	6.57	0.47	2.92	... ³
1912	8,978	70,707	1,091,088	2,349,279	122	15.43	0.52	7.97	287,204
1913	9,667	79,490	1,192,584	2,571,446	123	15.00	0.52	7.76	308,002
1914	10,081	86,328	1,235,025	2,832,450	123	14.30	0.55	7.87	311,954
1915	10,099	88,774	1,230,901	2,910,684	122	13.87	0.57	7.87	303,402
1916	10,283	92,851	1,321,491	3,147,041	129	12.85	0.57	8.13	316,980

SOUTH AUSTRALIA.³

1912	2,614	18,353	213,299	589,045	82	11.62	0.65	7.70	127,267
1913	2,804	19,382	228,707	619,094	82	11.80	0.64	7.67	149,092
1914	2,952	19,809	236,764	635,967	80	11.95	0.63	7.70	130,449
1915	2,815	18,831	215,489	560,012	77	11.44	0.60	7.14	106,362
1916	2,786	20,513	218,609	603,203	78	10.66	0.66	7.06	100,050

TASMANIA.

1902 ⁴	336	761	19,444	88,541	58	25.60	1.09	27.91	42,086
1912	396	1,715	34,292	126,886	86	19.99	0.87	17.75	63,174
1913	438	1,650	35,607	135,545	81	21.58	0.91	19.71	70,092
1914	446	1,708	36,028	140,185	81	21.09	0.91	19.69	68,624
1915	454	1,751	36,051	132,680	79	20.59	0.88	18.19	67,260
1916	465	2,078	46,719	154,225	100	22.48	0.79	17.81	84,567

¹ Suburban lines only for year 1902; includes distances within 34 miles of Sydney and Newcastle, and including also the Richmond line. ² Not available. ³ Exclusive of the returns of the Port Augusta to Oodnadatta line on and after 1st January, 1911. ⁴ To 31st December, 1902.

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

STATE RAILWAYS.—SUMMARY OF "TON MILES," 1901-2 and 1912-16.

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

NEW SOUTH WALES.¹

1902	6,586	6,164	436,814	1,947,305	66.32	70.87	1.07	148,464
1912	9,544	10,632	862,016	3,181,771	90.32	81.08	0.89	226,906
1913	9,517	11,402	861,940	3,153,626	90.57	75.60	0.88	222,608
1914	10,469	12,901	1,037,911	3,760,384	99.14	80.45	0.87	262,165
1915	10,321	11,660	916,923	3,633,613	88.84	78.64	0.95	226,010
1916	11,273	11,614	1,028,760	3,738,227	91.26	88.58	0.87	246,764

SOUTH AUSTRALIA.²

1902	2,468	1,392	170,523	681,045	69.09	122.48	0.96	98,803
1912	3,415	2,782	334,125	1,345,879	97.84	120.11	0.97	199,358
1913	3,539	3,016	355,404	1,441,859	100.43	117.84	0.97	231,685
1914	3,780	3,103	402,356	1,534,187	106.45	129.65	0.92	221,684
1915	2,766	2,076	237,014	1,049,074	85.70	114.15	1.06	116,986
1916	2,845	2,397	278,942	1,211,465	98.04	116.37	1.04	127,662

WESTERN AUSTRALIA.³

1907	1,940	2,091	144,856	964,653	74.67	69.26	1.60	86,429
1908	1,976	2,059	142,719	948,373	72.22	69.32	1.59	77,989
1909	2,011	1,997	143,629	945,956	71.41	71.92	1.58	72,871
1910	2,281	2,242	163,651	1,042,789	71.75	73.00	1.53	77,855
1911	2,548	2,489	182,738	1,154,662	71.71	73.42	1.52	79,938
1912	2,747	2,542	184,748	1,154,087	67.25	72.67	1.49	77,767

TASMANIA.⁴

1902 ⁵	567	407	14,331	109,266	25.26	35.30	1.82	31,019
1912	651	452	17,672	138,184	27.16	39.09	1.87	35,133
1913	569	447	17,747	144,073	31.17	39.67	1.94	34,104
1914	554	389	18,709	142,642	33.76	48.06	1.82	35,826
1915	551	388	19,809	141,049	35.90	51.09	1.70	37,000
1916	586	367	20,105	145,094	34.29	54.81	1.73	36,392

1. Exclusive of tonnage on which only shunting and haulage charges are collected. 2. Exclusive of the returns of the Port Augusta to Oodnadatta line on and after 1st January, 1911. 3. Particulars for 1913, 1914, 1915, and 1916 and for years prior to 1907 not available. 4. Exclusive of live stock. 5. To 31st December.

(iii.) *Classification of Commodity Ton Mileage.* New South Wales and Tasmania are the only States for which particulars, specifying the ton-mileage and the earnings per ton-mile for various classes of commodities, are available.

The subjoined statement gives particulars for the last financial year in respect of New South Wales. Miscellaneous traffic consists of timber, bark, bricks, drain-pipes in six-ton lots, and cement in full truck loads, 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, 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 301,474 tons of coal on which only shunting and haulage charges were collected, nor does it include £64,992 for haulage, tonnage dues, etc.

NEW SOUTH WALES.—SUMMARY OF TON-MILEAGE FOR THE YEAR ENDED 30th JUNE, 1916.

Particulars.	Total Tons Carried.	Total Miles Carried.	Average Miles per Ton.	Earnings (exclusive of Terminals).	Earnings per Ton Mile.	Percent. on Total Tonnage.
	Tons.	Miles.	Miles.	£	d.	%
Coal, coke, and shale ...	6,109,029	174,533,076	28.57	377,603	0.52	52.60
Other minerals ...	753,959	39,464,931	52.34	87,900	0.53	6.49
Crude ores ...	237,576	24,947,862	105.01	52,555	0.50	2.05
Miscellaneous ...	748,363	71,935,606	96.12	188,071	0.63	6.44
Firewood ...	187,135	6,667,839	35.63	19,526	0.70	1.61
Fruit ...	81,941	13,307,297	162.40	51,509	0.93	0.70
Grain, flour, etc. (Up Journey) ...	852,019	194,596,359	228.39	338,417	0.42	7.34
Hay; straw, and chaff ...	429,047	108,965,460	253.97	149,705	0.32	3.70
Frozen meat ...	28,704	4,979,143	176.46	20,993	1.01	0.25
General goods ...	1,006	349,450	347.36	3,785	2.60	0.00
A Class ...	512,933	49,998,029	97.47	228,345	1.10	4.42
B " ...	350,285	36,830,783	105.11	270,693	1.76	3.02
C " ...	30,221	2,074,549	68.65	23,950	2.77	0.26
1st Class ...	152,563	17,525,907	114.88	227,119	3.11	1.31
2nd " ...	231,097	34,824,009	150.69	586,169	4.04	1.99
Wool ...	111,083	32,329,276	291.04	262,799	1.95	0.96
Live stock ...	797,065	215,430,723	270.28	849,088	0.95	6.86
Total ...	11,614,026	1,028,760,304	88.58	3,738,227	0.87	100.00

In the following table will be found particulars of the ton-mileage in the case of Tasmania:—

TASMANIA.—SUMMARY OF TON-MILEAGE FOR THE YEAR ENDED 30th JUNE, 1916.

Particulars.	Total Tons Carried.	Total Miles Carried.	Average Miles per Ton.	Earnings.	Earnings per Ton Mile.	Percent. on Total Tonnage.
	Tons.	Miles.	Miles.	£	d.	%
Agricultural produce ...	90,102	4,385,004	48.66	29,154	1.59	24.57
Hay, straw, chaff and horse feed ...	31,149	1,317,486	42.29	8,866	1.61	8.49
Manures ...	11,987	321,770	26.84	1,478	1.10	3.27
Native coal ...	63,271	6,473,997	102.32	19,684	0.72	17.25
Minerals, other than native coal ...	28,956	872,155	30.12	6,911	1.90	7.89
Bark ...	1,457	57,291	39.32	477	1.99	0.39
Firewood ...	23,203	648,819	23.00	3,184	1.17	7.69
Timber ...	38,316	1,340,864	34.99	7,926	1.41	10.45
Wool ...	4,508	276,017	61.22	3,369	2.92	1.23
Miscellaneous goods ...	68,840	4,411,308	64.08	64,045	3.48	18.77
Total ...	366,789	20,104,711	54.81	145,094	1.73	100.00

16. **Interest Returned on Capital Expenditure.**—In the table in paragraph 13 hereof, it will be seen that the State Government railways in the year 1901-2 made a profit of 2.81 per cent. on the capital expenditure at that time. In the subsequent years up to and including the year 1910-11, the percentages were 2.48, 3.04, 3.28, 3.91, 4.37, 4.23, 4.13, 4.18 and 4.56 respectively, rates which show a substantial increase on that for the first-named year. Since 1910-11, the rates have fallen each year with the exception of the year 1913-14, the rate for the year 1915-16 being 2.07, or 0.74 lower than that for 1901-2. The reasons for this reduction are to be found in the increases of the charges in respect of working expenses, brought about by the opening of new lines, the higher cost of materials, and the raising of the rate of wages, while in the last two years additional expenses have been incurred in consequence of the war. The return on the capital invested as at the 30th June, 1916, was not equal to the interest payable for that year, the rate of which was 3.75 per cent. This average, however, 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 the money had to be raised at a very high rate of interest. 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 States, forming, in fact, three-fifths of 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 by the States up to a recent period is represented to a large extent by public works which pay a direct return. In addition to the purely commercial aspect of the figures relating to the revenue and expenditure of the State 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 their railway systems 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.

(i.) *Profit or Loss after Payment of Working Expenses and Interest.*—The net revenue of the Government railways of each State after payment of working expenses is shewn in paragraph 13 hereof. The following table shews the amount of interest payable on expenditure from loans on the construction and equipment of the railways of 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. Railways owned by the Commonwealth Government are not included in this return.

It will be seen that during the three years ended 30th June, 1914, all the States, with the exception of Queensland in 1913, and Tasmania for all three years, shew a net profit after paying working expenses and interest. In the year ended 30th June, 1915, only two States, New South Wales and Queensland, shew a profit, all the other States a loss, while in the year ended 30th June, 1916, all the States shew a loss.

STATE RAILWAYS.—INTEREST ON LOAN EXPENDITURE, PROFIT OR LOSS, AND PERCENTAGE OF PROFIT OR LOSS ON TOTAL COST, 1901-2 and 1911-16.

Year.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	N. Ter.	All States.
AMOUNT OF INTEREST ON RAILWAY LOAN EXPENDITURE.								
	£	£	£	£	£	£	£	£
1901-2 ...	1,434,638	1,492,695	837,205	469,787	234,932	140,550	47,012	4,656,819
1911-12 ...	1,901,326	1,511,024	1,069,840	456,733	439,153	159,123	...	5,537,199
1912-13 ...	1,903,660	1,591,927	1,170,961	492,907	505,925	164,412	...	5,929,792
1913-14 ...	2,089,495	1,674,036	1,250,593	566,497	556,843	169,268	...	6,306,737
1914-15 ...	2,279,070	1,764,379	1,312,196	584,812	536,069	172,349	...	6,998,875
1915-16 ...	2,568,659	1,922,410	1,418,280	663,588	625,250	180,772	...	7,378,959

PROFIT OR LOSS AFTER PAYMENT OF WORKING EXPENSES, INTEREST, AND OTHER CHARGES.²

	£	£	£	£	£	£	£	£
1901-2 ...	-108,321	-290,971	-447,777	-74,129	+30,127	-80,631	-69,139	-1,040,841
1911-12 ...	+420,556	+266,140	+45,752	+339,844	+101,474	-67,509	...	+1,106,257
1912-13 ...	+200,444	+24,321	280	+335,754	+25,398	-54,656	...	+530,911
1913-14 ...	+242,926	+21,424	+38,163	+264,989	+128,160	-61,813	...	+633,849
1914-15 ...	+26,279	-841,717	+118,128	-287,929	-25,651	-75,079	...	-1,085,969
1915-16 ...	-223,749	-335,991	-417,991	-243,667	-48,795	-81,395	...	-1,351,588

PERCENTAGE OF PROFIT OR LOSS ON CAPITAL COST OF CONSTRUCTION AND EQUIPMENT.²

	%	%	%	%	%	%	%	%
1901-2 ...	-0.27	-0.73	-2.22	-0.58	+0.41	-2.10	-6.71	-0.82
1911-12 ...	+0.79	+0.58	+0.16	+2.65	+0.77	-1.59	...	+0.71
1912-13 ...	+0.35	+0.05	-0.00	+2.39	+0.17	-1.24	...	+0.32
1913-14 ...	+0.40	+0.04	+0.12	+1.74	+0.81	-1.37	...	+0.36
1914-15 ...	+0.04	-1.63	+0.35	-1.73	-0.15	-1.62	...	-0.58
1915-16 ...	-0.33	-0.62	-1.20	-1.41	-0.29	-1.70	...	-0.69

¹ Inclusive of Port Augusta-Oodnadatta line to 31st December, 1910. ² The positive sign indicates a profit, the negative a loss. ³ Allowing for payment of special expenditure and charges (see paragraph 11 above).

17. **Passenger Fares and Goods Rates.**—Fares and rates are changed from time to time to suit the convenience and varying necessities of the railways, but, as traffic is developed and revenue increases, they are 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, periodical, and excursion fares. (d) Special fares for workmen, 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, and with one-sixth added to the 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. In Victoria and Western Australia, 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, Queensland, South Australia, and Tasmania the issue of ordinary return tickets outside the suburban areas has now been discontinued. Special excursion return tickets are, however, issued at certain times of the year, subject to restrictions as to break of journey and trains available for such tickets.

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

ORDINARY PASSENGER MILEAGE RATES ON STATE RAILWAYS, 1916.

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 ¹ ...	4 7	11 2	24 3	37 5	50 6	60 9
Victoria ...	8 0	15 10	31 6	46 0	61 2	75 8
Queensland ...	8 2	15 4	29 10	43 4	56 0	68 8
South Australia ...	7 6	15 0	30 0	45 0	60 0	75 0
Western Australia ...	8 4	16 8	33 4	50 0	66 8	83 4
Tasmania ...	7 5	14 8	29 3	...	...	...
Average ² ...	7 4	14 9	29 7	44 4	58 10	72 8
Average per passenger-mile ² d.	1.76	1.77	1.78	1.74	1.77	1.74
SECOND-CLASS SINGLE FARES.						
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
New South Wales ¹ ...	3 0	7 4	15 5	23 1	30 0	35 1
Victoria ...	5 4	10 6	21 0	31 2	40 10	50 4
Queensland ...	5 5	9 11	19 0	27 1	34 3	41 6
South Australia ...	5 0	10 0	20 0	30 0	40 0	50 0
Western Australia ...	5 3	10 5	20 10	31 3	41 8	52 1
Tasmania ...	5 0	9 10	19 7	...	...	...
Average ² ...	4 10	9 8	19 4	28 6	37 4	45 10
Average per passenger-mile ² d.	1.16	1.16	1.16	1.14	1.12	1.10

1. Inclusive of suburban rates up to 34 miles. 2. 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 thirteen shillings; in South Australia for 550 miles thirteen shillings and sixpence; in Western Australia fourteen 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. 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 exhibiting a complete analysis of goods rates in the several States. 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 STATE RAILWAYS, 1916.

State.	Charge per Ton in Truck-loads for a Haul of—					
	50 Miles.	100 Miles.	200 Miles.	300 Miles.	400 Miles.	500 Miles.
New South Wales ...	s. d. 5—6	s. d. 8 3	s. d. 10 5	s. d. 11 7	s. d. 12 6	s. d. 13 2
Victoria ...	5 6	8 9	11 6	13 4	15 0	16 8
Queensland ...	4 10	9 2	11 0	12 0	13 0	14 0
South Australia ¹ ...	6 9	9 8	14 3	18 10	23 5	28 0
Western Australia ...	6 3	8 11	12 1	17 0	22 0	24 0
Tasmania ...	6 9	9 8	13. 0	...	...	...
Average ² ...	5 11	9 1	12 1	14 7	17 2	19 2
Average per ton-mile ²	d. 1.42	1.09	0.73	0.58	0.52	0.46

1. Wheat is carried at a lower rate than that specified above for agricultural produce.
2. 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 STATE RAILWAYS, 1916.

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. 27 10	s. d. 54 4	s. d. 94 8	s. d. 119 11	s. d. 130 0	s. d. 140 1
Victoria ...	22 6	44 3	83 6	114 3	140 6	166 9
Queensland ...	44 2	80 7	145 2	¹ 209 9	² 242 0	² 255 7
South Australia ...	27 1	52 1	97 11	134 7	166 8	194 2
Western Australia ...	41 1	71 1	125 10	171 9	209 4	240 8
Tasmania ...	33 9	54 0	100 0	...	...	...
Average ² ...	32 9	59 5	107 10	150 1	177 7	199 5
Average per ton-mile ²	d. 7.86	7.13	6.47	6.00	5.33	4.79
LOWEST-CLASS FREIGHT.						
New South Wales ...	s. d. 2 6	s. d. 4 7	s. d. 6 0	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 10	9 2	15 9	20 1	24 6	28 10
South Australia ...	3 4	6 3	10 0	12 4	14 0	15 8
Western Australia ...	5 0	8 4	14 2	19 2	23 4	27 6
Tasmania ...	5 0	6 9	8 3	...	...	...
Average ² ...	4 2	7 0	10 8	14 3	17 0	19 10
Average per ton-mile ²	d. 1.00	0.84	0.64	0.57	0.51	0.48

1. Maximum freight on highest class goods to Western stations is 200 shillings per ton.
2. Exclusive of Tasmania for hauls of 300 miles and upwards.

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

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

18. Numbers and Description of Rolling Stock, 1916.—The following table shews the rolling stock in use on the State Government railways in each State, classified according to gauge:—

ROLLING STOCK ON STATE GOVERNMENT RAILWAYS IN EACH STATE, CLASSIFIED ACCORDING TO GAUGE, 1915-16.

STATE.	GAUGE.					Total.
	5 ft. 3 in.	4 ft. 8½ in.	3 ft. 6 in.	2 ft. 6 in.	2 ft. 0 in.	
LOCOMOTIVES.						
New South Wales	...	1,211	...	...	...	1,211
Victoria	1,791	...	...	17	...	808
Queensland	...	...	641	...	4	645
South Australia	244	...	226	...	...	470
West Australia	...	...	424	...	...	424
Tasmania	...	...	73	...	7	80
Total	1,035	1,211	1,364	17	11	3,638
PASSENGER VEHICLES.						
New South Wales	...	1,626	...	...	...	1,626
Victoria	1,542	...	...	34	...	1,576
Queensland	...	...	738	...	7	745
South Australia	369	...	136	...	...	505
West Australia	...	...	378	...	...	378
Tasmania	...	...	167	...	6	173
Total	1,911	1,626	1,419	34	13	5,003
VEHICLES, OTHER THAN PASSENGER.						
New South Wales	...	22,179	...	...	...	22,179
Victoria	19,527	...	...	248	...	19,775
Queensland	...	...	13,598	...	83	13,681
South Australia	4,047	...	5,449	...	...	9,496
West Australia	...	...	10,081	...	...	10,081
Tasmania	...	...	1,710	...	77	1,787
Total	23,574	22,179	30,838	248	160	76,999

¹ Including three motor coaches, one steam and two gasoline. ² Including one gasoline motor coach. ³ Including five rail motors. ⁴ Including three motor coaches, two steam and one gasoline.

19. **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 1911 to 1916 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 1916, the total for the Commonwealth has increased from 42,270 to 93,576—an increase of 51,306, or over 121 per cent. The largest numerical increase for the individual States was that of New South Wales, viz., 25,663.

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.

**STATE RAILWAYS.—NUMBER OF EMPLOYEES IN RAILWAY DEPARTMENTS,
1901 and 1911-16.**

State.	1900-1.		1911-12.		1912-13.		1913-14.		1914-15.		1915-16.	
	Salaried Staff.	Wages Staff.	Salaried Staff.	Wages Staff.	Salaried Staff.	Wages Staff.	Salaried Staff.	Wages Staff.	Salaried Staff.	Wages Staff.	Salaried Staff.	Wages Staff.
New South Wales ...	1,372	11,747	2,977	25,084	3,180	28,566	3,422	31,810	3,649	33,096	4,148	34,634
Victoria ...	1,432	10,524	2,243	19,910	2,471	21,115	2,598	22,169	2,661	24,314	2,428	20,500
Queensland ...	994	4,633	1,877	7,131	2,136	8,114	2,301	8,502	2,403	8,286	2,889	9,877
South Australia ...	...	3,855	...	8,569	...	8,754	...	8,995	...	10,182	...	10,460
Western Australia ...	876	5,407	935	6,627	1,016	6,734	1,079	6,913	1,054	7,093	1,011	6,204
Tasmania ...	178	1,252	200	1,147	204	1,131	224	1,180	218	1,277	222	1,203
All States ...	4,852	37,418	8,232	69,368	9,007	74,414	9,624	79,569	9,985	84,248	10,698	89,878

1. Exclusive of gate-keepers with free house only. 2. Separate returns for salaried and wages staffs are not available; the number of salaried staff is included with the wages staff.

20. **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 1911-12 to 1915-16 inclusive:—

**STATE RAILWAYS.—TOTAL NUMBER OF PERSONS KILLED AND INJURED,
1901 and 1911-16.**

State.	1900-1.		1911-12.		1912-13.		1913-14.		1914-15.		1915-16.	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
New South Wales ...	1	1	68	513	84	582	112	570	78	645	87	710
Victoria ...	45	371	67	362	36	723	45	473	48	409	54	360
Queensland ...	13	100	25	235	27	349	32	454	30	102	26	181
South Australia ...	8	50	16	185	18	224	19	202	20	172	14	193
Western Australia ...	25	205	20	121	15	139	25	154	14	131	18	131
Tasmania ...	1	8	...	37	...	43	1	42	...	39	10	89
All States ...	...	...	196	1,453	180	2,060	234	1,895	190	1,498	209	1,664

1. Not available. 2. Including all accidents which occurred on railway premises as well as those caused through train accidents and movement of rolling stock.

(D) 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 1860 onwards. To this end the graphs shewn on pages 646 to 648 have been prepared. The distribution of the railways is shewn on the map on page 645.

2. **Capital Cost and Mileage Open** (page 646).—The graph shows that the ratio between these elements was, naturally enough, very variable from 1860 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 from 1860 are clearly indicated by the graph on page 646. 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 1885—when it reached £10,074 per mile—rose to £10,244 in 1886, then fell slowly till 1888, when it amounted to £10,092 per mile. Again rising, this rate attained to £10,481 in 1892, since when it has, on the whole, been declining, reaching its lowest value, £9468, in 1911. In 1912, 1913, and 1914 it rose to £9545, £9666, and £9820 respectively, but fell in 1915 to £9632. In 1916 it rose to £9893.

4. **Gross Revenue.**—This graph (page 646) exhibits considerable irregularities, the most striking of which are the maxima at 1892, 1902, 1914 and 1916. 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, and there has been a continuous rise up to the year 1914. In 1915, there was a fall amounting to £1,016,421. In 1916, the increase over 1915 was £1,260,646.

5. **Working Expenses and Net Revenue.**—The characteristics of these graphs (page 647), are similar to those of "Gross Revenue," and the same remarks apply. It may be noted, however, that the working expenses are increasing at a faster rate than gross and net revenue.

6. **Percentage of Working Expenses on Gross Revenue.**—This is shewn for each State and for the Commonwealth, from the year 1855, on page 648. 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 up to 1915. In 1916 the percentage slightly declined. 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 and States, from the year 1855, this graph is shewn on page 647. 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. Maxima were reached in 1865, 1877, 1881, 1907, and 1911—viz., 3.44, 3.71, 4.12, 4.37 and 4.46 per cent. Since 1911 there has been, with one exception in 1914, a continuous fall.

For the individual States the results are in general very satisfactory up to the year 1914, every State being able to record an increase over the previous year, with the exception of Tasmania, the figures for that State, however, having only once been exceeded, viz., in 1913. In 1914-15 the rates fell in each State with the exception of Queensland. This was mainly due to the effects of the drought experienced during this period. In 1916 the rates in Victoria, South Australia and Western Australia improved, while the rest of the States shewed falls in their percentages.

The remarkable maximum for Western Australia in 1896 is consequent upon the large use made of the 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:—

STATE 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

While the sinister influence of the drought of 1902 is strikingly shewn in the curves (a) by the fall in the gross and net revenue in 1902-3, (b) by the fall in the percentage of net revenue on capital cost, and (c) by the increase of working expenses on gross revenue, the rapidity of recovery is even more striking, and goes to indicate the great elasticity of the economic condition of the Commonwealth. Although the percentage of net revenue on capital cost during the year 1915-16 has been exceeded in previous years, nevertheless it is satisfactory that the State Government 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 £197,158,588 for construction and equipment up to the 30th June, 1916, should yield a return of no less than 3.06 per cent.

(E)—**Government Railways Generally.**

1. **Rolling Stock.**—In the following tables particulars of the numbers of the rolling stock employed on both the Federal and State Government Railways are set out, classified according to gauge, as at the 30th June in the years 1901, 1906, 1911, and 1916 respectively, together with the percentage of the numbers for each gauge on the total for the mainland. For geographical reasons the figures for Tasmania are shewn separately from those for the mainland.

ROLLING STOCK EMPLOYED ON THE FEDERAL AND STATE RAILWAYS AS AT 30th JUNE, 1901, 1906, 1911, and 1916.

LOCOMOTIVES.

Gauge.	1901.		1906.		1911.		1916.	
	No.	%	No.	%	No.	%	No.	%
Mainland—								
5 ft. 3 in.	692	35.36	663	30.48	705	26.82	1,035	28.69
4 " 8½ "	495	25.29	655	30.12	903	34.35	1,249	34.62
3 " 6 "	765	39.09	850	39.08	1,011	38.45	1,303	36.11
2 " 6 "	5	0.26	7	0.32	10	0.38	17	0.47
2 " 0 "	...	...	...	...	...	...	4	0.11
Total	1,957	100.00	2,175	100.00	2,629	100.00	3,608	100.00
Tasmania—								
3 ft. 6 in.	64	...	69	...	72	...	73	...
2 " 0 "	7	...	7	...	7	...	7	...
Grand total ...	2,028	...	2,251	...	2,708	...	3,688	...

ROLLING STOCK EMPLOYED ON THE FEDERAL AND STATE RAILWAYS
(Continued).

PASSENGER VEHICLES.

Gauge.	1901.		1906.		1911.		1916.	
	No.	%	No.	%	No.	%	No.	%
Mainland—								
5 ft. 3 in.	1,358	49.58	1,438	47.59	1,597	42.41	1,911	39.45
4 " 8½ "	610	22.27	713	23.59	1,136	30.16	1,636	33.77
3 " 6 "	761	27.78	859	28.42	1,012	26.87	1,256	25.93
2 " 6 "	10	0.37	12	0.40	21	0.56	34	0.70
2 " 0 "	...	...	...	...	...	...	7	0.15
Total ...	2,739	100.00	3,022	100.00	3,766	100.00	4,844	100.00
Tasmania—								
3 ft. 6 in.	163	...	176	...	170	...	167	...
2 " 0 "	8	...	6	...	6	...	6	...
Grand total ...	2,910	...	3,204	...	3,942	...	5,017	...

VEHICLES, OTHER THAN PASSENGER.

Gauge.	1901.		1906.		1911.		1916.	
	No.	%	No.	%	No.	%	No.	%
Mainland—								
5 ft. 3 in.	12,209	31.06	13,282	29.90	15,451	27.82	23,574	30.96
4 " 8½ "	11,540	29.35	13,010	29.29	17,112	30.81	22,865	30.03
3 " 6 "	15,481	39.38	18,026	40.59	22,793	41.03	29,380	38.58
2 " 6 "	82	0.21	99	0.22	190	0.34	248	0.32
2 " 0 "	...	...	...	...	...	...	83	0.11
Total ...	39,312	100.00	44,417	100.00	55,546	100.00	76,150	100.00
Tasmania—								
3 ft. 6 in.	1,389	...	1,525	...	1,618	...	1,710	...
2 " 0 "	50	...	61	...	71	...	77	...
Grand total ...	40,751	...	46,003	...	57,235	...	77,937	...

In the fifteen years under review the percentages of the numbers of locomotives for each gauge on the total number of locomotives on all Government railways on the mainland have undergone the following changes: on the 5 ft. 3 in. gauge the percentage has fallen by 6.67 per cent., the 4 ft. 8½ in. gauge increased by 9.33, and the 3 ft. 6 in. gauge fallen by 2.98 per cent.

As regards passenger vehicles the alterations are as follow: on the 5 ft. 3 in. gauge the percentage has fallen by 10.13 per cent., the 4 ft. 8½ in. gauge increased by 11.50 and the 3 ft. 6 in. gauge fallen by 1.85 per cent.

In the case of vehicles other than passenger the changes have been small, the 5 ft. 3 in. gauge percentage having fallen 0.10, the 4 ft. 8½ in. gauge risen by 0.68 and the 3 ft. 6 in. gauge fallen by 0.80 per cent.

2. **Railway Mileage Open for Traffic.**—The Government railway mileages open for traffic, classified according to gauge, as at the 30th June in each of the years 1901, 1906, 1911, and 1916, are set out in the following table, which gives as well the percentages of each mileage on the total on the mainland, the figures for Tasmania being shewn separately, as in the case of the last tables relating to rolling stock:—

RAILWAY (ROUTE) MILEAGES OF STATE AND FEDERAL RAILWAYS, CLASSIFIED ACCORDING TO GAUGE, AS AT 30th JUNE, IN EACH OF THE YEARS 1901, 1906, 1911, and 1916, WITH PERCENTAGES ON TOTAL FOR MAINLAND.

Gauge.	1901.		1906.		1911.		1916.	
	Miles.	%	Miles.	%	Miles.	%	Miles.	%
Mainland—								
5 ft. 3 in.	3,696	30.49	3,849	28.67	4,023	25.77	4,955.44	24.56
4 " 8½ "	2,806	23.15	3,350	24.96	3,721	23.84	4,925.92	24.41
3 " 6 "	5,571	45.96	6,172	45.98	7,742½	49.61	10,143.21	50.28
2 " 6 "	48	0.40	53	0.39	122	0.78	121.90	0.60
2 " 0 "	...	...	...	...	...	...	29.35	0.15
Total ...	12,121	100.00	13,424	100.00	15,608½	100.00	20,175.82	100.00
Tasmania—								
3 ft. 6 in.	439	...	440	...	446	...	537.75	...
2 " 0 "	19	...	23	...	24	...	24.50	...
Grand total	12,579	...	13,887	...	16,078½	...	20,738.07	...

From the above table it will be seen that in the fifteen years from 1901 to 1916 the 5-ft. 3-in. gauge percentage has fallen by 5.93 per cent., the 4-ft. 8-in. gauge increased by 1.26 per cent., and the 3-ft. 6-in. gauge increased by 4.32 per cent.

3. **Summary of Working of Federal and State Government Railways.**—In the following table a summary is given of the working of all Government railways, both Federal and State, for the year ended 30th June, 1916, fuller particulars of which have been given in the sections B and C of this chapter:—

SUMMARY OF THE WORKING OF THE FEDERAL AND STATE GOVERNMENT RAILWAYS FOR THE YEAR ENDED 30th JUNE, 1916.

Total mileage open	...	...	...	...	20,738
Average miles open during the year	...	...	...	...	20,429
Total train mileage	...	...	...	...	59,739,215
Total cost of construction of lines open	...	...	...	...	£205,166,862
Cost per mile	...	...	...	...	£9,893
Gross revenue	...	...	...	...	£22,229,174
Working expenses	...	...	...	...	£16,249,387
Percentage of working expenses on gross revenue	...	...	...	...	73.10
Net revenue	...	...	...	...	£5,979,787
Interest payable (exclusive of Kalgoorlie-Port Augusta and Canberra lines)	...	...	...	...	£7,511,199
Number of passenger journeys	...	...	...	...	1274,549,967
Tonnage of goods and live stock carried	...	...	...	...	127,947,660
Number of employees at 30th June, 1916—					
Salaried	...	...	...	...	10,791
Wages	...	...	...	...	83,880
Number of persons killed and injured during the year through train accidents and movement of rolling stock—					
Killed	...	...	...	...	211
Injured	...	...	...	...	1,637

1. Exclusive of Port Augusta-Oodnadatta line.

(F).—Private Railways.

1. **Total Mileage Open, 1915-16.**—As has been stated in a previous part of this Section (see A. 8) 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, sugar cane, 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 during 1915-16. A classification of these lines according to their gauge has already been given (see page 626).

MILEAGE OF PRIVATE RAILWAYS OPEN, 1915-16.

Particulars.	N.S.W.	Victoria.	Q'land.	'S.A.	W.A.	Tas.	C'wealth.
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
For general traffic ...	179.75	26.00	651.75	...	277.00	163.50	1,298.00
For special purposes ...	124.00	26.00	833.75	34.00	687.50	32.50	1,737.75
Total ...	303.75	52.00	1,485.50	34.00	964.50	196.00	3,035.75

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 1915-16. In this statement the lines inset are sub-branches from the main branches specified.

CLASSIFICATION OF PRIVATE RAILWAYS IN AUSTRALIA, 1915-16.

NEW SOUTH WALES.

Railway Lines.	Length and Gauge.				Nature of Traffic Carried, etc.
	5 ft.3 in.	4 ft. 8 in.	3 ft. 6 in.	2 ft. 0 in.	
	Miles.	Miles.	Miles.	Miles.	
I. BRANCHES FROM NORTHERN LINE.					
N.S.W. GOVT. RLYS.—					
Aberdare Junction to Cessnock	12	...	...	Coal and passengers
" " " E. Greta and Stan-	...	4½	...	...	Coal
ford-Merthyr	8	...	...	Coal and passengers
Hexham-Minni	6	...	...	" " "
Brown's line to Richmond Vale	11½	...	...	Coal " "
Three other sub-branches	5	...	...	" " "
Newcastle-Wallsend Co.'s lines	4½	...	...	" " "
Five sub-branches	4	...	...	" " "
Waratah Coal Co.'s line	4½	...	...	" " "
Old Burwood Pit	7½	...	...	" " "
Gunnedah Coal Co.'s line	4½	...	...	" " "
Other branches	27	...	...	Coal, coke, ores & stone
Total	99½	...	...

CLASSIFICATION OF PRIVATE RAILWAYS IN AUSTRALIA, 1916, (Continued).
NEW SOUTH WALES (Continued).

Railway Lines.	Length and Gauge.				Nature of Traffic Carried, etc.
	5ft.3in.	4ft.8½in.	3ft.6in.	2ft.0in.	
2. BRANCHES FROM NORTH-COAST LINE GOVT. RAILWAYS—					
New Redhead Coal Co.'s lines, Adams-town to Burwood Extended, and Dudley lines	7½	...	...	Coal and passengers
Seaham Coal Co.'s lines, Cockle Creek to West Wallsend and Seaham collieries	6	...	...	Coal " "
Nine other branches	9	...	...	Coal " "
Total	22½	...	...
3. BRANCHES FROM SOUTHERN LINE, N.S.W. GOVT. RLYS.—²					
Liverpool-Warwick Farm	3	...	...	Racecourse traffic
Goondah-Burrinjuck ²	26½	General & materials for construction of dam
4. BRANCHES FROM S. COAST LINE, N.S.W. GOVT. RLYS.—³					
Mount Kembla Coal Co.	7½	...	...	Coal
Corrimal and Balgownie	3½	...	...	"
Australian Smelting Co., Dapto	2½	...	...	Ores
Mount Keira Coal Co., Belmore Basin	3	...	...	Coal
Nine other branches	14	...	...	"
Mount Pleasant Coal Co.	3½	...	"
Total	30½	3½	...	
5. BRANCHES FROM WESTERN LINE, N.S.W. GOVT. RLYS.—					
Commonwealth Oil Corporation's line from Newnes Junction	33	...	...	General
Eleven other branches	6½	...	...	Coal, metal, and ores
Total	39½	...	...
6. SILVERTON TRAMWAY—					
Broken Hill and Cockburn	36	...	General
7. DENILQUIN-MOAMA LINE					
... ..	45	...	...	...	"
Total for State	45	193	39½	26½	

1. Three other branch private lines having a total length of 24 miles have been constructed for the conveyance of minerals, but are now closed. 2. Owned and worked by the Public Works Department. 3. The Illawarra Harbour and Land Corporation's line, 6½ miles long, constructed for general traffic is not now working.

VICTORIA.

Railway Lines.	Length and Gauge.		Nature of Traffic Carried, etc.
	5ft. 3in.	3ft. 0in.	
1. KERANG TO KOONBROOK TRAMWAY	Miles.	Miles.	General
2. ALTONA BAY RAILWAY—	14	...	
Williamstown racecourse and pit at Altona	3	...	Timber and coal
3. McIVOR TIMBER AND FIREWOOD CO., TOOBORAC	23	...	Firewood
4. YARRA JUNCTION TO POWELLTOWN ... ..	...	12	General
Total for State... ..	40	12	

CLASSIFICATION OF PRIVATE RAILWAYS IN AUSTRALIA, 1915-16 (Continued).

QUEENSLAND.

Railway Lines.	Length and Gauge.			Nature of Traffic Carried, etc.
	3 ft. 6 in.	2 ft. 6 in.	2 ft. 0 in.	
BRANCHES FROM GOVERNMENT RAILWAYS—				
1. SOUTH-COAST LINE—	Miles.	Miles.	Miles.	
Beaudesert Tramway to Rathdowney and Tabooba Junction to Lamington...	33	...	11	General Sugar
Nerang Central Mill ...	...	...	...	Mineral
Blue Metal Co. ...	2½	...	...	Timber
Lahey's Ltd. from Canungra ...	14½	...	...	General
Belmont Shire Council ...	4½	...	...	Sugar
Australian Meat Export Co. ...	½	...	...	Live stock & meat
2. MAIN LINE—				
Mount Crosby Water Supply (Tivoli) ...	5	...	...	Water Conserva- tion
Fourteen Colliery Branches ...	12½	...	...	Coal
Two Timber Branches ...	3½	...	...	Timber
Redbank Freezing Works ...	...	...	½	Meat
Marburg Sugar Mill ...	1	...	...	Sugar
Three Branch Lines ...	½	...	...	Various
3. SOUTHERN LINE AND BRANCHES—				
Tannymorell Colliery ...	3½	...	...	Coal
Queensland Cement and Lime Co. ...	4	...	...	Limestone
4. WESTERN LINE AND BRANCHES—				
Three Colliery Branches ...	1½	...	...	Coal [produce
Munro's Tramway to Perseverance ...	...	10	...	Timber and farm
Pechey's Siding ...	½	...	...	Timber
5. NORTH-COAST LINE—				
Buderim Tramway ...	...	7	...	General
Mapleton Tramway ...	...	...	15	"
Moreton Central Sugar Mill ...	...	...	12	"
Mount Bauple Sugar Mill ...	9½	...	8	Sugar
Goodwood Sugar Mill ...	...	...	2½	"
Millaquin Sugar Mill and Refinery ...	2½	...	9½	General
Woongarra Tramway ...	12½	...	...	"
Qunaba Sugar Mill ...	...	...	10½	Sugar
Doolbi Sugar Mill ...	...	...	14	"
Isis Central Sugar Mill ...	3	...	14½	"
Childers Sugar Mill ...	...	...	33½	"
Fairymead Sugar Mill ...	6½	...	2½	"
Avondale Sugar Mill ...	3½	...	...	"
Invicta Sugar Mill ...	8½	...	14½	General and sugar
Bingera Sugar Mill ...	6½	...	26½	Sugar
Gin Gin Sugar Mill ...	...	...	22½	"
Three Colliery Lines ...	3½	...	...	Coal
Twelve Branch Lines ...	4½	...	½	Various
6. CENTRAL LINE AND BRANCHES—				
Mount Morgan G.M. Co. ...	5	...	...	Minerals
Two Colliery Branches ...	2	...	...	Coal
Aramac Tramway from Barcaldine ...	41	...	...	General
Eight Branch Lines ...	5	...	...	Various
7. MACKAY LINE AND BRANCHES—				
Racecourse Central Mill ...	½	...	5	Sugar
Palms Sugar Mill ...	½	...	10	"
Pleystowe Central Mill ...	1	...	35	"
Marian Central Mill ...	½	...	37½	"
Cattle Creek Central Mill ...	...	...	5	"
North Eton Central Mill ...	...	...	21	"
Homebush Sugar Mill ...	...	...	29	"
Farleigh Sugar Mill ...	...	...	40	"
Plane Creek Central Mill ...	...	...	44½	"
Mackay Harbour Board ...	2	...	...	General
8. BOWEN LINE—				
Proserpine from Bowen ...	38½	...	...	General
Proserpine Central Mill ...	...	...	50	Sugar and cane
9. GREAT NORTHERN RAILWAY—				
Kalamia Sugar Mill ...	...	...	17½	Sugar
Pioneer and Inkerman Sugar Mills ...	38½	...	18½	" [rals
Macgregor Tramway to Ballara ...	22½	...	...	General and mine-
Three Meat Preserving Co.'s Lines ...	4½	...	...	Meat & live stock
Fourteen Mineral Branches ...	19	...	4	Minerals
Two Branch Lines ...	1½	...	...	Various
10. CAIRNS LINE AND BRANCHES—				
Hambledon Sugar Mill ...	1½	...	37½	Sugar
Mulgrave Central Mill ...	1½	...	15½	" etc.
Babinda Sugar Mill ...	...	...	27	"
Chillagoe Railway ...	102½	...	...	General
Stannary Hills Tramway ...	...	...	21	"
Irvinebank Tramway ...	...	...	14	"
Etheridge Railway ...	142½	...	...	"
Three Branch Lines ...	5	...	...	Various

CLASSIFICATION OF PRIVATE RAILWAYS IN AUSTRALIA, 1915-16 (Continued).
QUEENSLAND (Continued).

Railway Lines.	Length and Gauge.			Nature of Traffic Carried, etc.
	3 ft. 6 in.	2 ft. 6 in.	2 ft. 0 in.	
11. GERALDTON-MOURILYAN LINE—	Miles.	Miles.	Miles.	
Goondi Sugar Mills ... ..	...	...	35½	Sugar
South Johnstone Sugar Mill ... ..	...	...	35½	"
Mourilyan Sugar Mill ... ..	...	...	21	"
Lines not connected with Govt. Railways—				
Victoria Sugar Mill (Ingham) ... ..	...	...	69½	General and sugar
Macnade Sugar Mill do ... ..	...	...	52½	" " "
Port Douglas to Mossman & Mowbray River ... ..	...	...	19	General " "
Mossman Central Mill ... ..	...	...	24	General and sugar
Total for State	582½	17	886½	

SOUTH AUSTRALIA.

Railway Line.	Length and Gauge.		Nature of Traffic Carried, etc.
	3 ft. 6 in.		
BROKEN HILL PROPRIETARY Co.'s LINE— Iron Knob to Hummock's Hill, Spencer's Gulf	Miles. 34		Carriage of ironstone.

WESTERN AUSTRALIA.¹

Railway Lines.	Length and Gauge.			Nature of Traffic Carried, etc.
	3ft.6 in.	2ft.0 in.	1ft.8 in.	
1. MIDLAND RAILWAY— Joining Govt. lines at Midland Junction & Walkaway	Miles. 277	Miles. ...	Miles. ...	General
2. W.A. GOLDFIELDS FIREWOOD SUPPLY Co.'s LINE— From Kurrawang into bush	102	...	...	Firewood
3. KALGOORLIE AND BOULDER FIREWOOD Co.'s LINE— Goodwood railway, from Lake Side into bush	33	...	...	"
Lancefield railway into bush ... ..	...	34	...	"
4. W.A. TIMBER AND FIREWOOD Co. LTD. LINE— Kurramia railway, from Kalgoorlie-Kanowna railway to bush	66	...	...	"
5. SONS OF G'WALIA GOLD MINING Co.'s LINE— Railway into bush ... ..	...	...	29	"
6. MURCHISON FIREWOOD Co.'s LINE— Nallan wood railway, from Nallan siding to bush	28½	...	...	"
7. W.A. JARRAH SAWMILLS LINE— From Kirupp to mills and into bush	34	...	...	Timber
8. TIMBER CORPORATION Co.'s LINE— From Greenbushes to mills and into bush	17½	...	...	"
9. S.-WEST TIMBER HEWERS' Co-OP. SOCIETY'S LINE— From Holyoake into bush	9½	...	...	"
10. MILLAR'S TIMBER TRADING Co.'s LINES— Upper Darling Range railway, from Pickering Brook to Canning mills and bush	12	...	...	"
Jarrahdale and Rockingham railway, from Mundijong to Rockingham and bush	54	...	...	"
Yarloop railway to mills and bush	54½	...	...	"
Mornington mills rly., from Wokalup to mills & bush	40½	...	...	"
Ferguson River railway, from Dardanup to mills and into bush	41	...	...	"
Kirupp saw mills into bush	26	...	...	"
Marrinup saw mills into bush	9	...	...	"
Jarrah woods saw mills into bush	15	...	...	"
11. BUNNING BROS. LTD. LINES— From Lion Mill, Argyle, Cardiff & Preston Valley to bush	38½	...	...	"
12. NORTH DANDALUP S.M. RAILWAY— To mill and bush	12	...	...	"
13. SWAN SAW MILL RAILWAY— From Lowden to mill and bush	11	...	...	"
14. BUCKINGHAM BROS. S.M. RAILWAY— From Muja to bush	4½	...	...	"
15. WILGARRUP KARRI AND JARRAH Co.'s LINE— Railway into bush	8	...	...	"
16. WEIM CREEK RAILWAY TO BALLA BALLA ... ..	...	14	...	Copper ore
Total for State... ..	893½	48	23	

1. To the 31st December, 1915, exclusive of those worked with horses.

CLASSIFICATION OF PRIVATE RAILWAYS IN AUSTRALIA, 1915-16 (Continued).

TASMANIA.

Railway Lines.	Length and Gauge.		Nature of Traffic Carried, etc.
	3ft. 6in.	3ft. 0in.	
	Miles.	Miles.	
1. EMU BAY RAILWAY Co.'s LINES—			
Burnie to Waratah	103½	...	General
Guildford to Zeehan			
Rayna to Dundas			
2. MOUNT LYELL MINING AND RAILWAY Co.'s LINES—			
Strahan to Queenstown	22	...	"
Gormanston to Kelly Basin	28	...	"
3. HUDON TIMBER Co.'s LINE	130	...	Timber
4. ZEEHAN TRAM Co.'s LINE—			
Emu Bay railway to British Queen ... ..	...	2½	Minerals and occasionally passengers
5. MAGNET SILVER MINING Co.'s LINES—			
Magnet Junction to Magnet ... ..	...	10	Minerals and passengers
Total for State... ..	183½	12½	

I. Approximate.

3. New South Wales.—In this State the mileage of private railways open to the public for general traffic at the end of 1915 was 179.75, and of lines used for special purposes, 124 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 1915 of the operations of lines open for general traffic are given, so far as available, in the table on page 675.

(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 Lines.* These lines, belonging to the East Greta Coal Mining Company, run from East Greta Junction, on the Northern line of the Government railways, to Stanford Merthyr, a distance of 8 miles, and from Aberdare Junction to Cessnock, 12 miles—a total of 20 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 7½ miles. The lines are worked by the Railway Department, coal wagons 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 Railway.* This line runs from Cockle Creek to West Wallsend and Seaham Collieries, and has a total length of 6 miles. (f) *Hexham-Minni Railway.* This line branches from the Northern line of the Government railways and has a length of 6 miles. (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 33 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. (i) *The Goondah-Burrinjuck Line* is a line 26.25 miles in length built and worked by the Public Works department in connection with the dam in course of construction at Burrinjuck.

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 there are two private railways open for general traffic. (a) Kerang-Koondrook tramway, opened in 1889. The cost of construction of this line to the end of September, 1916, was £39,449, paid out of a loan advanced by the Victorian Government. The total length is 14 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. (b) Yarra Junction to Powelltown. This line has a length of 12 miles, and is worked mainly for timber purposes.

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 or for the transport of sugar-cane, and (ii.) Shire tramways.

(i.) *Mining Railways.* (a) *The Chillagoe Railway.* The most important of these is the Chillagoe railway, constructed under the Mareeba to Chillagoe Railway Act 1897, and opened in 1901. This line runs from Mareeba, on the Cairns railway, to Mungana, a distance of 102.75 miles. (b) *The Stannary Hills Line.* This line branches from the Chillagoe railway at Boonmoo and runs to Rocky Bluff, *via* Stannary Hills, a total distance of 21 miles. The gradients on this line, which has a gauge of 2 feet, range as high as 1 in 27, while the radius of some of the curves is as low as $1\frac{1}{4}$ chains. An additional length of 8 miles has been surveyed with a view to extending the line.

(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 ore for use in connection with the smelting works at Port Pirie and the steel works at Newcastle.

7. **Western Australia.**—Owing to the Government's past difficulty in constructing lines urgently required for the development of the country, private enterprise was encouraged to undertake the work of construction on the land-grant principle, and two trunk lines were thus constructed. The greater part of the private lines now open, however, have been constructed in connection with the timber industry. (i.) *The Midland Railway.* This line is 277 miles in length, and runs from the Midland Junction, ten miles from Perth, to Walkaway, where it joins the Government line running to Geraldton. It was constructed under a concession of 12,000 acres of land per mile of line constructed, to be selected along the entire route of the railway. (ii.) *The Great Southern Railway.* This line, which was built by private enterprise under the land-grant system, is 242 miles in length, and was acquired by the Government by purchase on the 1st January, 1897. The total price paid, with all the interests of the private company and of the original concessionaire, was £1,100,000, which was divided by the Government for book-keeping purposes into £300,000 for the land and £800,000 for the railway. (iii.) *Millar's Timber Trading Company's Lines.* These lines have mostly been built under special timber concessions and leases. There were, at latest date available, in all nine 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 252 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 671.

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 103½ 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, 28 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, 1915-16.**—The tabular statement given below shews particulars, so far as returns are available, for the year 1915-16, of all private railways open to the public for general traffic in the Commonwealth:—

PARTICULARS OF PRIVATE RAILWAYS OPEN FOR GENERAL TRAFFIC, 1915-16.

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.	Other Vehicles.
	No.	£	£	£	£	No.	No. '000.	Tons '000.	No.	No.	No.	No.
NEW SOUTH WALES.												
Deniliquin-Moama	45	162,672	20,744	11,845	2...	39,814	12	47	49	4	6	63
Silverton Tramway	36	473,163	132,145	63,949	2...	108,972	43	721	220	20	1	676
East Greta Railway	20	194,035	61,225	51,089	9,702	402,591	872	53	220	19	28	40
Seaham Colliery Co.	6	25,000	875	700	2...	7,643	17	9	10	7	2	2
New Redhead Co.	7½	102,000	54,584	52,121	51,882	2...	2...	2...	512	3...	3...	3...
Hexham-Minmi ...	6	2...	654	603	2...	10,560	9	1	6	1	4	1
Cwllth. Oil Corp'n	33	194,500	3,207	3,364	2...	13,665	1	5	7	7	2	95
Goond' h-Burrin' k ^a	26½	80,756	3,691	78,452	...	37,706	5	9	32	4	3	28
Total ¹	179½	1,232,126	227,125	142,123	11,584	620,951	959	845	556	62	46	905
VICTORIA.												
Kerang-Koondrook	14	39,449	2,977	2,204	1,682	18,978	10	10	11	2	2	9
Yarra J. Powelltown	12	45,350	2,760	2,411	465	25,000	9	35	11	2	2	28
Total ¹	26	84,799	5,737	4,615	2,147	43,978	19	45	22	4	4	37
QUEENSLAND.												
Chillagoe Railway	103	420,276	29,355	14,070	2...	52,555	15	28	59	8	2	89
Stannary Hills ...	21	65,320	2,561	2,515	2...	8,346	1	7	5	1	2	76
Invicta Mill	8½	19,446	952	684	1,003	1,615	1	9	3...	3...	3...	37
Beaudesert	33	91,295	8,992	6,182	3,599	33,416	14	15	30	1	4	2
Douglas-Mossman ...	17	43,600	3,428	7,506	2...	12,000	9	8	16	2	3	24
Lucinda Pt. to Stone R. and Lg. Pocket	53½	2...	2...	2...	2...	25,000	2...	2...	2...	3	3	20
Green Hills to Hambleton Junc.	4½	2...	2...	2...	2...	2...	2...	2...	2...	2...	2...	2...
Bowen-Proserpine	38½	104,649	5,639	3,173	1,853	10,236	9	11	9	3...	3...	3...
Woongarra	14½	35,848	3,092	3,327	2...	5,078	36	27	4	3...	3...	3...
Mt. Molloy Tr'm'w'y	20	42,000	2,043	2,025	...	8,872	1	4	8	1	3...	7
Belmont Tramway	4	21,458	2,760	1,636	1,339	9,756	27	22	3...	3...	3...	3...
Aramac-Barcaldine	42	85,424	11,761	6,860	4,155	27,566	7	18	16	2	2	1
Etheridge ^b	143	457,175	10,853	10,620	11,250	17,722	3	3	3...	3...	3...	3...
Total ¹	502½	1,386,491	81,436	58,648	23,199	212,162	123	152	149	18	16	219
WESTERN AUSTRALIA.												
Midland Railway ...	277	2,036,855	88,021	60,224	...	309,681	55	78	227	17	20	400
TASMANIA.												
Emu Bay Railway...	103½	611,098	39,263	17,481	20,339	88,555	30	27	93	10	10	151
Mt. Lyell Railway...	22	216,086	27,988	19,967	2...	47,268	21	90	78	7	7	129
Nth. Mt. Lyell Rly.	28	316,638	4,424	7,073	2...	10,780	5	16	18	4	3	54
Magnet Railway ...	10	18,750	283	2,143	2...	7,280	1	...	9	3	1	8
Total ¹	163½	1,162,572	71,958	46,664	20,333	153,883	57	133	198	24	21	342
Total for Cwllth. ⁴	1,148½	3,902,843	474,277	312,274	57,263	1,340,655	1,213	1,253	1,152	125	107	1,903

1. Incomplete. 2. Not available. 3. Worked by Government railways. 4. Including one motor car. 5. For year 1914. 6. Exclusive of coal. 7. Including interest. 8. For year ended 30th June, 1916. 9. These figures do not agree with those on pp. 625-626 ante; the latter being based on a later return which includes certain additional lines.

§ 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 lines which are used for special purposes, usually in connection with the timber, mining, or milling industries. These lines are usually termed tramways, but they are really private railways, the traffic on which has nothing in common with that of a street tramway used for the conveyance of passengers. 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 for the year 1915-16, classified (a) according to the motive power utilised and (b) according to the nature of the authority by which the lines are controlled:—

TRAMWAYS.—CLASSIFICATION OF MILEAGE OPEN FOR PASSENGER TRAFFIC, 1915-16.

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	151.05	85.01	40.45	54.42	52.98	21.95	405.86
Steam	73.27	1.00	6.00	...	...	22.25	102.52
Cable ... ..	...	45.93	...	...	...	...	45.93
Horse ... ..	...	...	...	123.31	28.96	8.00	60.27
Total	224.32	131.94	46.45	77.73	81.94	52.20	614.58

ACCORDING TO CONTROLLING AUTHORITY.

Government	220.82	5.16	...	119.86	56.30	27.75	329.89
Municipal ... ..	...	45.10	6.00	57.87	10.89	21.95	141.81
Private	3.50	81.68	40.45	...	14.75	2.50	142.88
Total	224.32	131.94	46.45	77.73	81.94	52.20	614.58

1. 17.35 miles included in South Australian Government railway mileage.

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, 1916, seven such systems in operation within the metropolitan area, the most important being the city and suburban lines, 111.21 miles in length (202.79 miles single track); the North Shore line, 19.39 miles in length

(33.41 miles single track); the Ashfield to Mortlake line, 8.47 miles in length (14.14 miles single track); Manly to the Spit, Brookvale, and Narrabeen, 10.73 miles (14.59 miles single track); and Rockdale to Brighton-le-Sands, 1.25 miles. The last-mentioned line was purchased from a private company and opened for traffic on 7th June, 1914. 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, 5.56 miles in length (6.98 miles single track), and (b) from Arncliffe to Bexley, 2.63 miles long (single track).

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

(a) *Sydney Tramways.* In the early sixties a horse tramway, 1½ miles long, was constructed in Sydney. Owing to the rails being laid higher than the road surface, the inconvenience thus caused to other traffic necessitated its removal, and it was not until September, 1879, that the first steam tramway was opened, running from Bridge-street to Hay-street *via* Elizabeth-street. In the following few years the 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. As already stated the whole of the steam tramways in Sydney and suburbs, with the exception of the Kogarah-Sans Souci and the Arncliffe-Bexley lines, 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.

(b) *Other Tramway Systems.* In Newcastle the first section of the tramways, from Perkins-street to Plattsburg, was opened in December, 1887; the total length open on the 30th June, 1916, was 32.86 miles (42.66 miles single track). At Broken Hill and Parramatta the first sections of the tramways were opened in 1902. On the 30th June, 1916, the mileage open at Broken Hill amounted to 10.05 miles (11.44 miles single track), and at Parramatta to 6.69 miles (single track). The line from East to West Maitland, 4.59 miles long (single track), was opened in February, 1909. 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, 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 1911-16:—

NEW SOUTH WALES.—PARTICULARS OF WORKING OF GOVERNMENT TRAMWAYS, 1901-2 and 1911-16.

Year ended the 30th June.	Total Length of Lines Open (Route).	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	103.94	2,829,363	631,757	541,984	89,773	85.79	3.19
1911-12	195.63	5,664,324 ¹	1,531,393	1,331,413	249,980	84.19	4.41
1912-13	207.88	6,699,305 ¹	1,754,566	1,572,190	182,376	89.61	2.94
1913-14	212.16	7,628,653 ¹	1,934,164	1,669,033	265,131	86.29	3.66
1914-15	219.81	7,970,293 ¹	1,986,060	1,611,287	374,773	81.13	4.70
1915-16	220.83	8,166,423 ¹	1,991,628	1,602,650	388,978	80.47	4.76

1. £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 £302,686 for interest on the capital invested, was a surplus of £86,292 in 1915-16, as compared with a surplus of £90,135 in the preceding year. During the year 1915-16, 292,021,774 passengers were carried, an increase of 2,738,929 as compared with the previous year.

(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 other tramways under Government control.

**NEW SOUTH WALES.—PARTICULARS OF THE WORKING OF THE VARIOUS
GOVERNMENT TRAMWAYS, 1915-16.**

Line.	Length.		Total Cost.	Gross Revenue.	Working Expenses	In- terest.	Profit or Loss. ¹	Percentage of Working Expenses on Gross Revenue.
	Route.	Track.						
	Miles.	Miles.						
Sydney and Suburban—								
Electric... ..	151.05	266.18	7,526,701	1,838,707	1,452,470	279,250	+ 106,987	78.99
Steam	8.19	9.61	49,566	11,812	15,919	1,796	— 5,803	133.92
Total	159.24	275.79	7,576,267	1,850,519	1,468,289	281,046	+ 101,184	79.34
Parramatta Steam	6.69	6.69	38,446	7,779	8,185	1,448	— 1,854	105.22
Sutherland to Cronulla ..	7.40	7.40	49,696	11,178	8,755	1,874	+ 549	78.32
Newcastle ..	32.86	42.66	374,789	103,443	94,479	13,531	— 4,567	91.33
East to West Maitland ..	4.59	4.59	38,941	5,004	5,540	1,468	— 2,004	110.71
Broken Hill ..	10.05	11.44	88,284	13,705	17,402	3,319	— 7,016	126.98
Total	290.83	348.57	8,166,423	1,991,628	1,602,650	302,686	+ 86,292	80.47

1. 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, 1916.**

Permanent Way.	Rolling Stock	Power-house, Sub-stations, and Plant.	Machi- nery.	Work- shops.	Furni- ture.	Store Advances Account.	Total.
£	£	£	£	£	£	£	£
4,031,598	1,807,643	1,788,523	127,083	213,184	2,392	196,000	8,166,423

The average cost per mile open was £18,257 for permanent way and £18,725 for all other charges, making a total of £36,982 per mile.

During the year 1915-16, four new extensions, amounting in all to a length of 1.15 miles, were opened for traffic. On the 30th June, 1916, five extensions, having a total length of 5.39 miles, were under construction.

(e) *Sydney Electric Tramways.* The current for the operation of the city and suburban tramways is generated at the power-house at Ultimo, which has been erected at a total cost of £1,788,523, including the cost of the sub-stations and plant. The total output of the power-house, for both lighting and traction purposes, during the year 1915-16, was

94,352,417 kilowatt-hours, of which the direct-current supply was 690,389, and the alternating current 93,662,028 kilowatt-hours. The following table gives particulars of the working of the electric tramways for the financial years 1911-12 to 1915-16:—

NEW SOUTH WALES.—PARTICULARS OF SYDNEY ELECTRIC TRAMWAYS, 1911-12 to 1915-16.

Year ended 30th June.	Mileage Open for Traffic.		Total Cost of Construction and Equipment.	Current used for Traction Purposes.	Tram Miles Run.	Passengers Carried.
	Route.	Track.				
	Miles.	Miles.	£	Kilowatt-hours	No.	No.
1912 ...	131.70	222.95	5,153,321	70,920,407	23,016,315	250,785,895
1913 ...	141.45	242.69	6,162,063	79,839,867	25,479,802	275,977,634
1914 ...	145.74	252.34	7,054,832	86,187,367	26,973,702	290,547,553
1915 ...	150.04	261.09	7,349,866	81,591,224	25,406,807	269,633,638
1916 ...	151.05	266.18	7,526,701	81,688,434	25,008,055	272,048,293

Year ended 30th June.	Gross Revenue.	Working Expenses.	Net Revenue.	Number of Cars in Use.	Number of Persons Employed.
	£	£	£		
1912 ...	1,460,625	1,209,321	251,304	1,048	8,138
1913 ...	1,616,686	1,433,972	182,714	1,220	9,048
1914 ...	1,781,063	1,520,185	260,878	1,396	9,195
1915 ...	1,834,022	1,469,227	364,795	1,430	8,743
1916 ...	1,838,708	1,452,470	386,238	1,402	9,308

(ii.) *Private Tramways.* 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 $3\frac{1}{2}$ 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. 8 $\frac{1}{2}$ in., was opened for traffic in 1883. In 1915 the number of tram miles run was 18,200, and the number of passengers conveyed 137,720.

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 1915 were received from four companies, and shew that these companies had 70 boats in commission, which were licensed to carry a total of 45,996 passengers, or an average of 657 per boat and per trip. The total number of passengers carried during the year is stated as 36,207,862, an average of 99,200 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 for such traffic between the city and the northern suburbs. The four companies employed during the year a total of 978 persons. The gross revenue during 1915 amounted to £373,873, and the expenditure to £295,939, thus giving a net revenue of £77,934. 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 up to the 1st July, 1916, and since that date by the Melbourne Tramway Board, to which reference will be made further on. There are also five lines of electric tramways, viz.:—(a) St. Kilda to Brighton belonging to the Government and under the control of the Railway Commissioners; (b) Flemington Bridge to the Saltwater River and Keilor Road, owned by a private company; (c) lines connecting Prahran, Windsor, St. Kilda and Elsternwick with Glen Huntly, Caulfield, Malvern, Glenferrie and Kew, controlled by the Prahran and Malvern Tramways Trust; (d) lines from Elgin Street, Melbourne, to Bell Street, Coburg, and Moreland Road to Baker's Road, Fawkner, owned by the Melbourne, Brunswick and Coburg Tramways Trust, and (e) Princes Bridge to Boundary Road, Burwood, and Wallen Road, Hawthorn, to Bridge Road, Richmond, owned by the Hawthorn Tramways Trust. There is also a cable tramway, two and a-quarter miles in length, between Clifton Hill and Preston, owned by the Northcote municipality. There is a short steam tramway, about one mile long, at Sorrento, and there are also systems of electric tramways at Ballarat, Bendigo, and Geelong, constructed and run by private companies. A number of tramways has been constructed for special purposes in various parts of the State under the provisions of the Tramway Act 1890. These tramways correspond to the description of private railways referred to in paragraph 1 hereof. An electric tramway between Sandringham and Black Rock, 2.38 miles in length, is under construction by the Railway Department. A tramway to the Zoological Gardens, with horse traction, is operated by the Melbourne Tramway Trust.

(i.) *Melbourne Cable Tramways.* A short account of the formation of the Melbourne Tramway and Omnibus Company, and of the Tramway Trust, will be found in previous issues of this book. (See Year Books No. 7, page 652, and No. 9, page 679.) The company was required by the original Act, as amended in 1892, to complete the tramways by the end of the year 1893, and in return a thirty-two years' lease of the tramways was granted to it, dating from the 1st July, 1884—when the liability for interest on the loans commenced—and expiring on the 1st July, 1916. The total amount the Trust was empowered to borrow was £1,650,000, which was raised in London by means of debentures bearing interest at $4\frac{1}{2}$ per cent. The premiums received amounted to £55,794, making a total of £1,705,794. This amount had been expended by the end of the year 1893, when further loan expenditure ceased. The first line—that to Richmond—was opened to traffic in November, 1885, and the work being rapidly pushed on, the other lines 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. The gauge of track is 4 feet $8\frac{1}{2}$ inches.

(a) *Particulars of Working.* The subjoined statement shows the tram mileage, the number of passengers carried, and the revenue and expenditure for the years 1901-2 and 1912 to 1916:—

**MELBOURNE CABLE TRAMWAYS.—PARTICULARS OF WORKING,
1901-2 and 1912 to 1916.**

Year ended the 30th June.	Tram Mileage.	Number of Passengers Carried.	Revenue.	Working Expenses.	Percentage of Working Expenses to Revenue.
	No.	No.	£	£	%
1902	9,226,883	47,261,572	474,835	269,554	56.7
1912	11,313,212	84,926,712	760,792	343,919	45.2
1913	11,839,473	89,359,248	795,091	386,603	48.6
1914	12,056,510	91,438,777	823,567	400,202	48.5
1915	11,887,462	87,707,934	736,154	404,056	54.9
1916	11,977,916	96,702,943	805,636	411,426	51.1

On the 30th December, 1915, the Victorian Government appointed a Tramway Board of five members to take over the tramways as from 1st July, 1916, and in due course the Board entered into possession of the tramway properties. The amount of compensation to be paid to the company has been the subject of arbitration, but has not yet been settled owing to an appeal as to the amount awarded, which is still under consideration.

(ii.) *Electric Tramways.* As already mentioned, there are in Melbourne five electric tramway systems, namely (a) the St. Kilda-Brighton line, (b) the North Melbourne tramways, (c) the Prahran-Malvern Tramway Trust system, (d) the Melbourne, Brunswick and Coburg Tramway Trust system, and (e) the Hawthorn Tramway Trust system.

(a) *The St. Kilda-Brighton Line.* Under the St. Kilda and Brighton Electric Street Railway 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. The capital cost to the 30th June, 1916, exclusive of rolling-stock, was £96,141, and of rolling-stock £36,159, making a total of £132,300. 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, 1911 to 1916:—

ST. KILDA-BRIGHTON ELECTRIC STREET TRAMWAY, 1911-1916.

Year ended 30th June.	Mileage Open (Route).	Capital Cost.	Car Mileage.	Passengers Carried.	Gross Revenue.	Working Expenses.	Interest.	Net Profit or Loss.
1911	5.13	£ 59,007	346,849	1,410,907	12,852	9,819	2,107	+ 926
1912	5.13	60,590	367,306	1,674,918	15,012	13,283	2,078	— 349
1913	5.13	88,133	413,939	1,916,618	16,829	15,808	3,093	—2,072
1914	5.16	95,494	541,449	2,390,949	20,516	20,850	3,333	—3,667
1915	5.16	101,726	577,468	2,718,972	22,614	19,905	3,428	— 719
1916	5.16	132,300	597,819	3,126,984	25,580	22,844	4,697	—1,961

1. Profit is indicated by +, loss by —.

The average fare paid per passenger was 1.95 pence in 1915-16 as against 1.99 pence in 1914-15. The gross revenue in 1915-16 was 10.27 pence per passenger car mile and £2640 per mile of single track open.

(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 and track mileage for year ended 30th September, 1916, were 7.51 and 11.43 miles respectively, the gauge of line being 4 feet 8½ inches. The number of passengers carried during the same period was 3,782,430. The current used during the year for traction purposes was 865,637 kilowatt hours, while the number of persons employed was 123.

(c) *The Prahran-Malvern Tramway.* The lines have been constructed under the control of a trust, which now consists of seven members appointed from the councils of Prahran, Malvern, St. Kilda, Caulfield, Hawthorn, Kew, and Camberwell. At the 30th September, 1916, the total route mileage open was 32.06 miles, the total track mileage being 59.43 miles, and the total capital cost £734,020. 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, 1916, the current used for traction purposes was 5,597,580 kilowatt hours, and the number of tram miles run was 2,590,692, the number of passengers carried 23,095,442, the gross revenue £151,121, and the working expenses £105,926. The number of cars in use was 79, and the number of persons employed 458.

(d) *The Melbourne, Brunswick and Coburg Tramways Trust.* The first section of these tramways, that from between Moreland Road and Bell Street, was opened for traffic on 27th April, 1916. At the 30th September, 1916, the route and track mileages open for traffic were 4.14 and 7.39 miles respectively. For the five months the trams were in operation the current used for traction purposes was 113,820 kilowatt hours, the tram miles run 70,219, the number of passengers carried 718,958, the gross revenue £3516, and the working expenses £3091. Twelve cars were in use, and the number of persons employed was 47.

(e) *The Hawthorn Tramway Trust.* The first section of these tramways, that from Princes Bridge to Power Street, Hawthorn, was opened for traffic on 6th April, 1916, and on 30th September, 1916, the route and track mileages in operation were 8.89 and 15.72 miles respectively. In the six months the trams were in operation the current used for traction purposes was 662,590 kilowatt hours, the tram miles run 335,343, number of passengers carried 3,125,946, the gross revenue £22,095, and the working expenses £12,354. The number of cars in use was 24 and the number of persons employed 127.

(f) *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 21.25 route miles and 25.86 track miles respectively, the gauge being 4 ft. 8½ in. During 1914-15, 4,841,667 passengers were carried, the gross revenue being £44,121, and the working expenses £33,814. The number of cars in use was 55, and the number of persons employed was 137.

(g) *The Geelong Electric Tramways.* This line, which is privately owned, was opened for traffic in January, 1912, and up to the 31st August, 1916, the cost of construction and equipment, exclusive of generating plant, was £59,643. The system has a length of 6 miles of single track, the gauge being 4 ft. 8½ in. The car mileage for the year ending on that date was 235,198 miles, and the number of passengers carried 1,196,778. For the same period the revenue was £13,492, and the expenditure £9874.

(h) *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 1911 to 1916 inclusive:—

VICTORIA.—PARTICULARS OF WORKING OF ELECTRIC TRAMWAYS, 1911-16.

Year.	Mileage Open for Traffic (Route).	Total Cost of Construction and Equipment.	Current Generated at Central Stations for Traction Purposes.	Tram Miles Run.	Number of Passengers Carried.	Gross Revenue.	Working Expenses.	Number of Cars in Use.	Number of Employees.
	Miles.	£	Kilowatt-hrs.	No.	No.	£	£	No.	No.
1911	39.30	1 407,576	3,009,375	2,353,896	12,360,516	1 86,983	1 60,362	117	413
1912	43.70	1 498,439	3,495,527	2,772,524	16,062,696	1 109,568	1 77,732	134	501
1913	54.12	1 778,940	4,551,022	3,182,916	20,181,350	1 139,809	1 102,629	169	593
1914	62.95	1 847,018	6,591,628	4,110,787	28,071,661	1 190,842	1 142,825	181	735
1915	70.57	1 1,061,288	7,445,978	4,358,030	30,150,912	1 200,107	1 149,469	193	811
1916	85.01	1 1,525,372	9,568,051	5,367,643	39,888,205	1 259,925	1 187,903	235	1,018

1. Exclusive of North Melbourne Tramway.

(iii.) *Private Tramways for Special Purposes.* There is in Victoria a number of tramways, or more strictly light private railways, 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 40.45 route miles at the end of the year 1916, and there is a steam tramway in operation at Rockhampton having a length of 6 route miles. Particulars of Shire tramways have been given in the part of this section dealing with private railways (see p. 668).

(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 1915 was £1,476,866, the gauge of line being 4 ft. 8½ in. The following table gives particulars of these tramways for the calendar years 1901 and 1911-16.

QUEENSLAND.—BRISBANE ELECTRIC TRAMWAYS, PARTICULARS OF WORKING, 1901 and 1911-16.

Year.	Mileage Open for Traffic (Route).	Cost of Construction and Equipment.	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	25.00	1 ...	3,192,955	2,756,443	16,183,801	111,483	64,710	79	375
1911	34.32	1,211,037	1 ...	3,671,963	36,443,222	253,971	129,285	124	736
1912	34.32	1,235,710	5,798,622	3,508,410	36,375,652	254,838	162,305	129	762
1913	34.55	1,238,518	7,013,962	3,979,443	44,690,950	316,244	191,936	149	803
1914	38.20	1,437,550	10,002,034	4,111,908	48,162,065	348,406	194,960	154	825
1915	40.20	1,476,866	11,563,696	4,339,863	49,695,313	372,383	233,761	161	803
1916	40.45	1 ...	12,213,674	4,286,802	51,029,668	364,745	216,607	172	921

1. Not available.

(ii.) *Rockhampton Municipal Tramways.* These tramways were opened for traffic in 1909, the motive power being steam. The length of track is 6 route miles, and the gauge 3 ft. 6 in. The capital cost to 31st December, 1916, was £45,678. During the year 1,369,453 passengers were carried, the revenue being £10,956, and working expenses £10,772.

(iii.) *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, 1916, a length of 54.42 route miles had been electrified and opened for traffic, the corresponding length of track opened being 88.88 miles. The cost of construction and equipment on the 31st July, 1916, was £1,486,546. The following table gives particulars of the tramways for the years ended 31st July, 1911-16:—

SOUTH AUSTRALIA.—ADELAIDE ELECTRIC TRAMWAYS.—PARTICULARS OF WORKING, 1911-16.

Year.	Mileage Open for Traffic (Route)	Capital Cost.	Current Used for Traction.	Car 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.	£
1911	39.26	1,131,786	5,986,791	3,620,222	31,345,576	225,498	160,922	130	975			
1912	48.48	1,299,234	7,687,317	4,657,994	37,846,808	279,193	181,020	158	1,057			
1913	49.69	1,350,710	9,169,269	5,140,706	41,576,483	310,241	207,319	170	1,113			
1914	51.86	1,396,638	9,838,252	5,325,660	43,797,227	328,810	202,503	170	1,073			
1915	54.42	1,451,989	9,428,315	4,914,357	42,287,503	309,915	191,070	170	1,045			
1916	54.42	1,486,546	9,286,910	4,719,043	43,141,885	322,759	193,965	170	1,120			

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 seven and one-half miles of private tramways used for passenger service. The subjoined statement gives various particulars of these lines:—

SOUTH AUSTRALIA.—PARTICULARS OF HORSE TRAMWAYS, 1915-16.

Particulars.	Length.	Gauge.	Nature of Traffic.
GOVERNMENT TRAMWAYS.			
Moonta, Moonta Bay, and Hamley Flat	15.15	5 3	Passengers and goods.
Gawler	1.20	5 3	" "
Victor Harbour and Breakwater	1.00	5 3	" "
Dry Creek and Magazine	1.00	2 0	Explosives.
Magazine and Broad Creek	1.50	2 0	" "
Port Broughton and Mundoorra	10.01	3 6	Passengers and goods.
PRIVATE TRAMWAYS.			
Port Adelaide and Alberton ¹	3.50	5 3	Passengers.
Glenelg and Brighton ²	4.00	4 8½	" "

1. Included in mileage of Government Railways. 2. Now owned by Municipal Tramway Trust. 3. Not in operation at present.

6. **Western Australia.**—In this State there are a number of horse tramways, amounting in all to a length of 24 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 13 miles. The remaining 11 miles belonging to the Government are made up of four short lengths, varying from two and a quarter miles to three miles long, worked in connection with the jetties at certain ports for the purpose of providing the necessary communication between such jetties and the goods sheds or warehouses. Most of these 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, Kalgoorlie and Boulder City, 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, 1916, show that the capital cost of the line to that date was £60,101, the gross revenue for the year being £2376, and the working expenses £1847.

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

(a) *The Perth Electric Tramways* were opened for traffic by a private company in 1899, and the system has since been extended to many of the outlying suburbs. This tramway system was taken over by the Government on 1st July, 1913, and is now running in conjunction with the Government railways. On the 30th June, 1916, the route and track miles open for traffic were 27.34 and 36.55 miles respectively, the total cost of construction and equipment to that date being £562,541. During the year, 11,243,138 passengers were carried, the gross revenue being £118,934 and the working expenses £84,780. Sixty-three motors were in use, and the number of employees was 372. The gauge of line is 3 ft. 6 in.

(b) *The Fremantle Tramways* were opened in November, 1905, under the control of the municipality. On the 31st August, 1916, there were 8.64 route or 11.55 track miles of line open for traffic, the cost of construction and equipment at that date being £111,790. This line has a gauge of 3 ft. 6 in. During the year 4,866,730 passengers were carried, the gross revenue being £38,079 and the working expenses £29,052. Twenty-five cars were in use, and the number of employees was 125.

(c) *The Kalgoorlie and Boulder City Tramways* are 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 1915 the total mileage of the whole system—in Kalgoorlie and Boulder City—amounted to 14½ route or 20½ track miles, the total cost of construction and equipment being £451,988. During the year, 2,192,135 passengers were carried, the gross revenue being £33,420 and the working expenses £24,546. Twenty-five motors and seven trailers were in use, and the number of employees was 69. The gauge of this line is 3 ft. 6 in.

(d) *The Leonora-Gwalia Tramway*, two and a quarter route miles in length, formerly a steam tramway, was opened for traffic by electrification on 5th October, 1908. This tramway is under municipal control, and has a gauge of 3 ft. 6 in. The cost of construction is approximately £5800, and during the year ended 31st October, 1916, 53,166 passengers were carried. Revenue for the year amounted to £692 and expenditure to £1255. Owing to a fire at the power house, traffic was interrupted during part of the year. Three cars were in use, and the number of employees was six.

(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 1911-16.

**WESTERN AUSTRALIA.—PARTICULARS OF ELECTRIC TRAMWAYS,
1901 and 1911-16.**

Year.	Mileage Open for Traffic (Route).	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	16½	367,037	...	721,056	...	46,270	26,673	30	...
1911	47.89	1,031,374	4,028,102	2,337,860	13,889,777	154,470	92,779	101	377
1912	48.02	1,045,945	4,503,003	2,508,857	16,578,461	169,647	98,843	107	409
1913	48.02	1,042,584	4,728,809	2,602,321	16,480,895	174,803	103,387	109	425
1914	48.83	1,068,058	5,424,038	2,716,707	17,331,979	184,072	126,586	121	453
1915	50.75	1,092,289	5,045,163	2,793,519	17,568,161	182,935	130,868	121	471
1916	52.98	1,132,119	5,203,548	2,874,308	18,355,169	191,125	139,633	123	572

1. For the year 1901 the figures represent miles of single track. 2. Not available. 3. Exclusive of Leonora Tramway with the exception of the mileage open for traffic. 4. Exclusive of Perth Tramways. 5. Exclusive of Leonora Tramway.

(iii.) *Perth Ferries.* As the Perth ferry services are mainly subsidiary to the suburban railway and tramway systems, they are referred to in this section rather than under *Shipping*. Of the twelve boats in service, four are under the control of the Western Australian Government, the other eight belonging to a private company. The number of passengers carried during the year 1915-6 was 1,051,290, the revenue and expenditure for the same period were £9738 and £9293 respectively, and the number of persons employed 39.

7. *Tasmania.*—(i.) *Tramways.* In Hobart there is a system of electric tramways, opened for traffic in 1893, amounting in all to a length of 13 route and 15½ track miles. This was originally owned by a private company, but is now the property of the Hobart Municipal Council. 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 and track mileage of 8.95 and 11.34 miles respectively. The gauge of track in both these systems is 3 ft. 6 in.

The following table gives particulars of the working of the two systems for the years 1901 and 1911-16 :—

**TASMANIA.—PARTICULARS OF WORKING OF ELECTRIC TRAMWAYS,
1901 and 1911-16.**

Year.	Mileage Open for Traffic (Route).	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 ¹	9.00	90,000	...	321,633	1,734,120	16,097	11,735	20	90
1911 ³	14.77	144,283	845,403	434,295	3,363,500	32,780	19,310	42	152
1912	14.77	147,538	1,427,818	759,103	5,807,892	51,164	31,167	42	188
1913	16.71	280,871	1,555,053	836,508	6,344,566	55,875	37,058	47	235
1914	18.91	325,239	1,345,918	908,862	7,147,543	60,885	38,946	49	259
1915	21.43	347,214	2,171,968	999,315	7,462,782	68,170	46,568	60	314
1916	21.95	355,412	2,246,218	1,028,017	7,670,434	70,474	48,412	60	269

1. Hobart Tramways only. 2. Not available. 3. Exclusive of Launceston Tramways with the exception of mileage, cost of construction number of cars, and of persons employed.

There is also a tramway from Smithton to Marawah, 27½ miles in length, operated by the Government. Of this distance eight miles are worked as a horse tram, the rest being for steam traction. In the year 1915, 366 passengers and 20,309 tons of goods were conveyed, the number of employees being 11.

A private tram at Zeehan, 2½ miles in length, is also in operation. In 1915, 1138 passengers and 7929 tons of goods were conveyed, the number of persons employed being four.

(ii.) *Ferries.* The Hobart ferry service, being of a suburban character, is referred to here rather than under *Shipping*. There is one company controlling a fleet of six boats, and also a ferry operated by the Public Works Department with two boats. In the year 1915-16 the number of passengers carried was 601,483, the revenue £11,152, the working expenses £10,680, and the number of persons employed 39.

8. **Electrical Traction in Commonwealth, 1915-16.**—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 Kalgoorlie tramways in Western Australia, and for the Brisbane tramways, are for the calendar year 1915; and for other tramways the returns are, generally, for the financial year 1915-16:—

ELECTRIC TRAMWAYS IN COMMONWEALTH, 1915-16.

State.	Mileage open for Traffic (Route)	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.	No.	No.	£	£	No.	No.
N.S.W.	151.05	7,526,701	81,688,434	25,008,055	372,048,293	1,838,708	1,452,470	1,402	9,308
Victoria	85.01	1,525,372	9,568,051	5,367,643	39,888,205	1,259,925	1,187,903	235	1,018
Queensland	40.45	1,476,866	12,313,674	4,286,802	51,029,668	364,745	216,607	172	921
South Australia ...	54.42	1,486,546	9,286,910	4,719,043	43,141,885	322,759	193,665	170	1,120
West. Australia ...	52.98	1,132,119	5,203,548	2,874,308	18,355,169	191,125	139,633	123	572
Tasmania	21.95	355,412	2,246,218	1,028,017	7,670,434	70,474	48,412	60	269
Commonwealth	405.86	13,503,016	120,206,835	43,283,868	432,133,654	3,047,736	2,238,990	2,162	13,208

1. Exclusive of North Melbourne Tramway. 2. Incomplete. 3. Exclusive of Leonora Tramway.

In the following table particulars are shewn as to the operations of electric tramways in the Commonwealth for the period 1907-1916:—

ELECTRIC TRAMWAYS IN COMMONWEALTH, 1907-1916.

Year.	Mileage open for Traffic (Route).	Total Cost of Construct'n & Equip'm't.	Current Generated.	Tram Miles Run.	Number of Passengers Carried.	Gross Revenue.	Working Expenses.	No. of Cars, Motors, & Trailers	No. of Employees
	Miles.	£	Kilowatt-hours.	No.	No.	£	£	No.	No.
1906-7	203.43	5,497,003	40,636,237 ³	23,683,970	191,598,262	1,315,659	894,710	1,041	5,443
1907-8	208.74	5,844,308	48,606,307	24,539,014	210,332,185	1,328,183	977,439	1,060	6,102
1908-9	225.55	6,353,668	54,397,617 ⁴	25,913,152	227,412,566	1,428,448	1,037,615	1,310	6,920
1909-10	272.06	7,731,802	62,178,314 ⁴	30,467,336	268,221,754	1,717,710	1,296,193	1,401	8,372
1910-11	297.47	7,969,245	75,094,750 ⁴	33,625,344	312,857,166	1,917,286	1,411,866	1,506	9,329
1911-12 ²	322.24	9,443,587	93,897,694	37,256,203	363,959,404	2,327,537	1,763,021	1,628	11,063
1912-13	345.79	10,917,086	106,967,982	41,258,696	355,796,475 ⁵	2,616,381	2,078,770	1,854	11,723
1913-14	365.49	12,129,336	118,894,845 ⁴	44,147,626	435,058,028	2,894,078	2,226,005	2,071	12,548
1914-15	387.40	12,779,512	117,246,344 ⁴	42,811,891	416,798,309	2,967,532	2,220,982	2,135	12,077
1915-16	405.86	13,503,016	120,206,835 ⁴	43,283,868	432,133,654	3,047,736	2,238,990	2,162	13,208

1. Exclusive of North Melbourne Tramway. 2. Exclusive of Leonora Tramway (W.A.), with exception of mileage. 3. Exclusive of Brisbane Tramways. 4. Exclusive of Leonora Tramway. 5. Exclusive of Perth Tramways (W.A.).