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.

In the publication "Local Government in Australia," issued by the Commonwealth Statistician in 1919, the subject of roads is also fully discussed.

2. **Expenditure on Roads and Bridges.**—Figures shewing the total expenditure on roads and bridges in the States are not available. The subjoined statement, however, gives the amounts of total loan expenditures by the State Governments up to the 30th June, 1920 :—

ROADS AND BRIDGES.—TOTAL GOVERNMENT LOAN EXPENDITURE TO THE 30th JUNE, 1920.

State.	N.S.W.*a*	Victoria.	Q'land.*b*	S. Aust.	W. Aust.	Tasmania.	All States.
	£	£	£	£	£	£	£
Expenditure ..	1,841,220	2,566,032	931,775	1,809,743	380,431	3,575,775	11,104,976

(*a*) Including punts. (*b*) Including amounts from surplus revenue on which no interest is payable.

The following table shews the annual expenditure from loans on roads and bridges by the central Governments in each State during the years 1915–16 to 1919–20 :—

ROADS AND BRIDGES.—LOAN EXPENDITURE BY STATE GOVERNMENTS, 1916 TO 1920.

Year.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	All States.
	£	£	£	£	£	£	£
1915–16 ..	421	495,062	..	102,226	18,450	..	616,159*a*
1916–17 ..	5,428	252,836	..	54,939	5,878	..	319,081*a*
1917–18 ..	22,374	241,892	..	43,693	2,601	..	310,560*a*
1918–19 ..	13,089	360,524	..	22,008	4,310	90,101	490,032
1919–20 ..	6,674	623,570	..	66,393	14,720	81,940	793,297

(*a*) Exclusive of Tasmania.

The two tables given above shew only a small proportion of the actual expenditure upon roads and bridges in the different States, for the reason that (*a*) there have been large expenditures from revenue, both by the central Governments and by local authorities, and (*b*) the State Governments have in many cases voted grants and subsidies on the amount of rates collected, and have issued loans to local authorities either for the express purpose of the construction of roads and bridges or for the general purpose of public works construction. Returns of expenditure, where available, are given below for each

State. Although no revenue is now derived directly from roads and bridges, they are indirectly of great value to the community, forming, next to railways and public lands, the most considerable item of national property.

3. New South Wales.—The information contained in the following paragraphs and tables is the latest available as the details are collected triennially in this State, the year 1918 being the latest year of collection. The control of all roads, bridges, and ferries in New South Wales is now regulated by the Local Government Act No. 41, 1919, which came into force on the 1st January, 1920. 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 local governing bodies concerned. 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, 1918, 58 miles of roads, 282 bridges, 55 wharves, 99 jetties, and 17 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.; and 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*, 543 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 58 miles proclaimed as "National" works) in 1918 was approximately 99,481 miles, of which 10,214 miles were controlled by municipalities, 83,309 by shires, and 5,958 miles were in the unincorporated areas of the Western Division. The following table gives particulars for the year 1918 of roads classified according to whether metalled, etc., formed only, cleared only, or natural surface:—

NEW SOUTH WALES.—APPROXIMATE LENGTH OF ROADS, 1918.

Classification.	Metalled, Ballasted, Gravelled, etc.	Formed only.	Cleared only.	Natural surface.	Total.
	Miles.	Miles.	Miles.	Miles.	Miles.
Metropolitan	1,428	417	168	171	2,184
Country municipalities	2,834	1,514	1,952	1,730	8,030
Shires	15,427	11,949	25,522	30,411	83,309
Western Division (unincorporated) ..	176	117	2,999	2,666	5,958
Total	19,865	13,997	30,641	34,978	99,481

(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 1918, are given in the following table :—

NEW SOUTH WALES.—BRIDGES, CULVERTS, AND FERRIES, 1918.

Particulars.	Bridges.		Culverts.		Ferries.
	No.	Length.	No.	Length.	No.
		Feet.		Feet.	
"National" works	282	108,034	..	..	17
Metropolitan	86	5,549	818	40,939	1
Country municipalities	643	34,212	3,549	90,532	11
Shires	3,567	219,643	34,557	314,079	98
Western Division (unincorporated) ..	97	13,166	209	2,035	..
Total	4,675	380,604	39,133	447,585	127

(iv) *Expenditure on Roads and Bridges.* Since the year 1857 the total expenditure by the Roads Department and Road Trusts on roads and bridges is £25,449,714. 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, 1914, and for each succeeding financial year up to 1919, 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 1919.

Period.	Expenditure by Roads Department.	Expenditure by Trustees.	Total.
	£	£	£
1857 to 30th June, 1914 ..	23,765,192	1,288,691	25,053,883
1914–15	92,729	..	92,729
1915–16	65,928	..	65,928
1916–17	74,124	..	74,124
1917–18	74,459	..	74,459
1918–19	88,591	..	88,591
Total	24,161,023	1,288,691	25,449,714

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, which 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.

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

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

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

For the construction of developmental or feeder roads to the main road system the Developmental Roads Act (No. 2944) was passed in 1918. Under the authority of this Act the Country Roads Board is empowered to spend a sum of £500,000 over a period of five years on some of the more important roads in the less developed and neglected parts of the State. This sum was subsequently increased to £2,000,000 (Act No. 2985). The amount expended during the year 1918–19 under this Act was £47,562.

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 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, 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 (which has been incorporated in the Local Government Act 1915), are to be credited to the Country Roads Board Fund

Up to the 30th June, 1918, there were 6,500 miles of declared main roads, agreed to by the councils, and gazetted. The total amount expended during 1918–19 for permanent works was £284,734, and for maintenance work £179,133, a total of £463,867. The net receipts for the year were £261,655, of which amount the chief items were motor registration and license fees, £67,666, unused roads and water frontages license fees, £22,374, contributions by municipalities for permanent works, £29,841; ditto for maintenance works, £82,453; and appropriation for maintenance under the Main Roads Act No. 2986, £50,000.

(ii) *General and Local Government Expenditure.* The gross amount expended directly by the State Government of Victoria on roads and bridges up to the end of June, 1919 was £8,806,565. 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 the amounts of municipal loan expenditure in 1901 and from 1916 to 1920 :—

VICTORIA.—EXPENDITURE ON ROADS AND BRIDGES, 1901 AND 1916 TO 1920.

Financial Year.(a)	Expenditure by State Government.	Municipal Loan Expenditure.		Formation of Private Roads, Streets, Lanes, etc.(b)	
		Cities, Towns, and Boroughs.	Shires.	Cities, Towns, and Boroughs.	Shires.
	£	£	£	£	£
1901	72,890	16,844	12,928	18,829	4,521
1916	25,651	92,198	44,945	64,481	3,543
1917	16,514	41,686	7,279	60,277	3,222
1918	19,782	22,037	19,007	72,506	2,968
1919	20,591	31,864	13,194	103,493	7,632
1920	7,832	(c)	(c)	(c)	(c)

(a) 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.
(b) Including the cost of flagging, asphalting footpaths, etc., but exclusive of loan expenditure.
(c) Not available.

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*) cities, (*b*) towns, and (*c*) 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 and subsequent amendments. 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 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 Section XXVI., *Local Government*, hereinafter. Under the Main Roads Act of 1920, a main roads board is appointed to take over main roads and construct new ones. The cost is defrayed from moneys appropriated by Parliament, taxes on motor vehicles and traction engines, wheel tax, fees for unused roads, etc. Half the amount expended is to be recovered from local authorities within 30 years with interest.

6. **South Australia.**—Figures are not available in this State for a later date than 1919. Of the several Australian States, South Australia has by far the largest unincorporated area, no less than 88 per cent. of the whole area of the State being in this condition. This area is, however, very sparsely populated and much of it is entirely unoccupied. The remainder of the State is for purposes of local government under the control of municipal corporations and district councils. Under the provisions of the District Councils Acts 1914, 1917, and 1918, the Municipal Corporations Acts 1890 to 1918, 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 Roads Amendment Act 1915, a number of roads were declared to be main roads. The Main Roads Fund Act 1920 provides for the raising of £150,000 for the purpose of reconstructing main roads and bridges, and acquiring and working quarries.

The total estimated length of streets and roads in the incorporated area in South Australia up to the 30th June, 1919, was as follows :—

SOUTH AUSTRALIA.—ESTIMATED LENGTH OF ROADS AND STREETS IN THE INCORPORATED AREA, 1919.

Particulars.	Woodblocked.	Macadamised.	Other.	Total.
Miles	10	10,529	32,855	43,394

(ii) *Expenditure by Corporations on Main and District Roads.* The following table shews the expenditure by municipal corporations on both main and district roads for each year from 1915 to 1919 inclusive :—

SOUTH AUSTRALIA.—EXPENDITURE BY CORPORATIONS ON STREETS, ROADS AND BRIDGES, 1915 TO 1919.

Year ended 30th November—	District Roads.		Main Roads Fund.			
	Expenditure.		Receipts.		Expenditure.	
	Construction.	Maintenance.	From Main Road Grants.	Total.	Construction.	Maintenance.
	£	£	£	£	£	£
1915	31,732	74,887	12,084	12,820	26	11,502
1916	25,483	73,118	9,669	12,098	88	13,679
1917	15,952	80,106	14,299	15,787	619	13,073
1918	13,983	89,657	10,490	13,033	1,990	12,524
1919	14,535	99,567	12,466	14,734	..	15,263

(iii) *Expenditure by 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, 1915 TO 1919.

Year ended 30th June—	District Roads.		Main Roads Fund.			
	Expenditure.		Receipts.		Expenditure.	
	Construction.	Maintenance.	From Main Road Grants.	Total.	Construction.	Maintenance.
	£	£	£	£	£	£
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
1917	47,337	79,377	109,044	111,567	18,809	72,644
1918	62,280	103,219	126,682	126,865	41,319	103,312
1919	67,194	108,862	120,635	120,790	28,481	97,991

7. **Western Australia.**—In Western Australia the construction, maintenance, and management of roads and bridges throughout the State are under the control of municipalities constituted by the Municipal Corporations Acts 1906–1919, and district road boards constituted by the Road Districts Act 1919.

(i) *District Roads and Bridges.* Under the provisions of the Road Districts 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 thirteen members elected by the ratepayers. The board is invested with full powers for controlling and managing all roads and bridges within the district. A district road board may not, however, construct any road or street less than sixty-six feet wide 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 Road Districts Act.

(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 Acts 1906–19. 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 Boards for the years 1916 to 1920 :—

WESTERN AUSTRALIA.—PARTICULARS OF ROADS UNDER CONTROL OF DISTRICT ROAD BOARDS, 1916 TO 1920.

Year ended 30th June.	Road Districts.	Revenue.				Expenditure.	Length of Cleared Roads.(*d*)				No. of Bridges and Culverts.	
		From Rates.	From Grants and Subsidies.	From other Sources.	Total.		Cleared only.	Cleared and Formed.	Metalled or otherwise Constructed.	Total.	Bridges.	Culverts.
	No.	£	£	£	£	£	Miles.	Miles.	Miles.	Miles.	No.	No.
1916	113	104,345	24,397	38,820	167,562	166,340	19,258	4,503	5,076	28,837*a*	760	6,907
1917	117	113,686	30,226	55,383	199,295	189,177	19,903	5,680	4,359	29,942*b*	839*b*	7,433*b*
1918	116	116,245	32,594	46,187	195,026	206,165	20,691	5,937	4,390	31,018*a*	906*a*	7,817*a*
1919	118	118,144	27,692	53,748	199,584	204,112	22,455	6,645	4,569	33,669*b*	937*b*	8,062*b*
1920	119	135,644	53,234	68,902	257,780	243,365	22,936	6,926	4,770	34,632*c*	960*c*	8,355

(*a*) Exclusive of two Boards which have not supplied the information. (*b*) Exclusive of three Boards. (*c*) Exclusive of one Board. (*d*) Approximate only.

The following table gives similar information with reference to roads controlled by municipalities under the Municipal Corporations Acts 1906–19 :—

WESTERN AUSTRALIA.—PARTICULARS OF STREETS, ROADS, AND BRIDGES UNDER THE CONTROL OF MUNICIPALITIES, 1916 TO 1920.

Year ended the 31st October.	No. of Municipalities.	Length of Streets and Roads.(a)					Revenue.		Expenditure.	
		Paved, Metalled, or Gravelled.	Formed only.	Cleared only.	Not Cleared.	Total.	From Rates.	From Grants.	Works and Improvements.	Street Lighting and Watering.
		Miles.	Miles.	Miles.	Miles.	Miles.	£	£	£	£
1916 ..	30	559	88	253	238	1,138	166,617	9,462	120,411	24,952
1917 ..	28	562	94	244	238	1,138	167.997	7,813	73,991	23,481
1918 ..	25	562	103	231	224	1,120	171,315	1,870	75,086	25,580
1919 ..	23	570	109	220	219	1,118	177,408	3,595	71,907	24,036
1920 ..	23	560	93	254	227	1,134	190,171	1,142	95,194	25,283

(a) Approximate only.

8. **Tasmania.**—(i) *Construction.* In Tasmania the cost of construction of roads, tracks, and bridges (and in earlier days of streets) has been borne almost entirely by the central Government.

Up to the 30th June, 1920, the loan expenditure on these works has been £3,575,775. In addition, half the proceeds of the sale of land has formed a Crown Lands Fund for the construction of roads to new holdings. Under this provision £645,674 has been expended. This fund has in recent years more than met the demands on it, and expenditure therefrom since 1918 has been limited to £10,000 annually, the balance being used for redemption of debt.

ROADS, STREETS, TRACKS, AND BRIDGES—EXPENDITURE ON CONSTRUCTION.

Period.	Expenditure.		New-road Mileage.		New Bridges.
	Loans.	Crown Lands Fund.	Cleared.	Metalled.	
	£	£	Miles.	Miles.	No.
Total up to 31st December, 1902 ..	1,932,919	332,845	..	..	..
Yearly average—					
1903–7	30,611	26,845	103	26	11
1907–11	92,416	21,946	205	105	13
1911–15	160,730	18,233	234	208	50
1915–19	105,097	6,186	94	113	49
Year 1919–20	81,940	6,563	67	68	17
Total to 30th June, 1920	3,575,775	645,674	..	..	..

The total length of roads at the end of 1920 may be taken as approximately 12,000 miles, of which about half is metalled or gravelled.

(ii) *Maintenance.* The maintenance of roads and bridges is undertaken by the municipalities with some assistance from the central Government, chiefly by way of subsidy. Under the Aid to Road Rates Act, £11,000 are distributed annually among the municipalities, in proportion as the cost of maintenance falls on their resources. Under the Main Roads Maintenance Act 1918 a further sum of £5,000 was provided out of Consolidated Revenue, which, with the addition of the Motor Tax, less 5 per cent., and a contribution from municipalities, is expended on the upkeep of main roads. In 1920 the amount available for 1,011 miles of main road was £21,545. The work is carried out in most cases by municipalities, under the general direction of an Advisory Board, on which the Government, the municipalities, and the motorists are all represented. Further, the Repairs to Roads Act 1920 provides for loans for 15 years to municipalities for the purpose of re-making roads—half the loan is repaid in instalments by the local body and the remainder by the State Government. The Government also provides for the repair of the more important bridges and for emergency work.

The municipal expenditure on roads (excluding Hobart and Launceston streets) is practically supplied by the road rate, which must by law be between sixpence and eighteen pence in the pound of annual value. The average road rate actually collected has slightly increased from 10.7 pence in the pound in 1908 (the first year of the present municipalities) to 11.6 pence in the pound in 1918.

EXPENDITURE ON MAINTENANCE OF ROADS AND BRIDGES IN MUNICIPALITIES (EXCLUDING HOBART AND LAUNCESTON), 1908 TO 1920.

Year.	From Municipal Road Rate.	From State Revenue.
	£	£
1908	42,240	17,339
Average 1909–12	48,759	19,259
Average 1913–17	55,722	20,123
1919	61,316	29,986
1920	(a)	30,006

(a) Not available.

§ 2. Railways.

(A) General.

1. **Introduction.**—In the issues of the Commonwealth Year Book, Nos. 1 to 7, the statistics of all Government railway systems were treated under the head of *Government Railways.* In the following issues, Nos. 8 to 13, 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 part (E) of the present section.

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 of 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 running approximately parallel to the coast. In the east, lines radiating from Cairns, 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 near Serviceton. The South Australian and Victorian railway systems also meet on the border at two other points, one near Pinnaroo, and the other at Rennick near Mount Gambier. By the opening, in 1917, of the Trans-Australian railway from Port Augusta to Kalgoorlie, through communication by rail was established between the eastern States and the Western Australian railway system. The main interstate line, which permits of direct communication between the five capital cities—Brisbane, Sydney, Melbourne, Adelaide, and Perth—covers a distance from end to end of 3,474.65 miles or 3,479.67 miles via Newcastle. The scheduled time for the journey from Brisbane to Perth is five days twenty-two hours forty-five minutes, and from Perth to Brisbane five days twenty hours forty minutes, the time in each case being taken over all.

In the following tables particulars are given of the gauges of lines, changing stations and duration of stops thereat, arrival and departure times, distances and average speeds on the journey from Brisbane to Perth, and vice versa:—

BRISBANE TO PERTH.

Gauge of Line.	Terminal or Changing Stations.	Times. Arr.	Times. Dep.	Day on Journey. (a)	Actual Time.	Duration of Stops at Changing Stations.	Intermediate Distance.	Total Distance from Brisbane.	Average Speed. (b)
ft. in.					h. m.	h. m.	miles.	miles.	m.p.h.
	Brisbane ..	—	8.5 a.m.	Monday..	—	—	—	—	—
3 6	Wallangarra	5.55 p.m.	6.17 p.m.	,,	9 50	0 22	223.46	223.46	22.72
4 8½	Sydney ..	11.25 a.m.	7.25 p.m.	Tuesday	17 8	8 00	c497.38	720.84	29.03
4 8½	Albury ..	7.23 a.m.	7.47 a.m.	Wednesday	11 58	0 24	401.62	1,122.46	33.56
5 3	Melbourne..	12.51 p.m.	4.30 p.m.	,,	5 4	3 39	190.50	1,312.96	37.60
5 3	Adelaide ..	9.55 a.m.	10.45 a.m.	Thursday	17 25	0 50	483.05	1,796.01	27.73
5 3	Terowie ..	3.40 p.m.	4.10 p.m.	,,	4 55	0 30	139.81	1,935.82	28.42
3 6	Port Augusta	10.5 p.m.	10.40 p.m.	,,	5 55	0 35	119.33	2,055.15	20.16
4 8½	Kalgoorlie..	d10.23 a.m.	3.25 p.m.	Saturday	35 43	5 2	1,051.30	3,106.45	29.43
3 6	Perth ..	6.50 a.m.	—	Sunday	15 25	—	373.22	3.479.67	24.20
				Total ..	123 23	19 22	3,479.67	—	28.20

PERTH TO BRISBANE.

Gauge of Line.	Terminal or Changing Stations.	Times. Arr.	Times. Dep.	Day on Journey. (a)	Actual Time.	Duration of Stops at Changing Stations.	Intermediate Distance.	Total Distance from Perth.	Average Speed. (b)
ft. in.					h. m.	h. m.	miles.	miles.	m.p.h.
	Perth ..	—	10.0 p.m.	Monday..	—	—	—	—	—
3 6	Kalgoorlie..	1.30 p.m.	2.15 p.m.	Tuesday	15 30	0 45	373.22	373.22	24.08
4 8½	Port Augusta	5.0 a.m.	8.35 a.m.	Thursday	38 45	3 35	1,051.30	1,424.52	27.13
3 6	Terowie ..	2.46 p.m.	3.16 p.m.	,,	6 11	0 30	119.33	1,543.85	19.30
5 3	Adelaide ..	7.50 p.m.	8.30 p.m.	,,	4 34	0 40	139.81	1,683.66	30.61
5 3	Melbourne	1.3 p.m.	5.0 p.m.	Friday ..	16 33	3 57	483.05	2,166.71	29.19
5 3	Albury ..	10.21 p.m.	10.40 p.m.	,,	5 21	0 19	190.50	2,357.21	35.61
4 8½	Sydney ..	10.45 a.m.	3.30 p.m.	Saturday	12 5	4 45	401.62	2,758.83	33.24
4 8½	Wallangarra	9.7 a.m.	9.30 a.m.	Sunday ..	17 37	0 23	c497.38	3,256.21	28.23
3 6	Brisbane ..	6.40 p.m.	—	,,	9 10	—	223.46	3,479.67	24.37
				Total ..	125 46	14 54	3,479.67	—	27.68

(a) The days here given are for the purposes of time table interpretation. They are not the only days on which the service is provided. (b) Exclusive of stops between changing stations. (c) Runs via Newcastle. (d) 11.53 a.m. on Mondays.

The time allowed for the journey from Port Augusta to Kalgoorlie, 35 hours 43 minutes (actual), gives an average speed of 29.43 miles per hour throughout, inclusive of stoppages. Exclusive of stoppages, which aggregate slightly under three hours, the average speed is about 32.15 miles per hour. In the opposite direction the gross time is 38 hours 45 minutes (actual), which gives an average speed of 27.13 miles per hour. Exclusive of stoppages, which aggregate about 3 hours 10 minutes, the average speed is about 29.55 miles per hour.

The average speed inclusive of all stops on the journey from Brisbane to Perth is 24.38 miles per hour, and from Perth to Brisbane 24.74 miles per hour.

The longest railway journey which can be undertaken in Australia, on one continuous line of railway, is from Longreach in Queensland to Meekatharra in Western Australia, a total distance of 4,760.16 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, while there are also two short lines, one on the north-west, the other on the south coast, which are unconnected with the main system. In the northern parts of Queensland and in the Northern Territory there are also several 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. Standard Times in Australia.—In Year Book No. 12, p. 630, particulars are given in regard to standard times now in use in the Australian States, and an explanation is made as to the mode in which the difference of time between Adelaide and Perth is dealt with on the Trans-Australian Railway. Owing to limits of space it is not possible to repeat this information in the present volume.

5. 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, or by the Commonwealth Government; but, unfortunately for the purpose of interstate traffic, the construction of the various systems in different parts of Australia has proceeded without uniformity of gauge. In 1846 Mr. Gladstone, then Colonial Secretary, recommended in a despatch to the Governor of New South Wales that the 4-ft. 8½-in. gauge should be adopted. In 1850, however, the engineer to the Sydney Railroad and Tramway Company strongly advocated the adoption of the 5-ft. 3-in. gauge, and in 1852 an Act was passed making it compulsory that all railways in New South Wales should be constructed to the wider gauge, the Governors of Victoria and South Australia being duly advised of the step that had been taken. In 1852, however, the company mentioned having changed its engineer, also changed its views as to the gauge question, and in the following year succeeded in obtaining the repeal of the Act of 1852 and in securing the passing of 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 to be 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 5-ft. 3-in. gauge was adopted, but in 1870, 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. The interstate line between Adelaide and Melbourne was opened as a through route in January, 1887, and is of the 5-ft. 3-in. gauge throughout. At the 30th June, 1920, of the 2,333.19 miles of State Government railways in South Australia 1,209.59 miles were of 3-ft. 6-in. gauge, exclusive of 477.96 miles of the same gauge from Port Augusta to Oodnadatta belonging to the Federal Government. In the Northern Territory the line from Darwin to Emungalen (Katherine River), 198.68 miles in length, is of 3-ft. 6-in. gauge. In Western Australia the 3-ft. 6-in. gauge was also adopted. In Tasmania the first line made had a gauge of 5-ft. 3-in., but it was converted in 1887 to 3-ft. 6-in., which, with the exception of three short lines with a 2-ft. gauge, is the present gauge of the Government and most of the privately-owned lines. 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 connexion with the establishment of railway lines, it was decided to adopt the narrow gauge. In Victoria, short lengths of light railways have been constructed to a gauge of 2-ft. 6-in. of an aggregate length of 121.90 miles.

6. Interstate Communication.—Until the railway systems of the eastern States were connected at the common boundaries, the inconvenience of non-conformity of gauge was not felt. Since then, however, the necessary transhipments of both passengers and goods have been a source of increasing trouble, delay, and expense. On the 14th June, 1883, a railway bridge over the River Murray at Wodonga was opened for traffic, and railway 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, 2,900 feet in length, and railway communication was thus established between the four capital cities, Brisbane, Sydney, Melbourne, and Adelaide.

By the opening of the Trans-Australian railway, to which reference has already been made, Western Australia is now linked to the other States, and an unbroken line of communication established from one side of the continent to the other. The construction, moreover, of lines decided upon, and in some cases already made, 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.

7. **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. As already mentioned, 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. 2d. to 2s. 11d. 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 State Government railways, the 4-ft. 8½-in. gauge has a mileage of 4,975.81, all in New South Wales; Victoria and South Australia have a combined mileage of 5,215.70 of 5-ft. 3-in. gauge; while New South Wales, Queensland, South Australia, and Western Australia have together 10,442.17 miles of 3-ft. 6-in. gauge. In addition, the Commonwealth Government has (i) 4.94 miles in the Federal Territory, 597.36 miles in South Australia, and 453.94 miles in Western Australia of 4-ft. 8½-in. gauge, and (ii) 477.96 miles in South Australia, and 198.68 miles in the Northern Territory 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 the 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.

Many conferences on the subject of the unification of gauge have taken place from time to time both between the Railways Commissioners and between the Premiers of the States concerned, and references to these conferences have been made in previous issues of the Year Book (see No. 11, pp. 657–8). A conference between the engineers of the Commonwealth and States railways was held in Melbourne in August, 1918. Much consideration was given to the devices to deal with the break-of-gauge question, which had been submitted to the conference, but all of them failed to meet the requirements of the conditions laid down by the conference in order to ensure both safety and celerity of action in train working.

In June, 1920, a conference took place at Sydney between the Commonwealth and State railway engineers. Four proposals were dealt with, of which the third was considered the most satisfactory compromise for the present conditions of traffic. This proposal favored the conversion of existing lines between the capitals and the construction of such new lines as are advisable to the 4-ft. 8½-in. gauge, the cost of which was estimated at £26,581,000, of which £8,154,000 would be for new line construction.

In July, 1920, a conference took place at Melbourne between the Commonwealth and State representatives of three Governments, and a decision was arrived at under which a committee, consisting of two experts from abroad and an Australian representative not connected with the railways, was to consider the whole question of gauge unification and report to the various Governments concerned as to the best course to be adopted.

On 8th February, 1921, the Governor-General appointed a Royal Commission consisting of two railway engineers—one civil and one mechanical—together with an independent commissioner to inquire into and report on the question of the unification of gauges. The Commission was constituted as follows :—Chairman, Mr. John James Garvan; Civil Engineer, Mr. Rustat Blake; Mechanical Engineer, Mr. Frederick Methven Whyte; with Mr. E. Simms as Secretary. (See also Appendix.)

8. **Rolling Stock Gauges.**—Allied to the question of the gauges of the railways of Australia is that of the rolling stock gauges which are in use, the rolling stock gauge being the maximum transverse dimensions to which the rolling stock may be constructed. In the following table will be found particulars of the rolling stock gauges, together with maximum length and weights of vehicles, at present in use on the Government railways, State and Federal :—

STATE AND FEDERAL GOVERNMENT RAILWAYS.—ROLLING STOCK GAUGES IN USE, 1920.

PASSENGER ROLLING STOCK.

Railway.	Gauge of Track.	Maximum Rolling Stock Gauge.			Maximum Tare.
		Width.	Height above Rail Level.	Length over all.	
	ft. in.	ft. in.	ft. in.	ft. in.	t. c. q.
New South Wales	4 8½	10 6	14 0	74 4½	44 2 1
Victoria	5 3	10 0	14 2	74 1¼	47 16 0
"	2 6	7 0¼	10 4¼	31 8	8 11 0
Queensland	3 6	9 4	12 9	55 5	26 17 0
"	2 0	6 3⅞	10 0	22 0	3 0 0
South Australia	5 3	10 4¼	14 1⅜	74 1¼	40 11 0
"	3 6	9 4⅜	12 1	62 6	24 18 0
Western Australia	3 6	8 10	12 7	61 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—					
Trans-Australian	4 8½	10 6	14 6	78 11½	48 0 0
Northern Territory	3 6	9 4	12 9	39 0	12 0 0
Oodnadatta	3 6	10 2	12 4	39 0	12 0 0

GOODS ROLLING STOCK.

Railway.	Gauge of Track.	Maximum Rolling Stock Gauge.			Maximum—	
		Width.	Height above Rail Level.	Length over all.	Tare.	Carrying Capacity.
	ft. in.	ft. in.	ft. in.	ft. in.	t. c. q.	t. c. q.
New South Wales ..	4 8½	9 8	13 6	60 11	20 10 3	40 0 0
Victoria	5 3	9 7½	13 7¾	55 4½	20 13 1	30 0 0
"	2 6	6 5½	9 7¼	27 3¾	7 12 2½	10 0 0
Queensland	3 6	8 9	12 0	45 5	14 16 0	21 8 0
"	2 0	6 6	9 0	22 0	4 10 0	16 0 0
South Australia ..	5 3	10 0¼	12 10⅜	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	27 0 0
Tasmania	3 6	8 6	11 0	40 10	12 5 0	30 0 0
"	2 0	6 0	6 6	27 0	5 15 2	20 0 0
Federal—						
Trans-Australian ..	4 8½	10 6	14 6	47 6½	15 0 0	40 0 0
Northern Territory	3 6	9 4	12 9	34 6	9 11 0	12 0 0
Oodnadatta ..	3 6	10 2	12 4	18 0	5 0 0	5 0 0

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

It will be observed that the dimensions adopted by the Federal Government for the Trans-Australian Railway are in excess of those at present in use on the 5-ft. 3-in. gauge lines of Victoria and South Australia, and the 4-ft. 8½-in. gauge lines of New South Wales. It is, however, the intention of the latter State to adopt the Federal standard as soon as possible, and with that end in view a commencement has been made in the Sydney suburban area in the enlargement of bridges, tunnels, buildings and platforms to enable the larger rolling stock to be employed. The question of standard couplings on the New South Wales lines is also receiving attention.

9. **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 nearly the whole of the railway traffic in the Commonwealth is in the hands of the various State Governments or of the Commonwealth Government. A large proportion of the private lines which are at present running have been laid down for the purpose of opening up forest lands, mining districts, or sugar areas, 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 1920. 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 1920. 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; the 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 most cases taken for the calendar year :—

GOVERNMENT AND PRIVATE RAILWAYS.—MILEAGE OPEN, 1855 TO 1920.

Year.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	Federal Territory	Nor. Ter.	C'wealth.
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
1855 ..	14	2½	..	6¾*a*	..	..	..	..	23¼
1861 ..	73	114	..	56	..	..	..	..	243
1871 ..	358	276	218	133	12	45	..	..	1,042
1881 ..	1,040	1,247	800	845	92	168	..	..	4,192
1890–1	2,263	2,763	2,205	1,666	656*b*	425*b*	..	145	10,123
1900–1	2,926	3,238	2,904	1,736	1,984	618*c*	..	145	13,551
1910–11	4,027	3,574	4,390	1,993	3,208	675	..	145	18,012
1914–15	4,439	3,936½	5,449¼	2,955	4,553	779½	5	146	22,263¼
1915–16	4,491¾	4,152½	6,452½	3,060¼	4,707½	758¼	5	146	23,773¾
1916–17	4,781¾	4,176½	6,702¼	3,241¾	4,878½	783¾	5	199½	24,769
1917–18	5,025	4,222¾	6,769½	3,356½	4,904¼	781¾	5	199½	25,264¼
1918–19	5,170	4,260½	6,841½	3,404	4,965½	811	5	199½	25,657
1919–20	5,377	4,284½	6,946¾	3,458¼	4,846	840¼	5	198¾	25,956½

(*a*) The line between Goolwa and Port Elliot was opened in 1854 as a horse tramway, but now forms part of the railway system. (*b*) To the 31st December, 1891. (*c*) 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 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 794 miles.

The reduction in the mileage in Western Australia is due to the fact that certain private railways have been dismantled. There was no change in the mileage of the Government railways during the year.

10. Comparative Mileage of Government and Private Lines, 1920.—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 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, 1920; those given for private lines are as nearly as possible to the 31st December, 1919:—

GOVERNMENT AND PRIVATE RAILWAYS.—MILEAGE OF GOVERNMENT LINES, OF PRIVATE LINES AVAILABLE FOR GENERAL TRAFFIC, AND OF PRIVATE LINES NOT SO AVAILABLE, 1919–20.

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.
	State.	Federal.				
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
New South Wales	5,015.32	..	189.32	5,204.64	172.35	5,376.99
Victoria ..	4,214.00	..	24.94	4,238.94	45.71	4,284.65
Queensland ..	5,685.10	..	278.68	5,963.78	982.91	6,946.69
South Australia	2,333.19	1,075.32	33.80	3,442.31	15.95	3,458.26
Western Australia	3,538.23	453.94	278.35	4,270.52	575.50	4,846.02
Tasmania ..	628.70	..	162.86	791.56	48.69	840.25
Federal Territory	..	4.94	..	4.94	..	4.94
Northern Territory	..	198.68	..	198.68	..	198.68
Total ..	21,414.54	1,732.88	967.95	24,115.37	1,841.11	25,956.48

11. Comparative Railway Facilities in Different States and Territories, 1920.—The relations to populations and areas respectively of the mileage of line open to the public for general traffic (including both Government and private lines) on the 30th June, 1920, are shewn in the subjoined statement for each State, the Federal and Northern Territories, and also for the Commonwealth:—

GOVERNMENT AND PRIVATE RAILWAYS.—COMPARISON OF RAILWAY FACILITIES IN DIFFERENT STATES AND TERRITORIES, 1920.

State or Territory.	Population, 30th June, 1920.	Area.	Mileage of Railway.	
			Per 1,000 of Population.	Per 1,000 sq. miles of Territory.
	Number.	Sq. miles.	Miles.	Miles.
New South Wales	2,028,673	309,432	2.56	16.82
Victoria	1,504,260	87,884	2.82	48.24
Queensland	737,085	670,500	8.09	8.89
South Australia	472,432	380,070	7.29	9.06
Western Australia	334,176	975,920	12.78	4.38
Tasmania	216,643	26,215	3.65	30.19
Federal Territory	2,222	940	2.22	5.26
Northern Territory	4,243	523,620	46.86	0.38
Commonwealth ..	5,299,734	2,974,581	4.55	8.11

12. Classification of Lines according to Gauge, 1919–20.—The subjoined table gives a classification, according to gauge, of the total mileage, exclusive of sidings and cross-overs, of (i) Commonwealth Government railways, given in the State or Territory in which situated; (ii) State Government railways; (iii) Private railways open to the

public for general traffic; and (iv) Private lines open for special purposes. Particulars of Government railways are up to the 30th June, 1920, of private railways open for general traffic to the 31st December, 1919, and of private railways open for special purposes to the 31st December, 1919, as nearly as possible.

GOVERNMENT AND PRIVATE RAILWAYS.—CLASSIFICATION ACCORDING TO GAUGE, 1919-20.

State or Territory in which situated.	Route 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. 3 in.	2 ft. 0 in.	1 ft. 8 in.	
FEDERAL RAILWAYS.									
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
South Australia ..	..	597.36	477.96	..	..	..	..	..	1,075.32
Western Australia	..	453.94	..	..	..	..	..	..	453.94
Federal Territory	..	4.94	..	..	..	..	..	..	4.94
Northern Territory	..	..	198.68	..	..	..	..	..	198.68
Total ..	..	1,056.24	676.64	..	..	..	..	..	1,732.88
STATE RAILWAYS.									
New South Wales	..	4,975.81	39.51	..	..	..	..	..	5,015.32
Victoria ..	4,092.10	..	..	..	121.90	..	..	..	4,214.00
Queensland ..	..	..	5,654.84	..	..	..	30.26	..	5,685.10
South Australia ..	1,123.60	..	1,209.59	..	..	..	..	..	2,333.19
Western Australia	..	..	3,538.23	..	..	..	..	..	3,538.23
Tasmania ..	..	..	605.12	..	..	..	23.58	..	628.70
Total ..	5,215.70	4,975.81	11,047.29	..	121.90	..	53.84	..	21,414.54
PRIVATE RAILWAYS OPEN FOR GENERAL TRAFFIC.									
New South Wales	45.00	81.40	36.67	..	..	..	26.25	..	189.32
Victoria ..	13.94	..	..	11.00	..	..	..	..	24.94
Queensland ..	..	..	113.09	..	7.00	..	158.59	..	278.68
South Australia ..	..	..	33.80	..	..	..	..	..	33.80
Western Australia	..	..	278.35	..	..	..	..	..	278.35
Tasmania ..	..	..	152.87	..	..	..	9.99	..	162.86
Total ..	58.94	81.40	614.78	11.00	7.00	..	194.83	..	967.95
PRIVATE RAILWAYS OPEN FOR SPECIAL PURPOSES.									
New South Wales	..	158.59	3.50	..	..	..	10.26	..	172.35
Victoria ..	28.83	..	..	4.40	..	..	12.48	..	45.71
Queensland ..	..	..	210.88	..	19.44	..	752.59	..	982.91
South Australia ..	..	..	..	..	2.00	3.60	10.35	..	15.95
Western Australia	..	..	517.00	..	..	..	29.00	29.50	575.50
Tasmania ..	..	..	31.63	..	..	..	17.06	..	48.69
Total ..	28.83	158.59	763.01	4.40	21.44	3.60	831.74	29.50	1,841.11
ALL RAILWAYS.									
New South Wales	45.00	5,215.80	79.68	..	..	..	36.51	..	5,376.99
Victoria ..	4,134.87	..	..	15.40	121.90	..	12.48	..	4,284.65
Queensland ..	..	..	5,978.81	..	26.44	..	941.44	..	6,946.69
South Australia	1,123.60	597.36	1,721.35	..	2.00	3.60	10.35	..	3,458.26
Western Australia	..	453.94	4,333.58	..	..	..	29.00	29.50	4,846.02
Tasmania ..	..	..	789.62	..	..	..	50.63	..	840.25
Federal Territory	..	4.94	..	..	..	..	..	..	4.94
Northern Territory	..	..	198.68	..	..	..	..	..	198.68
GRAND TOTAL ..	5,303.47	6,272.04	13,101.72	15.40	150.34	3.60	1,080.41	29.50	25,956.48

(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. In 1917 an Act was passed by which all the Federal railways are vested in a Commonwealth Railway Commissioner.

2. **Trans-Australian Railway (Kalgoorlie to Port Augusta).**—A Federal Act passed in 1907 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 completed in March, 1909. 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 1,063 miles, was £4,045,000. In September, 1911, a Bill was introduced into the Commonwealth Parliament to authorise the construction of the line, and it 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. On 12th September the ceremony of cutting the first sod was performed at Port Augusta by the Governor-General, Lord Denman, in the presence of a representative gathering, and on the 12th February, 1913, a like ceremony was performed at Kalgoorlie by the Prime Minister of the Commonwealth (the Right Hon. Andrew Fisher), and the line was thus commenced at both ends.

On the 17th October, 1917, the eastern and western divisions met at 621 miles 58 chains ex Kalgoorlie, and railway communication between Western Australia and the eastern States was established.

In the issue of the Year Book for 1918 (No. 11, pp. 663 to 666 and p. 1213) a short description was given of the country through which the line passes between Kalgoorlie and Port Augusta, together with particulars of the rate of construction, permanent way, water supply, rolling stock, etc.

On the 22nd October, 1917, the first through train left Port Augusta with an official party on board for Kalgoorlie. It should be mentioned that owing to deviations from the original route, the length of this line was reduced from 1,063.39 miles to 1,051.30 miles, a saving of 12.09 miles.

3. **Oodnadatta Railway.**—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. From the 1st January, 1914, the line has been worked by the South Australian Government for and on behalf of the Commonwealth. 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. **Federal Territory Railway—Queanbeyan-Canberra.**—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 since worked the line for and on behalf of the Commonwealth Government. The line was opened for departmental goods traffic on 25th May, 1914. It connects with the New South Wales railway system at Queanbeyan, is 4.94 miles in length, and has sidings of an aggregate length of 2.00 miles.

5. **Northern Territory Railway (Darwin to Katherine).**—On the 1st January, 1911, the line from Darwin to Pine Creek came under the jurisdiction of the then Department of External Affairs, and was worked under the Administrator of the Northern Territory. As mentioned above, the management of this railway is now vested in the Commonwealth Railway Commissioner.

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 has been completed, and the first train ran through to Emungalen (Katherine River) on 13th May, 1917.

6. **Summary of Federal Railways.**—The following table shews the railway lines open for traffic under the control of the Commonwealth Government at 30th June, 1920, together with the lines which have been or are being surveyed :—

FEDERAL GOVERNMENT RAILWAYS, 30th JUNE, 1920.

Terminals.	Miles.
OPEN FOR TRAFFIC.	
Trans-Australian—Port Augusta to Kalgoorlie	1,051.30
Port Augusta to Oodnadatta (South Australia)	477.96
Canberra to Queanbeyan (Federal Territory)	4.94
Darwin to Emungalen, Katherine River (Northern Territory)	198.68
Total opened for traffic	1,732.88
SURVEYED, OR BEING SURVEYED.	
Katherine River to Mataranka (Northern Territory)	65.44
Mataranka to Daly Waters (Northern Territory)	95.00
Kingoonya to Boorthanna (South Australia)	176.44
Canberra to Jervis Bay (Federal Territory)	140.22
Canberra (Federal Territory) to Federal Territory Border in the direction of Yass (New South Wales)	11.67
Daly Waters (Northern Territory) to Oodnadatta (South Australia) ..	851.50
Port Augusta to Crystal Brook (South Australia)	69.25
Total surveyed or being surveyed	1,409.52

7. **Mileage open for traffic, Average miles worked and Train miles run.**—The following table shews the length of the Federal railways open for traffic, average miles worked, and the train miles run in the years 1916 to 1920 :—

FEDERAL RAILWAYS.—MILEAGE OPEN FOR TRAFFIC, AVERAGE MILES WORKED AND TRAIN MILES RUN, 1916 TO 1920.

Year ended 30th June.	Railway.				Total.
	Trans-Australian.	Oodnadatta.	Federal Territory.	Northern Territory.	
	MILES OPEN FOR TRAFFIC.				
	Miles.	Miles.	Miles.	Miles.	Miles.
1916	773	478	5	146	1,402
1917	958	478	5	200	1,641
1918	1,051	478	5	200	1,734
1919	1,051	478	5	200	1,734
1920	1,051	478	5	199	1,733

FEDERAL RAILWAYS.—MILEAGE OPEN FOR TRAFFIC, AVERAGE MILES WORKED AND TRAIN MILES RUN, 1916 TO 1920—*continued.*

Year ended 30th June.	Railway.				Total.
	Trans-Australian.	Oodnadatta.	Federal Territory.	Northern Territory.	
AVERAGE MILES WORKED.					
	Miles.	Miles.	Miles.	Miles.	Miles.
1916	668	478	5	146	1,297
1917	865	478	5	187	1,535
1918	1,051	478	5	200	1,734
1919	1,051	478	5	200	1,734
1920	1,051	478	5	199	1,733
TRAIN MILES RUN.					
1916	622,919	276,690	1,080	52,424	953,113
1917	570,493	254,927	1,169	87,652	914,241
1918	475,936	259,838	1,127	112,648	849,549
1919	368,886	221,763	1,015	83,209	674,873
1920	401,709	262,917	1,000	60,348	725,974

8. **Cost of Construction and Equipment of Federal Railways.**—In the following table particulars are given of the cost of construction and equipment for traffic of the undermentioned railways for each of the years 1915–16 to 1919–20 :—

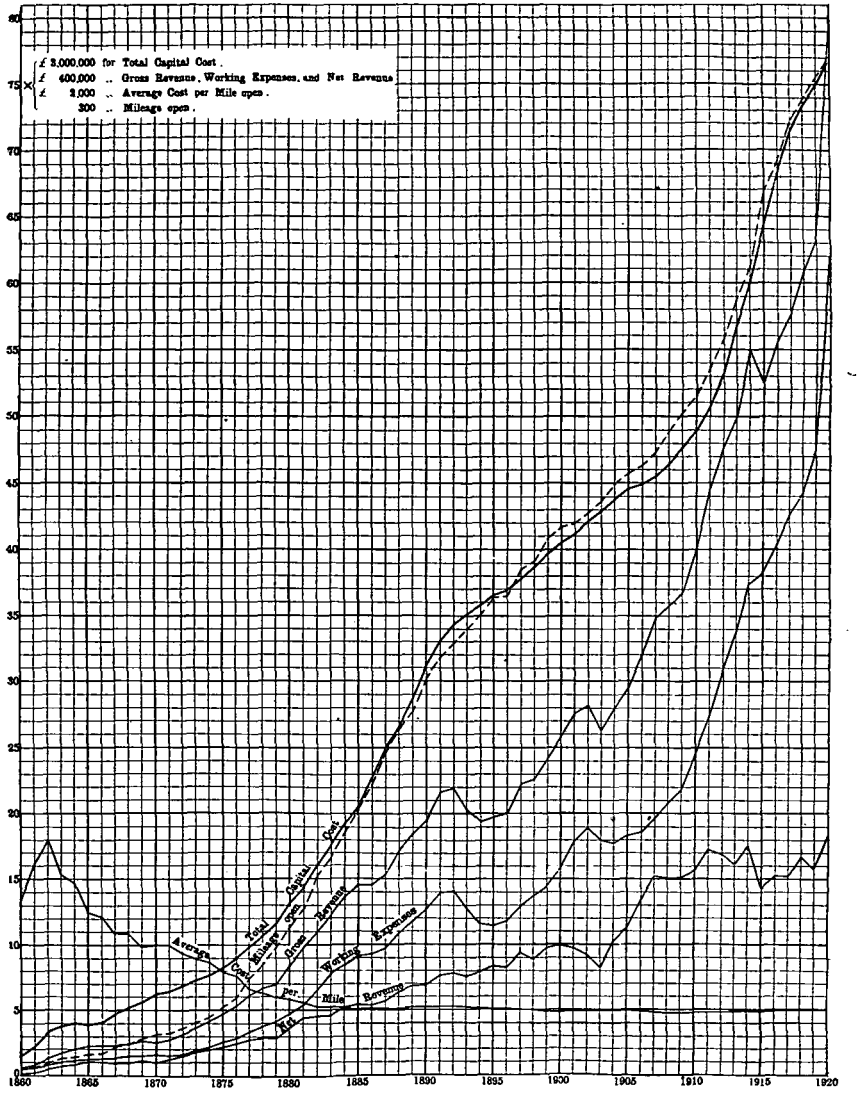
FEDERAL RAILWAYS.—CAPITAL COST OF CONSTRUCTION AND EQUIPMENT, 1916 TO 1920.

Year ended 30th June.	Railway.				Total.
	Trans-Australian.	Oodnadatta. (*a*)	Federal Territory. (*b*)	Northern Territory.	
TOTAL COST OF CONSTRUCTION AND EQUIPMENT OF LINES OPEN.					
	£	£	£	£	£
1916	4,747,062	2,158,355	47,103	1,055,754	8,008,274
1917	6,079,313	2,281,271	52,591	1,664,370	10,077,545
1918	6,674,278	2,281,939	47,883	1,695,556	10,699,656
1919	6,911,624	2,282,973	48,124	1,707,392	10,950,113
1920	7,053,900	2,282,934	48,144	1,709,932	11,094,910
COST PER MILE OPEN.					
1916	6,141	4,515	9,421	7,231	5,712
1917	6,353	4,773	10,651	8,340	6,141
1918	6,349	4,774	9,693	8,496	6,171
1919	6,574	4,776	9,742	8,556	6,316
1920	6,710	4,776	9,746	8,607	6,402

(*a*) Exclusive of Rolling Stock the property of South Australian Government Railways.
(*b*) Exclusive of Rolling Stock the property of New South Wales Government Railways.

9. **Gross Revenue.**—(i) *Total, per average mile worked, and per train mile run.* The following table shows the total revenue from all sources, the revenue per average mile worked and the revenue per train mile run for each of the undermentioned railways for the financial years from 1916 to 1920 inclusive :—

GRAPHS SHEWING THE FINANCIAL POSITION OF THE GOVERNMENT RAILWAYS OF THE COMMONWEALTH, 1860 TO 1920.



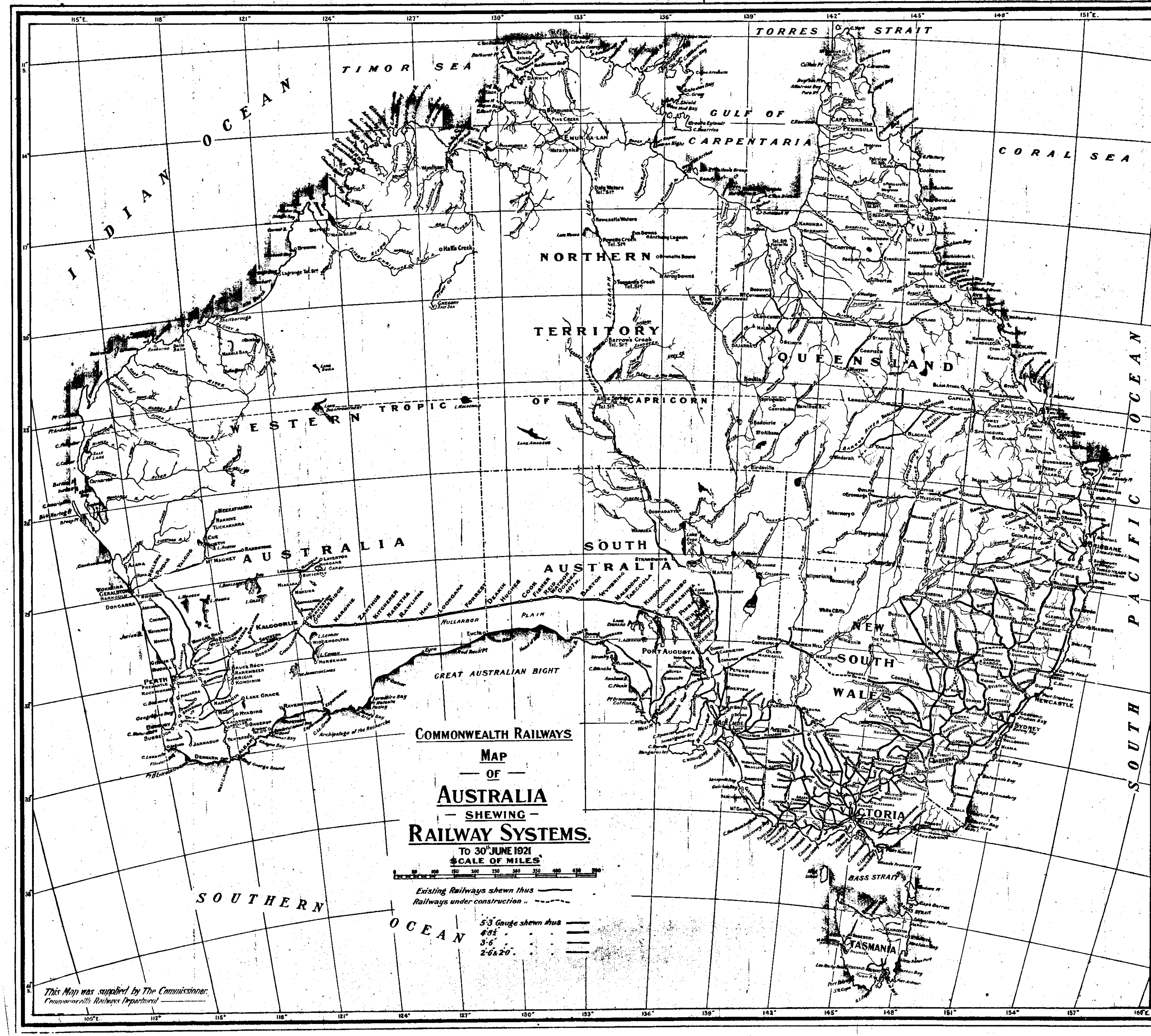
(See page 584.)

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.

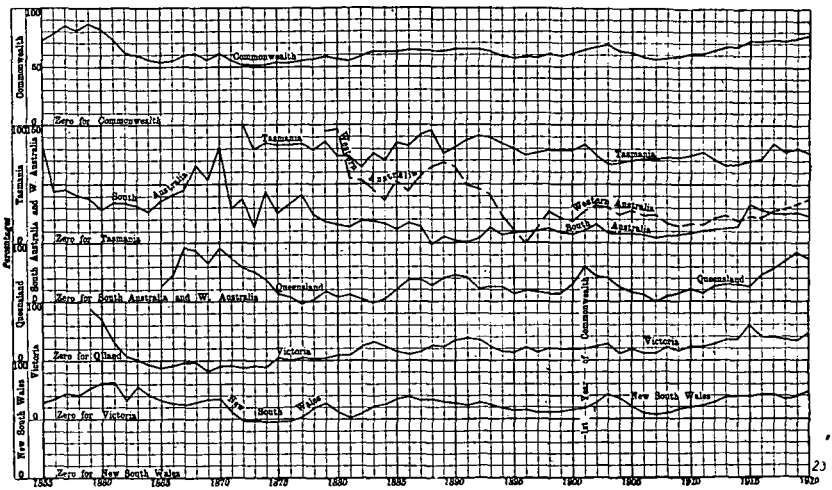
In the heavy curve denoting the total capital cost of the railways of the Commonwealth, the vertical side of each square denotes £3,000,000.

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 £2,000. The mileage open is shewn by a dotted curve, the vertical side of each square representing 300 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 573 and 574 respectively.


COMMONWEALTH RAILWAYS
MAP
OF
AUSTRALIA
SHEWING
RAILWAY SYSTEMS.
TO 30th JUNE 1921
SCALE OF MILES
0 50 100 150 200 250 300 350 400 450 500
Existing Railways shewn thus
Railways under construction
5'3" Gauge shewn thus
4'8½"
3'6"
2'6" & 2'0"
This Map was supplied by The Commissioner.
Commonwealth Railways Department
INDIAN OCEAN
TIMOR SEA
TORRES STRAIT
GULF OF CARPENTARIA
CORAL SEA
SOUTH PACIFIC OCEAN
SOUTHERN OCEAN
GREAT AUSTRALIAN BIGHT
BASS STRAIT
TROPIC OF CAPRICORN
WESTERN AUSTRALIA
NORTHERN TERRITORY
QUEENSLAND
SOUTH AUSTRALIA
NEW SOUTH WALES
VICTORIA
TASMANIA
NULLARBOR PLAIN
PERTH
KALGOORLIE
DARWIN
PORT AUGUSTA
ADELAIDE
MELBOURNE
SYDNEY
NEWCASTLE
BRISBANE
ROCKHAMPTON
TOWNSVILLE
BROKEN HILL
OVERLAND TELEGRAPH LINE

GRAPHS SHEWING PERCENTAGES OF WORKING EXPENSES TO GROSS REVENUE OF GOVERNMENT RAILWAYS FOR STATES AND COMMONWEALTH, 1855 TO 1920.

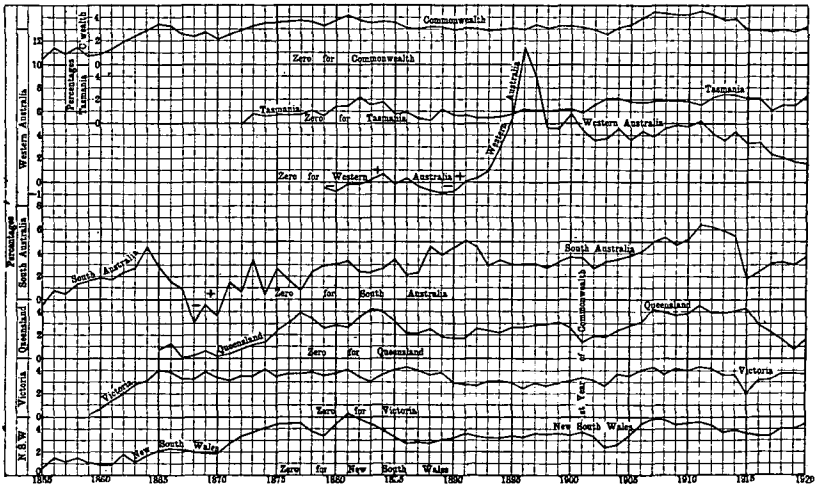


(See page 591.)

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 New South Wales commences in 1855 ; that 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 OF STATES AND COMMONWEALTH, 1855 TO 1920.



(See page 593.)

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 is 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 New South Wales commences in 1855; that 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.

FEDERAL RAILWAYS.—GROSS REVENUE, TOTAL, PER AVERAGE MILE WORKED AND PER TRAIN MILE RUN, 1916 TO 1920.

Year ended 30th June.	Railway.				Total.
	Trans-Australian.	Oodnadatta.	Federal Territory.	Northern Territory.	
TOTAL GROSS REVENUE.					
	£	£	£	£	£
1916	273,959	64,518	1,040	31,518	371,035
1917	290,750	66,429	592	28,695	386,466
1918	175,039	69,231	705	32,511	277,486
1919	175,134	58,286	407	32,237	266,064
1920	213,388	74,709	571	27,089	315,757
GROSS REVENUE PER AVERAGE MILE WORKED.					
1916	410	135	208	216	286
1917	336	139	120	153	252
1918	166	145	141	163	160
1919	167	122	82	162	153
1920	203	156	116	136	182
GROSS REVENUE PER TRAIN-MILE RUN.					
	d.	*d.*	*d.*	*d.*	*d.*
1916	105.55	55.96	231.11	144.29	93.43
1917	122.32	62.54	121.54	78.57	101.45
1918	88.27	63.95	150.13	69.27	78.39
1919	113.94	63.08	96.24	92.98	94.62
1920	127.49	68.25	137.04	107.73	104.39

(ii) *Coaching, Goods, and Miscellaneous Receipts, and Percentages on total Revenue.* 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 1916 to 1920 classified according to the three chief sources of receipts, together with their percentages on the total revenue. The respective totals of the three items have already been given in the preceding paragaph.

FEDERAL RAILWAYS.—COACHING, GOODS, AND MISCELLANEOUS RECEIPTS, AND PERCENTAGES ON TOTAL REVENUE, 1916 TO 1920.

Year ended 30th June.	Receipts.					Percentages.				
	Railway.				Total.	Railway.				Total.
	Trans-Australian.	Oodnadatta.	Federal Territory.	Northern Territory.		Trans-Australian.	Oodnadatta.	Federal Territory.	Northern Territory	
COACHING TRAFFIC RECEIPTS.										
	£	£	£	£	£	%	%	%	%	%
1916 ..	3,582	14,501	37	4,633	22,753	1.31	22.48	3.56	14.70	6.13
1917 ..	4,411	15,447	39	5,412	25,309	1.52	23.25	6.59	18.86	6.55
1918 ..	72,352	14,586	31	5,341	92,310	41.33	21.07	4.40	16.43	33.27
1919 ..	93,867	12,455	34	5,250	111,606	53.60	21.37	8.25	16.28	41.95
1920 ..	95,671	10,600	15	4,433	110,719	44.83	14.19	2.63	16.36	35.07
GOODS AND LIVE STOCK RECEIPTS.										
1916 ..	249,129	48,482	1,003	16,735	315,349	90.94	75.14	96.44	53.10	84.99
1917 ..	271,013	48,026	553	17,152	336,744	93.21	72.30	93.41	59.77	87.13
1918 ..	77,339	51,213	674	19,539	148,765	41.19	73.97	95.60	60.10	53.61
1919 ..	50,485	43,194	373	19,676	113,728	28.83	74.11	91.75	61.04	42.74
1920 ..	82,490	61,401	453	14,930	159,274	38.67	82.19	79.33	55.12	50.44
MISCELLANEOUS RECEIPTS.										
1916 ..	21,248	1,535	..	10,150	32,933	7.75	2.38	..	32.20	8.88
1917 ..	15,326	2,956	..	6,131	24,413	5.27	4.45	..	21.37	6.32
1918 ..	25,348	3,432	..	7,631	36,411	14.48	4.96	..	23.47	13.12
1919 ..	30,783	2,636	..	7,311	40,730	17.57	4.52	..	22.68	15.31
1920 ..	35,227	2,708	103	7,726	45,764	16.50	3.62	18.04	28.52	14.49

10. Working Expenses.—(i) *Total.* The following table shews the total annual expenditure on (*a*) maintenance of ways, works and buildings; (*b*) locomotives, carriages and wagons repairs and renewals, (*c*) traffic expenses, and (*d*) compensation, general and miscellaneous charges, and the percentages of the total of those expenses upon the corresponding gross revenues of each railway for each year 1916 to 1920 :—

FEDERAL RAILWAYS.—TOTAL WORKING EXPENSES, AND PERCENTAGES OF WORKING EXPENSES ON GROSS REVENUE, 1916 TO 1920.

Year ended 30th June.	Railway.				Total.
	Trans-Australian.	Oodnadatta.	Federal Territory.	Northern Territory.	
TOTAL WORKING EXPENSES.					
	£	£	£	£	£
1916	273,959	95,069	1,638	47,953	418,619
1917	290,750	102,298	1,446	39,771	434,265
1918	232,468	100,179	1,496	53,482	387,625
1919	243,988	111,362	1,288	50,617	407,255
1920	256,028	112,191	802	48,616	417,637
PERCENTAGE OF WORKING EXPENSES ON REVENUE.					
	%	%	%	%	%
1916	100.00	147.35	157.50	152.14	112.82
1917	100.00	153.99	244.26	138.60	112.37
1918	132.81	144.70	212.20	164.50	139.69
1919	139.31	191.06	316.45	157.02	153.07
1920	119.98	150.17	140.46	179.47	132.26

(ii) *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 for each railway for the years 1916 to 1920 :—

FEDERAL RAILWAYS.—WORKING EXPENSES PER AVERAGE MILE WORKED, AND PER TRAIN MILE RUN, 1916 TO 1920.

Year ended 30th June.	Railway.				Total.
	Trans-Australian.	Oodnadatta.	Federal Territory.	Northern Territory.	
WORKING EXPENSES PER AVERAGE MILE WORKED.					
	£	£	£	£	£
1916	410	199	328	328	323
1917	336	214	293	212	283
1918	221	198	299	267	220
1919	232	233	261	254	235
1920	243	235	162	245	241
WORKING EXPENSES PER TRAIN-MILE RUN.					
	d.	*d.*	*d.*	*d.*	*d.*
1916	105.55	82.46	364.00	219.53	105.41
1917	122.32	96.31	296.87	108.90	114.00
1918	117.23	87.25	318.58	113.95	107.89
1919	158.74	120.52	304.55	145.99	145.00
1920	152.96	102.41	192.40	193.34	138.07

(iii) *Distribution of Working Expenses.* The subjoined table shews the distribution of working expenses among four chief heads of expenditure for the years 1916 to 1920 :—

FEDERAL RAILWAYS.—DISTRIBUTION OF WORKING EXPENSES, 1916 TO 1920.

Year ended 30th June.	Railway.				Total.
	Trans-Australian.	Oodnadatta.	Federal Territory.	Northern Territory.	
MAINTENANCE.					
	£	£	£	£	£
1916	66,820	38,742	942	25,291	131,795
1917	69,232	46,921	768	18,858	135,779
1918	64,990	39,673	609	23,699	128,971
1919	71,309	45,284	601	21,500	138,694
1920	72,197	43,967	553	20,664	137,381
LOCOMOTIVE, CARRIAGE, AND WAGON CHARGES.					
1916	156,818	45,672	389	16,738	219,617
1917	179,817	44,487	361	15,983	240,648
1918	121,574	42,582	544	22,309	187,009
1919	118,163	52,377	351	20,796	191,687
1920	119,753	53,437	196	19,841	193,227
TRAFFIC EXPENSES.					
1916	47,211	9,106	307	3,942	60,566
1917	37,808	9,295	317	4,930	52,350
1918	41,022	10,400	343	5,704	57,469
1919	47,572	11,471	336	7,104	66,483
1920	54,606	12,803	52	6,881	74,342
OTHER CHARGES.					
1916	3,110	1,549	..	1,982	6,641
1917	3,893	1,595	..	..	5,488
1918	4,882	1,804	..	1,769	8,455
1919	6,944	2,230	..	1,217	10,391
1920	9,471	1,985	..	1,231	12,687

11. **Passenger Journeys and Tonnage of Goods and Live Stock.**—In the next table particulars are given of the passenger journeys, and tonnage of goods and live stock carried on the Federal Railways during the years 1916 to 1920 :—

FEDERAL RAILWAYS.—PASSENGER JOURNEYS, AND TONNAGE OF GOODS AND LIVE STOCK CARRIED, 1916 TO 1920.

Year ended 30th June.	Railway.				Total.
	Trans-Australian.	Oodnadatta.	Federal Territory.	Northern Territory.	
PASSENGER JOURNEYS.					
	No.	No.	No.	No.	No.
1916	7,667	(*a*)	1,079	4,718	(*b*) 13,464
1917	4,160	(*a*)	1,578	8,034	(*b*) 13,772
1918	17,934	(*a*)	300	11,546	(*b*) 29,780
1919	23,942	51,516	93	5,842	81,393
1920	22,968	55,742	..	4,818	83,528
TONNAGE OF GOODS AND LIVE STOCK CARRIED.					
	tons.	tons.	tons.	tons.	tons.
1916	248,744	(*a*)	12,114	30,007	(*b*) 290,865
1917	583,250	(*a*)	6,586	27,529	(*b*) 617,365
1918	124,806	(*a*)	7,261	40,862	(*b*) 172,929
1919	116,971	57,565	4,385	35,124	214,045
1920	53,722	94,892	4,691	23,122	176,427

(*a*) Not available. (*b*) Exclusive of Oodnadatta line.

12. **Number and Description of Rolling Stock, 1920.**—The following table shews the numbers of locomotives and rolling stock in use on the Federal railways, classified according to gauge :—

FEDERAL RAILWAYS.—CLASSIFICATION OF LOCOMOTIVES AND ROLLING STOCK, 1919-20.

Railway.	Gauge.			Gauge.			Gauge.		
	4 ft. 8½ in.	3 ft. 6 in.	Total.	4 ft. 8½ in.	3 ft. 6 in.	Total.	4 ft. 8½ in.	3 ft. 6 in.	Total.
	Locomotives.			Passenger Vehicles.			Vehicles other than Passenger.		
Trans-Australian	70	..	70	33	..	33	746	..	746
Oodnadatta (*a*)	..	1	1	..	..	..	..	31	31
Federal Territory (*b*)	..	..	..	..	..	..	..	..	..
Northern Territory	..	13	13	..	4	4	..	311	311
Total ..	70	14	84	33	4	37	746	342	1,088

(*a*) Worked by South Australian Government Railways. (*b*) Worked by New South Wales Government Railways.

13. **Number of Railway Employees.**—The following table shews the number of employees on the Federal railways at 30th June in each year, 1916 to 1920 inclusive, classified according to salaried and wages staffs :—

FEDERAL RAILWAYS.—NUMBER OF EMPLOYEES ON RAILWAYS, 1916 TO 1920.

Railway.	30th June—									
	1916.		1917.		1918.		1919.		1920.	
	Salaried Staff.	Wages Staff.	Salaried Staff.	Wages Staff.	Salaried Staff.	Wages Staff.	Salaried Staff.	Wages Staff.	Salaried Staff.	Wages Staff.
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Trans-Australian	82	873	157	2,981	201	913	194	846	184	798
Oodnadatta ..	(*a*)	(*a*)	(*a*)	(*a*)	(*a*)	(*a*)	(*a*)	(*a*)	(*a*)	(*a*)
Federal Territory	(*b*)	(*b*)	(*b*)	(*b*)	(*b*)	(*b*)	(*b*)	(*b*)	(*b*)	(*b*)
Northern Territory	11	129	16	161	12	164	20	150	12	79
Total ..	93	1,002	173	3,142	213	1,077	214	996	196	877

(*a*) Worked by South Australian Government Railways.
(*b*) Worked by New South Wales Government Railways.

14. **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 in each year ended 30th June, 1916 to 1920, on the Federal railways :—

FEDERAL RAILWAYS.—TOTAL NUMBER OF PERSONS KILLED AND INJURED ON FEDERAL RAILWAYS, 1916 TO 1920.

Railway.	1916.	1917.	1918.	1919.	1920.
	Number of Persons Killed.				
Trans-Australian	1	1	3	3	2
Oodnadatta	..	..	1	..	..
Federal Territory	..	..	..	..	..
Northern Territory	1	..	..	..	..
Total	2	1	4	3	2
	Number of Persons Injured.				
Trans-Australian	16	37	139	104	42
Oodnadatta	6	4	12	8	12
Federal Territory	..	..	..	..	..
Northern Territory	1	2	7	3	8
Total	23	43	158	115	62

15. **Passenger Fares, Goods Rates, and Parcel Rates.**—(i) *Passenger Fares.* In the following table the fares for certain specified distances on the Trans-Australian, Oodnadatta, and Northern Territory Railways are set out :—

FEDERAL RAILWAYS.—ORDINARY PASSENGER MILEAGE RATES, 1920.

Single Fare for a Journey of—	Trans-Australian Railway.				Oodnadatta Railway.				Northern Territory Railway.			
	First Class.		Second Class.		First Class.		Second Class.		First Class.		Second Class.	
	Fare.	Average per Passenger Mile.	Fare.	Average per Passenger Mile.	Fare.	Average per Passenger Mile.	Fare.	Average per Passenger Mile.	Fare.	Average per Passenger Mile.	Fare.	Average per Passenger Mile.
Miles.	s. d.	d.	s. d.	d.	s. d.	d.	s. d.	d.	s. d.	d.	s. d.	d.
50	8 4	2.00	5 7	1.34	9 9	2.34	6 6	1.56	10 5	2.50	7 0	1.68
100	16 8	2.00	11 1	1.33	19 6	2.34	13 0	1.56	20 10	2.50	13 10	1.66
200	33 4	2.00	22 3	1.34	39 0	2.34	26 0	1.56	41 8	2.50	27 10	1.67
300	50 0	2.00	33 4	1.33	58 6	2.34	39 0	1.56	..	..	..	..
400	64 7	1.94	43 1	1.29	77 9	2.33	52 0	1.56	..	..	..	..
500	77 1	1.85	51 5	1.23	..	..	..	..	..	..	..	..
600	89 7	1.79	59 9	1.20	..	..	..	..	..	..	..	..
700	102 1	1.75	68 1	1.17	..	..	..	..	..	..	..	..
800	110 5	1.66	73 8	1.11	..	..	..	..	..	..	..	..
900	117 9	1.57	78 6	1.05	..	..	..	..	..	..	..	..
1,000	122 11	1.48	81 11	0.98	..	..	..	..	..	..	..	..
1,051	125 0	1.43	83 4	0.95	..	..	..	..	..	..	..	..

In the case of the Trans-Australian railway, through passengers have to pay for sleeping berths and meals in addition to the ordinary fares. For the first class sleeping berths the charge is twelve shillings and sixpence for a night or part of a night, the corresponding charge for the second class being eight shillings. There is a fixed scale of charges made in respect of the meals served to other than through passengers between Port Augusta and Kalgoorlie. It will be observed that both the first and second class fares on the Trans-Australian railway have a constant rate for distances up to 300 miles and then have a tapering character beyond that distance; while those for the Oodnadatta and the Northern Territory railways are practically uniform for all distances.

(ii) *Goods Rates.* The rates for agricultural produce and ordinary goods on the Trans-Australian and Northern Territory railways are set out in the following tables :—

FEDERAL RAILWAYS.—RATES FOR AGRICULTURAL PRODUCE IN TRUCK LOADS, 1920.

For a haul of—	Northern Territory Railway.		Trans-Australian Railway.		For a haul of—	Trans-Australian Railway, *contd.*	
	Rate per Ton in Truck Loads.	Average per Ton Mile.	Rate per Ton in Truck Loads.	Average per Ton Mile.		Rate per Ton in Truck Loads.	Average per Ton Mile.
	s. d.	d.	s. d.	d.		s. d.	d.
50 miles ..	8 8	2.08	6 11	1.66	600 miles ..	38 4	0.77
100 „ ..	15 3	1.83	12 2	1.46	700 „ ..	42 6	0.73
200 „ ..	19 3	1.16	15 5	0.93	800 „ ..	46 8	0.70
300 „ ..	..	..	21 8	0.87	900 „ ..	50 5	0.67
400 „ ..	..	..	27 6	0.83	1,000 „ ..	53 9	0.65
500 „ ..	..	..	33 4	0.80	1,051 „ ..	55 0	0.63

FEDERAL RAILWAYS.—ORDINARY GOODS MILEAGE RATES, 1920.

For a Haul of—	Northern Territory Railway. Class of Freight. Highest. Rate per Ton.	Northern Territory Railway. Class of Freight. Highest. Average per Ton Mile.	Northern Territory Railway. Class of Freight. Lowest. Rate per Ton.	Northern Territory Railway. Class of Freight. Lowest. Average per Ton Mile.	Trans-Australian Railway. Class of Freight. Highest. Rate per Ton.	Trans-Australian Railway. Class of Freight. Highest. Average per Ton Mile.	Trans-Australian Railway. Class of Freight. Lowest. Rate per Ton.	Trans-Australian Railway. Class of Freight. Lowest. Average per Ton Mile.
Miles.	s. d.	d.	s. d.	d.	s. d.	d.	s. d.	d.
50	39 5	9.46	6 9	1.62	31 6	7.56	5 5	1.30
100	71 11	8.63	10 11	1.31	57 6	6.90	8 9	1.05
200	133 2	7.99	19 3	1.16	106 6	6.39	15 5	0.93
300	..	..	..	..	143 0	5.72	21 8	0.87
400	..	..	..	..	172 2	5.17	27 6	0.83
500	..	..	..	..	201 4	4.83	33 4	0.80

For a Haul of—	Trans-Australian Railway, *contd.* Class of Freight. Highest. Rate per Ton.	Trans-Australian Railway, *contd.* Class of Freight. Highest. Average per Ton Mile.	Trans-Australian Railway, *contd.* Class of Freight. Lowest. Rate per Ton.	Trans-Australian Railway, *contd.* Class of Freight. Lowest. Average per Ton Mile.
Miles.	s. d.	d.	s. d.	d.
600	223 9	4.48	38 4	0.77
700	239 5	4.10	42 6	0.73
800	255 0	3.83	46 8	0.70
900	269 1	3.59	50 5	0.67
1,000	281 7	3.38	53 9	0.65
1,051	287 6	3.28	55 0	0.63

In the above tables it will be seen that the average rates per ton-mile are of a tapering character.

(iii) *Parcel Rates.* On the Trans-Australian railway, parcels weighing between 85 and 112 lbs. are taken by passenger train 500 miles for thirteen shillings and threepence.

(C) State Railways.

1. **Mileage Open, 1916 to 1920.**—The following table shews the length of State railways open for traffic on the 30th June in the years 1916 to 1920:—

STATE RAILWAYS.—MILEAGE OPEN FOR TRAFFIC, 1916 TO 1920.

Year ended 30th June.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	All States.
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
1916	4,188	4,100	4,967	2,187	3,332	562	19,336
1917	4,437	4,123	5,214	2,221	3,425	581	20,001
1918	4,678	4,152	5,295	2,242	3,491	588	20,446
1919	4,825	4,190	5,469	2,290	3,538	601	20,913
1920	5,015	4,214	5,685	2,333	3,538	629	21,414

The following statement shews the actual mileage opened for traffic in the year 1919–20, and also the annual average increase in mileage opened since 1910 in each State:—

STATE RAILWAYS.—MILEAGE OPENED ANNUALLY.

Mileage.	N.S.W.	Vic.	Q'land.	S. Aust.	W. Aust.	Tas.	Total all States.
Mileage opened during 1919-20	190.66	24.48	215.65	43.21	..	27.16	501.16
Average annual mileage increase in 10 years to 30th June, 1920 ..	125.81	69.05	181.72	87.57	116.27	15.84	596.26

(i) *New South Wales.* During the year ended 30th June, 1920, the following lines were opened for traffic:—Kempsey to Macksville (29.94 miles); Picton-Mittagong Deviation (27.65 miles); Menindie to Broken Hill (73.65 miles); Craboon to Coolah (23.75 miles); Henty to Rand (32.81 miles); Penrith to Weatherboard (3.03 miles); Picton to Mittagong (0.41 miles). These, less reduction of 0.58 miles on Broken Hill-Tarrawingee lines, make a total of 190.66 miles.

(ii) *Victoria.* The following lines were opened for traffic during 1919–20:—Piangil to Tank (15.87 miles); and Mittyack to Kulwin (8.61 miles); a total of 24.48 miles.

(iii) *Queensland.* The increase of 215.65 miles in the mileage opened for traffic in 1919–20 was due to the opening of the following lines:—Samsonvale to Kobble (2.82 miles); Cotton Vale to Amiens (12.31 miles); Orallo to Injune (32.69 miles); Bambaroo to Toobanna (10.73 miles); Toobanna to Ingham (4.92 miles); North Coast Junction to Innisfail Junction (0.91 miles); Moolaba to Daradgee (8.95 miles); a total of 73.33 miles; and to the acquisition of the line from Almaden to Forsyth (Etheridge Railway), 142.32 miles.

(iv) *South Australia.* During the year 1919–20 the line from Monarto to Sedan (43.21 miles) on the 5 ft. 3 in. gauge was opened for traffic.

(v) *Western Australia.* There were no additional new lines opened during the year 1919–20.

(vi) *Tasmania.* During the year 1919–20 the line from Stanley to Trowutta (26.54 miles) was opened for traffic, and the extension from Abattoirs to Zinc Works (0.62 miles) was completed and taken over.

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 on page 580 gives the total 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 1916 to 1920 inclusive:—

STATE RAILWAYS.—AVERAGE MILEAGE WORKED, TRAIN MILES RUN, NUMBER OF PASSENGER JOURNEYS, AND TONNAGE OF GOODS AND LIVE STOCK CARRIED, 1916 TO 1920.

Year ended 30th June.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania. (a)	All States.
AVERAGE MILEAGE WORKED.							
1916 ..	4,169	3,955	4,939	2,185	3,332	552	19,132
1917 ..	4,313	4,104	5,067	2,193	3,370	577	19,624
1918 ..	4,551	4,139	5,281	2,235	3,463	591	20,260
1919 ..	4,737	4,159	5,324	2,285	3,507	599	20,611
1920 ..	4,966	4,194	5,635	2,316	3,538	635	21,284
TRAIN MILES RUN.							
1916 ..	21,556,034	13,826,538	11,571,746	5,630,984	5,149,289	1,051,511	58,786,102
1917 ..	20,300,717	14,022,040	10,729,187	5,730,539	4,500,211	1,080,459	56,363,153
1918 ..	18,143,267	13,626,371	10,319,694	5,440,515	4,094,510	1,056,373	52,680,730
1919 ..	19,935,202	13,031,655	9,942,744	5,412,924	4,256,627	1,107,890	53,687,042
1920 ..	22,834,889	15,022,465	10,443,619	5,192,038	4,851,446	1,266,625	59,611,082
NUMBER OF PASSENGER JOURNEYS.							
1916 ..	92,850,838	115,771,238	24,438,905	20,512,753	18,884,541	2,078,228	274,536,503
1917 ..	96,709,846	108,341,540	24,837,714	18,107,015	17,466,744	1,971,888	267,434,747
1918 ..	94,304,516	105,753,073	25,682,368	18,936,104	16,081,695	1,874,029	262,631,785
1919 ..	98,568,768	111,904,786	26,414,817	20,176,544	17,325,424	1,889,102	276,279,441
1920 ..	114,654,660	134,012,162	28,177,817	22,852,116	18,411,231	2,267,856	320,375,842
TONNAGE OF GOODS AND LIVE STOCK CARRIED.							
1916 ..	11,915,500	5,829,835	4,570,883	2,396,938	2,554,858	388,782	27,656,796
1917 ..	11,732,864	5,962,602	4,035,379	2,822,401	2,400,246	401,076	27,354,568
1918 ..	11,293,060	6,231,093	4,154,441	2,767,734	2,259,070	407,405	27,112,803
1919 ..	12,714,012	6,515,470	3,783,334	2,618,510	2,379,403	472,926	28,483,655
1920 ..	13,293,528	7,770,694	3,790,881	2,578,903	2,613,606	575,169	30,622,786

(a) The average mileage worked in some cases is greater than the actual mileage open, owing to the fact that the Government railways have running powers over certain private lines.

3. Length and Gauge of Railway Systems in each State.—A map shewing the various Commonwealth and State owned railway lines, is given on page 571. In all the States the Government railways are grouped, for the convenience of administration and management, into several divisions or systems. A summary shewing 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, 1918, was given in Year Book No. 12, pp. 646 and 651 to 653. Owing to limitations of space this information for the year ended 30th June, 1920, is not included in the present volume, but may be found in Transportation Bulletin No. 12 to be issued by this Bureau.

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 adopted 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 earlier issues of the Year Book (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 Lines Authorised, 1920.—The following statement gives particulars up to the 30th June, 1920, 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, 1920.

Particulars.	N.S.W.	Vic.	Q'land.	S.A.	W.A.	Tas.	All States.
Mileage under construction	*a* 627.13	92.45	*b* 590.00	77.63	113.25	33.37	1,533.83
Mileage authorised but not commenced ..	100.02	20.00	1,429.00	264.75	92.50	..	1,906.27

(*a*) Exclusive of 182.58 miles on which work was suspended.
(*b*) Exclusive of 97.00 miles on which work has been suspended.

(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 of 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 consist of 312 miles of " pioneer lines " built to afford railway communication over level country suitable for settlement by returned soldiers. In addition there are 200 miles of a more expensive character passing through mountainous districts. The line from Coff's Harbour to Glenreagh (26.40 miles) will form part of the North Coast Railway, which will eventually be connected with Brisbane. The line from Molong to Dubbo (79.94 miles) will assist in the development of the Western system. Other lines under construction are Humula to Tumbarumba (28.01 miles); Nimmitabel to Bombala (37.85 miles); Binnaway to Werris Creek (90.88

miles); Coonabarabran to Burren Junction (95.37 miles); Griffith to Hillston (62.18 miles); Barmedman to Rankin's Springs (70.90 miles); Yanco to Griffith (33.00 miles); Gilmore to Batlow (22.00 miles); Canowindra to Eugowra (26.70 miles); Westmead to Dural (1.50 miles); Glenreagh to Dorrigo (44.25 miles); Regent's Park to Cabramatta and Enfield (8.15 miles).

The following lines have been partly constructed, but further work is at present suspended :—Trida to Menindee (155.70 miles); Macksville to Raleigh (20.68 miles); Sydenham to Botany (6.20 miles); a total distance of 182.58 miles.

(*b*) *Victoria.* In this State the following lines were under construction by the Board of Land and Works on the 30th June, 1920 :—*5-ft. 3-in. gauge :* Beetomba to Cudgewa (9.91 miles); Cavendish to Balmoral (25.29 miles); Koo-wee-rup to McDonald's Track (30.75 miles); Manangatang to Bryden's Tank (14.25 miles); and Alberton to Won Wron (12.25 miles), making in all 92.45 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 630 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 1,250 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 Quilpie, Yaraka, Winton, and Dajarra, 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 990 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, 1920, the following lines, of an aggregate length of 590 miles, were under construction :—Southern Division—Samsonvale to Dayboro (7 miles); Goondoon to Kalliwa (31 miles); Murgon to Proston (26 miles); Cotton Vale to Soldiers' Settlement (12 miles); Oralla to Injune (33 miles). Central Division—Longreach to Winton (109 miles); Styx to St. Lawrence (19 miles); Yaraka to Powell's Creek (27 miles). Northern Division—Merinda to Bowen Coal Fields (50 miles); Tarzali to Millaa Millaa (8 miles); Mount Molloy Extension (7 miles); Koumala to St. Lawrence (58 miles); Farleigh to Proserpine (68 miles); Bambaroo to Cardwell (48 miles); Moolaba to Tully River (46 miles); Dajarra to Moonah Creek (41 miles). The following lines were under construction during the year, but work was suspended :—Kalbar to Mount Edwards (10 miles); Tara to Surat (50 miles); and Winton to 37-Mile (37 miles); a total of 97 miles.

(*d*) *South Australia.* In this State the lines under construction on the 30th June, 1920, were as follow :—Clare to Spalding (23.63 miles), and Wandana to Penong (54.00 miles), an aggregate distance of 77.63 miles.

(*e*) In *Western Australia* the following lines were in course of construction by the Public Works Department on the 30th June, 1920 :—Esperance northward (60 miles), and Narembeen to Merredin (53.25 miles), a total distance of 113.25 miles.

(*f*) *Tasmania.* At 30th June, 1920, the following lines were under construction :—Myalla to Stanley (27.14 miles); Irishtown to Smithton (5.61 miles); and Ulverstone to Ulverstone Wharf (0.62 mile); a total of 33.37 miles.

(ii) *Lines Authorised for Construction.* (*a*) *New South Wales.* At the 30th June, 1920, the following lines had been authorised for construction but not commenced :—Gilgandra to Collie (21.51 miles); Roslyn to Taralga (15.82 miles); Grafton to South Grafton with bridge over Clarence River (2.34 miles); Tarana to Oberon (16.00 miles); Rock to Pulletop (25.00 miles); Ballina to Buyong (12.50 miles); Richmond to Kurrajong (6.85 miles); a total distance of 100.02 miles.

(*b*) In *Victoria* the following lines were authorised, but their construction had not been commenced up to the end of June, 1920:—*5-ft. 3-in. gauge:* Merbein to Yelta (10 miles), and Bittern to Red Hill (10 miles), a total of 20.00 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 Quilpie to Eromanga (120 miles); Section B, from Powell's Creek (224 miles); Section C, from 37 miles to Springvale (324 miles); and Section D, from Moonah Creek (217 miles); and on the North Coast Railway, Section E, from Tully River southwards to Cardwell (24 miles). The following lines were also authorised for construction: Branch to Windera (12 miles); 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); Yarraman to Nanango (16 miles); Brooloo to Kenilworth (10 miles); Many Peaks to northern end of approved line from Mundubbera to Northern Burnett (79 miles); Monte and Rannes to open up Callide Valley and Prairie Land (110 miles); Gargett to Owens Creek (6 miles); Dobbyn to Myally Creek (50 miles); Peeramon towards Boonjee (11 miles); a total of 1,429 miles.

(*d*) In *South Australia*, Parliament has authorised the construction of lines on the 5-ft. 3-in. gauge (i) from Paringa to Renmark, a distance of 2.50 miles, and (ii) from Long Plains to Red Hill, a distance of 61 miles, and on the 3-ft. 6-in. gauge from Kielpa to Mangalo Hall (26.25 miles). The latter line, however, cannot be proceeded with except by resolution of both Houses of Parliament. The conversion of certain 3-ft. 6-in. gauge lines in the north-west of the State to 5-ft. 3-in. gauge has also been authorised. About 175 miles of line are involved in this scheme.

(*e*) In *Western Australia* the following lines were authorised for construction up to the 30th June, 1920:—Busselton-Margaret River (37.75 miles), Dwarda-Narrogin (33 miles), and Nyabing-Pingerup (21.75 miles), a distance of 92.50 miles.

(*f*) In *Tasmania* there were no lines authorised for construction which were not being proceeded with at the 30th June, 1920.

6. Cost of Construction and Equipment of State Railways.—The total cost of construction and equipment of the State railways of Australia at the 30th June, 1920, amounted to £220,020,822, or to an average cost of £10,275 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.—MILEAGE AND COST TO 30th JUNE, 1920.

State.	Length of Line Open (Route).	Total Cost of Construction and Equipment.	Average Cost per Mile Open.	Cost per Head of Population.	Mileage per 1,000 of Population.
	Miles.	£	£	£	Miles.
New South Wales (*a*) ..	5,015.32	79,318,917	15,815	39.09	2.47
Victoria	4,214.00	(*b*) 58,287,897	(*b*) 13,832	38.75	2.80
Queensland	5,685.10	40,005,868	7,037	54.27	7.71
South Australia (*a*) ..	2,333.19	(*c*) 19,105,510	(*c*) 8,188	40.44	4.94
Western Australia (*a*)..	3,538.23	18,062,354	5,105	54.05	10.59
Tasmania	628.70	5,240,276	8,344	24.19	2.90
All States ..	21,414.54	220,020,822	10,275	41.56	4.04

(*a*) Exclusive of Federal railways.
(*b*) Exclusive of cost of line from Murrayville to South Australian border (12.53 miles).
(*c*) Exclusive of cost of line from Mount Gambier to Victorian border (11.79 miles).

It will be seen that the lowest average cost per mile open, £5,105, is in Western Australia, which is slightly less than one-third of the highest average cost, namely, £15,815 in New South Wales, compared with an average of £10,275 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 relating to cost of construction and equipment do not include the discounts and flotation charges on loans allocated to the railways. This will explain the reason for the differences between the amounts shewn above for Queensland and South Australia and those shewn in the railway reports for these States.

(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 £1,750 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 many hundreds of miles of "pioneer" lines have been opened in New South Wales, the average cost ranging from about £2,000 to £7,500 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 and the Peak, the average cost of which, to the end of June, 1919, was £3,786. In Victoria also the cost of construction has been greatly reduced in recent years. The total cost to the 30th June, 1920, of the narrow gauge (2 ft. 6 in.) lines, having a length of one hundred and twenty-two miles, was only £342,142, which gives an average cost per mile of only £2,807. In the other States the cost of construction per mile has been similarly 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 of railway construction in Australia :—

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	88.50	22.55	111.05	4,133,414	37,221	1876
Sydney to Nowra	4 8½	39.90	57.79	97.69	4,467,087	45,727	1887
Homebush to Waratah ..	4 8½	95.71	..	95.71	3,559,024	37,185	1889
VICTORIA—							
Melbourne to Bendigo ..	5 3	100.89	..	100.89	4,952,521	49,088	1862
North Geelong to Ballarat ..	5 3	41.45	11.98	53.43	1,960,540	36,694	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 £41,573, whereas the average cost of the 351.24 miles referred to in the next table was £1,916.

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.
	ft. in.	Miles.	£	£	
NEW SOUTH WALES—					
Parkes to Condobolin ..	4 8½	62.75	132,917	2,118	1898
Burren Junction to Pokataroo ..	4 8½	42.55	104,509	2,455	1906
VICTORIA—					
Wangaratta to Whitfield ..	2 6	30.49	40,135	1,316	1899
Wycheproof to Sea Lake ..	5 3	47.89	85,532	1,786	1895
Ultima to Chillingollah ..	5 3	20.14	34,402	1,708	1909
QUEENSLAND—					
Dalby to Bell	3 6	23.50	38,567	1,641	1906
Mahar to Jandowae	3 6	28.24	61,307	2,171	1914
SOUTH AUSTRALIA—					
Wandilo to Glencoe	3 6	9.13	11,740	1,287	1904
Tailem Bend to Pinnaroo ..	5 3	86.55	164,027	1,895	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.*, exclusive of cost of equipment), and cannot therefore be directly compared with the average cost per mile open given in the table on page 584.

(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 each year from 1916 to 1920 is shewn in the following table :—

STATE RAILWAYS.—CAPITAL COST OF CONSTRUCTION AND EQUIPMENT, 1916 TO 1920.

Year ended 30th June.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	All States.
	TOTAL COST OF LINES OPEN.						
	£	£	£	£	£	£	£
1916 ..	68,825,592	54,428,148	34,787,623	17,236,543	17,118,195	4,798,646	197,194,747
1917 ..	72,006,621	55,652,275	36,476,000	17,687,344	17,466,802	4,913,395	204,202,437
1918 ..	75,050,450	*a*56,535,414	37,301,889	*b*17,974,348	17,760,566	4,979,399	(*a*, *b*)209,602,066
1919 ..	76,601,591	*a*57,403,576	38,244,494	*b*18,649,979	17,995,941	5,076,014	(*a*, *b*)213,971,595
1920 ..	79,318,917	*a*58,287,897	40,005,868	*b*19,105,510	18,062,354	5,240,276	(*a*, *b*)220,020,822
	COST PER MILE OPEN.						
1916 ..	16,434	13,275	7,004	7,881	5,138	8,534	10,198
1917 ..	16,229	13,498	6,996	7,964	5,100	8,447	10,210
1918 ..	16,042	(*a*)13,659	7,045	(*b*) 8,058	5,087	8,470	(*a*, *b*)10,263
1919 ..	15,877	(*a*)13,743	6,992	(*b*) 8,186	5,086	8,438	(*a*, *b*)10,243
1920 ..	15,815	(*a*)13,832	7,037	(*b*) 8,188	5,105	8,344	(*a*, *b*)10,275

(*a*) Exclusive of cost of line from Murrayville to South Australian border (12.53 miles).
(*b*) Exclusive of cost of line from Mount Gambier to Victorian border (11.79 miles).

(iii) *Loan Expenditure on Railways.* The subjoined table shews the total loan expenditure on Government railways (including lines both open and unopen) in each State, except Tasmania, and on Government railways and tramways in the latter State for the years 1915–16 to 1919–20 :—

STATE RAILWAYS.—LOAN EXPENDITURE, 1916 TO 1920.

Year ended 30th June.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas. (a)	All States.
	£	£	£	£	£	£	£
1916 ..	4,787,669	2,440,317	2,034,614	929,143	414,026	233,601	10,839,370
1917 ..	3,706,422	1,266,352	1,342,249	413,095	308,027	133,056	7,169,201
1918 ..	2,294,547	761,705	984,147	500,441	181,394	55,561	4,777,795
1919 ..	1,441,105	878,384	1,416,302	324,041	154,720	39,165	4,253,717
1920 ..	2,436,991	1,283,210	2,356,498	236,925	78,901	91,221	6,483,746

(a) Including tramways.

The following statement shews the total loan expenditure on railways to the 30th June, 1920 :—

STATE RAILWAYS.—TOTAL LOAN EXPENDITURE IN EACH STATE TO 30th JUNE, 1920.

State ..	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.a	All States.
	£	£	£	£	£	£	£
Expenditure	83,814,832	56,806,206	42,211,195	21,199,834	17,412,211	5,596,986	227,041,354

(a) 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 each financial year from 1916 to 1920 inclusive :—

STATE RAILWAYS.—GROSS REVENUE, TOTAL, PER AVERAGE MILE WORKED, AND PER TRAIN-MILE RUN, 1916 TO 1920.

Year ended 30th June.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	All States.
Total Gross Revenue.							
	£	£	£	£	£	£	£
1916	8,006,078	5,705,163	3,745,350	1,965,410	2,088,110	348,028	21,858,139
1917	8,380,084	5,952,719	3,831,967	2,273,530	1,877,382	340,505	22,656,187
1918	8,954,880	6,562,259	4,023,921	2,331,549	1,816,388	356,735	24,045,732
1919	9,958,173	6,432,277	3,984,597	2,391,409	1,872,897	401,364	25,040,717
1920	13,083,847	8,224,972	4,960,150	2,726,540	2,291,876	506,177	31,793,562
Gross Revenue per Average Mile Worked.							
	£	£	£	£	£	£	£
1916	1,920	1,443	758	899	627	630	1,142
1917	1,943	1,450	756	1,037	557	591	1,155
1918	1,968	1,585	762	1,043	525	604	1,166
1919	2,102	1,547	748	1,047	534	670	1,215
1920	2,635	1,961	880	1,177	648	797	1,494
Gross Revenue per Train-mile Run.							
	d.	d.	d.	d.	d.	d.	d.
1916	89.14	99.03	77.68	83.77	97.32	79.43	89.24
1917	99.07	101.89	85.72	95.22	100.12	75.64	96.47
1918	118.46	115.58	93.58	102.85	106.47	81.05	109.55
1919	119.88	118.46	96.18	106.03	105.60	86.95	111.94
1920	137.51	131.40	113.99	126.03	113.38	95.91	127.50

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 1916 to 1920, 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, 1916 TO 1920.

Year ended 30th June.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	All States.
	£	£	£	£	£	£	£
Coaching Traffic Receipts.							
1916 ..	3,574,063	3,003,263	1,339,753	721,555	646,566	179,784	9,464,984
1917 ..	3,637,656	2,918,557	1,308,896	739,483	607,537	171,220	9,383,349
1918 ..	3,932,936	3,254,274	1,396,803	819,197	617,606	177,854	10,198,670
1919 ..	3,978,180	3,241,194	1,392,476	807,747	637,851	188,329	10,245,777
1920 ..	5,714,131	4,205,420	1,833,349	1,130,659	764,872	236,763	13,885,194
Goods and Live Stock Traffic Receipts.							
1916 ..	4,329,971	2,610,210	2,364,364	1,211,465	1,356,452	156,860	12,029,322
1917 ..	4,542,619	2,934,259	2,433,868	1,502,363	1,176,058	158,162	12,747,329
1918 ..	4,652,113	3,137,547	2,516,564	1,480,469	1,105,836	168,095	13,060,624
1919 ..	5,583,982	2,957,789	2,483,698	1,536,209	1,127,539	203,412	13,892,629
1920 ..	6,807,792	3,721,122	3,000,829	1,556,224	1,394,908	261,657	16,742,532
Miscellaneous Receipts.							
1916 ..	102,044	91,690	41,233	32,390	85,092	11,384	363,833
1917 ..	(*a*)199,809	99,903	89,203	31,684	93,787	11,123	525,509
1918 ..	(*a*)369,831	170,438	110,554	31,883	92,946	10,786	786,438
1919 ..	(*a*)396,011	233,294	108,423	47,453	107,507	9,623	902,311
1920 ..	(*a*)561,924	(*b*)298,430	125,972	39,657	132,096	7,757	1,165,836

(*a*) Including Refreshment Rooms, 1917, £102,375; 1918, £274,699; 1919, £289,810; and 1920, £426,323. (*b*) Including Refreshment Rooms, 1920, £105,619.

(i) *New South Wales.* The total earnings for the year 1919–20 amounted to £13,083,847, an increase of £3,125,674 as compared with the previous year. Increases of £1,735,951, £1,223,810, and £165,913 took place in the coaching traffic, goods and live stock traffic, and miscellaneous respectively.

(ii) *Victoria.* In Victoria, traffic receipts shewed increases as compared with previous year of £964,226, £763,333, and £65,136 in coaching traffic, goods and live stock traffic, and miscellaneous respectively.

(iii) *Queensland.* In Queensland, there were increases in 1919–20 of £440,873, £517,131, and £17,549 in respect of coaching traffic, goods and live stock traffic, and miscellaneous respectively.

(iv) *South Australia.* In this State there were increases of £322,912 and £20,015 in coaching traffic and goods and live stock receipts respectively, and a decrease of £7,796 in miscellaneous receipts, the net increase for the year 1919–20 being £335,131 in advance of the receipts for the previous year.

(v) *Western Australia.* In this State the earnings in 1919–20 shewed an increase of £418,979 as compared with 1918–19. There were increases of £127,021, £267,369, and £24,589 in the coaching traffic, goods and live stock traffic, and miscellaneous receipts respectively.

(vi) *Tasmania.* The gross revenue in 1919-20 shewed an increase of £104,813 as compared with the previous year. In the coaching traffic and goods and live stock traffic receipts there were increases of £48,434 and £58,245 respectively, and a decrease of £1,866 in the miscellaneous receipts.

The following table shews for the two years 1918-19 and 1919-20 the percentage which each class of receipts bears to the total gross revenue :—

STATE RAILWAYS.—PERCENTAGE OF REVENUES FROM VARIOUS SOURCES ON TOTAL REVENUE, 1919 and 1920.

Particulars.	1918–19.						
	N.S.W.	Vic.	Q'land.	S. Aust.	W. Aust.	Tas.	All States.
	%	%	%	%	%	%	%
Coaching	39.95	50.39	34.95	33.78	34.06	46.92	40.92
Goods and live stock ..	56.07	45.98	62.33	64.24	60.20	50.68	55.48
Miscellaneous	3.98	3.63	2.72	1.98	5.74	2.40	3.60

Particulars.	1919–20.						
	N.S.W.	Vic.	Q'land.	S. Aust.	W. Aust.	Tas.	All States.
	%	%	%	%	%	%	%
Coaching	43.67	51.13	36.96	41.46	33.38	46.78	43.67
Goods and live stock ..	52.03	45.24	60.50	57.08	60.86	51.68	52.66
Miscellaneous	4.30	3.63	2.54	1.46	5.76	1.54	3.67

9. **Coaching Traffic Receipts per Average Mile Worked, and per Passenger-train Mile.**—The subjoined table shews the receipts from coaching traffic per average mile of line worked, and per passenger-train mile, in each State and for all States for the year ended the 30th June, 1920 :—

STATE RAILWAYS.—COACHING TRAFFIC RECEIPTS PER MILE WORKED, AND PER PASSENGER-TRAIN MILE, 1919–20.

State.	Number of Passenger-Train Miles.(a)	Coaching Traffic Receipts.		
		Gross.	Per Average Mile Worked.	Per Passenger-Train Mile.
	No.	£	£	*d.*
New South Wales	11,136,399	5,714,131	1,150	123.14
Victoria	7,946,315	4,205,420	1,003	127.01
Queensland	3,588,375	1,833,349	325	122.61
South Australia	2,576,017	1,130,659	488	104.11
Western Australia	1,978,379	764,872	216	92.78
Tasmania	472,158	236,763	372	120.34
Total	27,697,643	13,885,194	652	120.31

(a) 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 ..	1,615,909	Western Australia ..	1,026,294
Victoria	2,528,802	Tasmania	709,830

The preceding table shews that, amongst the States, there is a considerable difference in the amount of the average receipts per average mile worked. In this respect New South Wales shews the maximum of £1,150, while Western Australia has a minimum of £216, the average for all States being £652. In the case of the receipts per passenger-train mile the maximum occurs in Victoria with 127.01 pence, and the minimum in Western Australia, 92.78 pence, the average for all States being 120.31 pence.

With regard to the number of passenger journeys in the various States, it will be seen from the table on page 581 *ante* that there has been a preponderance in favour of Victoria for years past, though it was a declining one during the years 1915 to 1918. In the year 1919–20, however, there was an increase over the two previous years.

This preponderance 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 in 1919–20, 123,748,299 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 104,311,991. 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 1919–20 being 269,255,935. In Melbourne, on the other hand, the number of passengers carried on the two cable tramway systems during the same period was 135,817,199; and the number carried on the St. Kilda-Brighton, Sandringham-Black Rock, Prahran-Malvern, Melbourne-Brunswick-Coburg, Hawthorn, and the North Melbourne tramways, 66,546,841, making a total of 202,364,040. This matter is referred to hereinafter. (See sub-section 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, 1920 :—

STATE RAILWAYS.—GOODS AND LIVE-STOCK TRAFFIC RECEIPTS PER MILE WORKED, PER GOODS-TRAIN MILE, AND PER TON CARRIED, 1919–20.

State.	Number of Goods-Train Miles. (a)	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 ..	11,698,490	13,293,528	6,807,792	1,371	139.66	122.91
Victoria	7,076,150	7,770,694	3,721,122	887	126.21	114.92
Queensland ..	6,855,244	3,790,881	3,000,829	533	147.65	189.98
South Australia ..	2,616,021	2,578,908	1,556,224	672	142.77	144.81
Western Australia ..	2,873,067	2,613,606	1,394,908	394	116.52	128.09
Tasmania	794,467	575,169	261,657	412	79.04	109.18
Total ..	31,913,439	30,622,786	16,742,532	787	120.65	131.22

(a) 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 ..	1,615,909	Western Australia ..	1,026,294
Victoria	2,528,802	Tasmania	709,830

From the preceding table it will be seen that the average cost of freight per ton ranges from 109.18 pence in Tasmania to 189.98 pence in Queensland, the average for all States being 131.22 pence.

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 the percentage of the total of these expenses upon the corresponding gross revenues in each State for each year 1916 to 1920 :—

STATE RAILWAYS.—TOTAL WORKING EXPENSES, AND PERCENTAGE OF WORKING EXPENSES ON GROSS REVENUE, 1916 TO 1920.

Year ended 30th June.	N.S.W.	Victoria. (*a*)	Q'land.	S. Aust.	W. Aust.	Tasmania.	All States.
TOTAL WORKING EXPENSES.							
	£	£	£	£	£	£	£
1916	5,661,168	3,997,412	2,745,061	1,545,489	1,511,655	248,651	15,709,436
1917	5,915,360	4,154,040	2,994,187	1,725,341	1,448,451	289,186	16,526,565
1918	5,940,447	4,451,092	3,410,157	1,747,055	1,451,334	277,952	17,278,037
1919	6,904,450	4,279,663	3,690,445	1,829,634	1,567,591	324,595	18,596,378
1920	9,570,983	6,058,912	4,323,392	2,007,361	2,009,473	390,191	24,351,312
PERCENTAGE OF WORKING EXPENSES ON GROSS REVENUE.							
	%	%	%	%	%	%	%
1916	70.71	70.07	73.29	78.63	72.39	71.45	71.87
1917	70.59	69.78	78.14	76.89	77.15	84.93	72.95
1918	66.34	67.83	84.75	74.93	79.90	77.92	71.85
1919	69.33	66.53	92.62	76.51	83.70	80.87	74.26
1920	73.15	73.66	87.16	73.62	87.29	77.08	76.59

(*a*) Including amounts paid for special and abnormal charges.

(i) *New South Wales.* In this State the total working expenses in 1919-20 amounted to £9,570,983, an increase of £2,666,533 as compared with the previous year. Part of this amount is due to the increase of 14.54 per cent. in the train mileage over that of the previous year (2,899,687 miles). There were several increases of wages to the staff under awards of the Court of Industrial Arbitration and also large increases in the prices paid for coal and other materials, all of which accounted for a sum of £1,427,446.

(ii) *Victoria.* In Victoria there was an increase of £1,779,249 in working expenses. This was partly due to increases in wages made by the Railway Classification Board, repayment to capital account in respect of sidings provided for the Victorian Wheat Commission and increased prices paid for coal, all of which accounted for a sum of £883,276.

(iii) *Queensland.* In this State the working expenses increased by £632,947, from £3,690,445 in 1918–19 to £4,323,392 in 1919–20. There were substantial increases to staff due to a new award (£290,861) and automatic increases (£32,500), as well as increases in the cost of fuel and other materials; but the main factor was the cost of working the Locomotive Branch, which was responsible for £350,638, or 55 per cent. of the total. The sum of £180,084 represented the excess over last year of repairs and renewals (including wages) to engines, carriages, and wagons. These repairs were long overdue, and had conditions been normal this expenditure would have been spread over a number of years commencing shortly after the outbreak of war.

(iv) *South Australia.* In South Australia the working expenses in 1919–20 shewed an increase of £177,727 over 1918–19, viz., from £1,829,634 to £2,007,361. This increase was due to the higher prices of stores used in maintenance, and for traffic purposes (£70,000), together with increased payment for wages under the Government Workers Tribunal award and the general application of the minimum wage.

(v) *Western Australia.* In this case the expenditure in 1919–20 was £432,882 greater than in the previous year. The train mileage run was 594,819 more than in the previous year, and the locomotive and rolling stock charges, maintenance, and traffic expenses were greater, mainly owing to the higher cost of stores.

(vi) *Tasmania.* In 1919–20 the working expenses were £65,596 higher than in the previous year. This was mainly owing to the increased salaries and wages paid, higher cost of material of all descriptions, and increase in train mileage of 158,735.

In the preceding table it will be observed that the percentages of the total working expenses to the total gross earnings of the State railways have varied but slightly during the period 1915 to 1920, the last year shewing the maximum rate, 76.59 per cent.

(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 1916 to 1920 :—

STATE RAILWAYS.—WORKING EXPENSES PER AVERAGE MILE WORKED AND PER TRAIN-MILE RUN, 1916 TO 1920.

Year ended 30th June.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	All States.
WORKING EXPENSES PER AVERAGE MILE WORKED.							
	£	£	£	£	£	£	£
1916	1,358	1,011	556	707	454	450	821
1917	1,372	1,012	591	787	430	502	842
1918	1,305	1,075	646	782	419	470	838
1919	1,457	1,029	693	801	447	542	902
1920	1,927	1,445	767	867	565	614	1,144
WORKING EXPENSES PER TRAIN-MILE RUN.							
	d.	d.	d.	d.	d.	d.	d.
1916	63.03	69.39	56.93	65.87	70.45	56.75	64.14
1917	69.93	71.10	66.98	72.26	77.25	64.24	70.37
1918	78.58	78.40	79.31	77.07	85.07	63.15	78.72
1919	83.12	78.82	89.08	81.12	88.39	70.32	83.13
1920	100.59	96.80	99.35	92.79	98.96	73.93	98.04

12. **Distribution of Working Expenses.**—The subjoined table shews the distribution of working expenses, among four chief heads of expenditure, for the years 1916 to 1920 :—

STATE RAILWAYS.—DISTRIBUTION OF WORKING EXPENSES, 1916 TO 1920.

Year ended 30th June.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	All States.
MAINTENANCE.							
	£	£	£	£	£	£	£
1916	895,526	993,619	738,160	306,420	361,627	66,618	3,366,970
1917	932,990	927,315	774,833	391,334	349,714	82,571	3,458,757
1918	996,502	1,049,270	851,525	304,462	371,411	72,515	3,645,685
1919	1,126,118	870,123	904,199	338,785	411,986	87,902	3,739,113
1920	1,589,472	1,288,030	988,881	350,953	485,647	100,276	4,803,259
LOCOMOTIVE, CARRIAGE, AND WAGON CHARGES.							
1916	2,917,299	1,747,319	1,198,160	859,334	714,802	108,887	7,545,801
1917	2,926,231	1,953,262	1,326,902	909,660	681,243	125,889	7,923,187
1918	2.755,183	2.042,846	1,515,121	982,298	656,576	125,190	8,077,214
1919	3,277,623	2,019,967	1,650,263	981,646	689,333	149,260	8,768,092
1920	4,603,775	2,785,614	2,000,901	1,101,629	927,139	185,576	11,604,634
TRAFFIC EXPENSES.							
1916	1,638,942	1,127,568	744,229	350,472	393,033	58,571	4,312,815
1917	1,763,466	1,137,703	821,941	391,309	375,655	64,247	4,554,321
1918	1,727,861	1,225,479	974,513	426,775	379,991	63,728	4,798,347
1919	1,927,612	1,257,685	1,067,667	459,147	418,050	72,514	5,202,675
1920	2,535,813	1,820,588	1,251,192	495,700	529,802	87,786	6,720,881
OTHER CHARGES.							
1916	209,401	123,906	64,512	29,263	42,193	14,575	483,850
1917	(*a*)292,673	135,760	70,511	33,038	41,839	16,479	590,300
1918	(*a*)460,901	133,497	68,998	33,520	43,356	16,519	756,791
1919	(*a*)573,097	131,888	68,316	50,056	48,222	14,919	886,498
1920	(*a*)841,923	(*b*)164,680	82,418	59,079	57,885	16,553	1,222,538

(*a*) Including Refreshment Rooms, 1917, £94,914; 1918, £236,063; 1919, £248,249; and 1920, £352,616. (*b*) Including Refreshment Rooms, £78,840.

13. **Net Revenue.**—The following table shews the net sums available to meet interest charges, 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 1916 to 1920 :—

STATE RAILWAYS.—NET REVENUE AND PERCENTAGE OF NET REVENUE ON CAPITAL COST OF LINES OPEN, 1916 TO 1920.

Year ended 30th June.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	All States.
NET REVENUE.							
	£	£	£	£	£	£	£
1916	2,344,910	1,707,751	1,000,289	419,921	576,455	99,377	6,148,703
1917	2,464,724	1,798,679	837,780	548,189	428,931	51,319	6,129,622
1918	3,014,433	2,111,167	613,764	584,494	365,054	78,783	6,767,695
1919	3,053,723	2,152,614	294,152	561,775	305,306	76,769	6,444,339
1920	3,512,863	2,166,060	636,758	719,180	291,403	115,986	7,442,250
PERCENTAGE OF NET REVENUE ON CAPITAL EXPENDITURE.							
	%	%	%	%	%	%	%
1916	3.41	3.14	2.88	2.44	3.27	2.07	3.12
1917	3.42	3.23	2.30	3.10	2.46	1.04	3.00
1918	4.02	3.73	1.65	3.25	2.06	1.58	3.23
1919	3.99	3.75	0.77	3.01	1.70	1.51	3.01
1920	4.43	3.72	1.59	3.76	1.61	2.21	3.38

(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 table:—

STATE RAILWAYS.—NET REVENUE PER AVERAGE MILE WORKED AND PER TRAIN-MILE RUN, 1916 TO 1920.

Year ended 30th June.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	All States.
NET REVENUE PER AVERAGE MILE WORKED.							
	£	£	£	£	£	£	£
1916	562	432	202	192	173	180	321
1917	571	438	165	250	127	89	312
1918	663	510	116	261	105	133	328
1919	645	518	55	246	87	128	313
1920	708	516	113	311	82	183	350
NET REVENUE PER TRAIN-MILE RUN.							
	d.	*d.*	*d.*	*d.*	*d.*	*d.*	*d.*
1916	26.11	29.64	20.75	17.90	26.87	22.68	25.10
1917	29.14	30.79	18.74	22.96	22.87	11.40	26.10
1918	39.88	37.18	14.27	25.78	21.40	17.90	30.83
1919	36.76	39.64	7.10	24.91	17.21	16.63	28.81
1920	36.92	34.61	14.63	33.24	14.42	21.97	29.96

14. **Traffic Conditions.**—Reference has already been made to the difference in the traffic conditions on many of the lines of the Commonwealth (see sub-sections 9, 10, and 11 hereof). These conditions differ not only in the several States, but also on different lines in the same State, and apply 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; and 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 per 100 of mean population and per average mile worked in each State during the financial year 1919–20:—

STATE RAILWAYS.—PASSENGER JOURNEYS AND TONNAGE OF GOODS AND LIVE STOCK, 1919–20.

Particulars.		N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	All States.
PER 100 OF MEAN POPULATION.								
Passenger journeys ..	No.	5,651	8,907	3,837	4,835	5,512	1,042	6,054
Goods and live stock	Tons	655	516	516	546	782	264	579
PER AVERAGE MILE OF LINE WORKED.								
Passenger journeys ..	No.	23,087	31,953	5,003	9,867	5,203	3,570	15,052
Goods and live stock	Tons	2,676	1,852	672	1,113	738	905	1,438

Particulars of the actual numbers of passengers and tons of goods and live stock carried have already been given (see sub-section 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 shews the number of metropolitan and country passengers carried in each of the States mentioned and the revenue derived therefrom during the year 1919-20 :—

STATE RAILWAYS.—METROPOLITAN, SUBURBAN, AND COUNTRY PASSENGER TRAFFIC, 1919-20.

Particulars.	Number of Passenger Journeys.			Revenue.		
	Metropolitan.	Country.	Total.	Metropolitan.	Country.	Total.
				£	£	£
N.S.W. ..	a104,311,991	10,342,669	114,654,660	1,690,621	3,446,626	5,137,247
Victoria ..	b123,748,299	10,263,863	134,012,162	1,584,363	2,195,888	3,780,251

(a) Within 34 miles of Sydney and Newcastle, including the Richmond line.
(b) Within 20 miles of Melbourne.

From this table it will be seen that the number of passenger journeys in country districts in Victoria was less than the corresponding number in New South Wales, while the number of metropolitan passenger journeys in Victoria was 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. The Sydney ferries also carry a large number of suburban passengers (see § 3. Tramways).

In previous issues of this work reference has been made to the scheme for the electrification of the suburban lines running out of Melbourne. Part of this scheme was brought into operation on the lines between Sandringham and Essendon, via Melbourne, on the 28th May, 1919, followed by the St. Kilda line on the 31st August, and the Port Melbourne line on the 26th October. It may be mentioned that the Melbourne suburban lines have a total length of 195.78 route miles, of which approximately 42 miles have been electrified. In Sydney, a Metropolitan Railway Construction Branch of the Railway Department has been created to deal specially with electrical transport in the city area. The Minister has approved of the construction of an underground city railway, and plans have been prepared and a commencement made with the preliminary works. The preliminary work in the location of a system of electric railways for the eastern, western, and northern suburbs has also been in hand, and good progress has been made with the remodelling of the tracks and the alteration to platform walls and lifting of floors of station buildings on the section between Sydney and Loftus.

The following lines have been converted and opened for traffic on dates as shewn, viz. :—Williamstown, 29th August, 1920 ; Coburg, 2nd December, 1920 ; Reservoir, 15th June, 1921 ; Heidelberg, 31st July, 1921 ; and the Essendon line extended to Broadmeadows on 4th September, 1921. It is expected that the lines to Dandenong and Frankston will be opened in 1922, whilst the Ringwood line and branches should be converted about the middle of 1923, when the scheme will be complete.

(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 connexion 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 1919–20 :—

STATE RAILWAYS.—CLASSIFICATION OF COMMODITIES CARRIED, 1919–20.

State.	Minerals.	Fire-wood.	Grain and Flour.	Hay, Straw, and Chaff.	Wool.	Live Stock.	All other Commodities.	Total.
TONS CARRIED.								
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
New South Wales	a7,594,711	195,405	c764,457	564,461	117,171	900,933	2,873,026	a13,010,164
Victoria ..	b1,327,556	662,338	1,879,361	421,217	88,719	697,537	2,693,966	7,770,694
Queensland ..	1,168,727	249,919	d48,017	f231,565	61,253	416,076	1,615,324	3,790,881
South Australia	414,285	214,207	754,040	137,585	45,365	154,697	858,729	2,578,908
Western Australia	497,146	429,011	696,004	114,677	33,089	97,635	746,044	2,613,606
Tasmania ..	145,215	63,260	e	50,218	5,886	22,337	288,253	575,169
All States ..	11,147,640	1,814,140	4,141,879	1,519,723	351,483	2,289,215	9,075,342	30,339,422
PERCENTAGE ON TOTAL TONNAGE CARRIED.								
	%	%	%	%	%	%	%	%
New South Wales	58.38	1.50	5.88	4.34	0.90	6.92	22.08	100.00
Victoria ..	17.08	8.52	24.19	5.42	1.14	8.98	34.67	100.00
Queensland ..	30.83	6.59	1.27	6.12	1.61	10.97	42.61	100.00
South Australia	16.06	8.31	29.24	5.33	1.76	6.00	33.30	100.00
Western Australia	19.02	16.41	26.63	4.39	1.27	3.74	28.54	100.00
Tasmania ..	25.25	11.00	e	8.73	1.02	3.88	50.12	100.00
All States ..	36.74	5.98	13.65	5.01	1.16	7.54	29.92	100.00

(a) Exclusive of 283,364 tons of coal on which only shunting and haulage were collected. (b) Coal, stone, gravel, and sand. (c) Up journey only (to coast). (d) Flour only. (e) Included in all other commodities. (f) Sugar-cane.

15. Passenger-Mileage and Ton-Mileage.—In earlier issues of the Year Book reference has been made to the resolution on the subject of passenger-mileage and ton-mileage statistics passed at the Interstate Conference of Railway Commissioners held in Melbourne in May, 1909; and to the Report [Cd. 4697] on the same subject by a Committee appointed by the President of the Board of Trade in the United Kingdom (see Year Book No. 10, p. 654).

In the Commonwealth, information regarding "passenger-miles" and "ton-miles" is available, either wholly or in part, for four of the States only, viz., New South Wales, South Australia, Western Australia, and Tasmania, but is not available at all for either Victoria or Queensland. Of the 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 of goods together, and Tasmania supplies particulars for all classes of passengers together and a classification of nature of commodities carried. Western Australia furnished particulars as to ton-miles for the years 1907 to 1912, but no records were furnished for the period 1913 to 1917.

(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 available for suburban and extended suburban traffic only—*i.e.*, for 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" is obtained by dividing the number of "passenger-miles" by the number of "passenger-train-miles." Similarly, the "density of traffic" is obtained by dividing the number of "passenger-miles" by the "average miles worked."

STATE RAILWAYS.—SUMMARY OF "PASSENGER-MILES," 1916 TO 1920.

Year ended 30th June—	Passenger Train Mileage.	Number of Passenger Journeys.	Total Passenger-miles.	Amount Received from Passengers.	Average Number of Passengers carried per Train.	Average Mileage per Passenger-journey.	Average Receipt per Passenger-mile.	Average Fare per Passenger-journey.	Density of Traffic per Average Mile Worked.
	Miles. (,000 omitted.)	No. (,000 omitted.)	No. (,000 omitted.)	£	No.	Miles.	d.	d.	No.
NEW SOUTH WALES.									
1916	10,283	92,851	1,321,491	3,147,041	129	12.85	0.57	8.13	316,980
1917	10,435	96,710	1,473,707	3,202,167	141	15.24	0.52	7.95	341,690
1918	9,441	94,305	1,384,766	3,473,340	147	14.67	0.60	8.84	304,277
1919	9,689	98,569	1,367,691	3,533,869	141	13.88	0.62	8.60	288,725
1920	11,136	114,655	1,632,627	5,137,247	147	14.24	0.74	10.75	328,761
SOUTH AUSTRALIA.									
1916	2,786	20,513	218,609	603,203	78	10.66	0.66	7.06	100,050
1917	2,635	18,107	210,303	615,909	80	11.61	0.70	8.16	95,897
1918	2,597	18,936	234,197	703,221	90	12.37	0.72	8.91	104,786
1919	2,644	20,177	238,845	703,748	90	11.84	0.71	8.37	104,527
1920	2,576	22,852	305,834	979,596	119	13.38	0.77	10.29	132,052
TASMANIA.									
1916	465	2,078	46,719	154,225	100	22.48	0.79	17.81	84,567
1917	471	1,972	40,164	145,941	85	20.37	0.87	17.76	69,607
1918	448	1,874	40,385	151,874	90	21.55	0.90	19.45	68,324
1919	448	1,889	39,961	167,035	89	21.15	1.00	21.22	67,713
1920	472	2,268	46,015	209,866	97	20.29	1.09	22.21	72,465

(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, and for the years 1919 and 1920, but not for the intervening years. 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 terminals are included.

STATE RAILWAYS.—SUMMARY OF "TON-MILES," 1916 TO 1920.

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. (*a*)								
1916	11,273	11,614	1,028,760	3,738,227	91.26	88.58	0.87	246,764
1917	9,866	11,468	1,136,485	3,936,639	115.19	99.10	0.83	263,502
1918	8,703	11,094	1,044,437	4,051,655	120.02	94.14	0.93	229,496
1919	10,246	12,469	1,237,806	4,889,343	120.80	99.27	0.95	261,306
1920	11,698	13,010	1,394,099	6,106,563	119.17	107.15	1.05	280,729
SOUTH AUSTRALIA.								
1916	2,845	2,397	278,942	1,211,465	98.04	116.37	1.04	127,662
1917	3,095	2,822	298,442	1,502,363	96.41	105.74	1.21	136,089
1918	2,844	2,768	270,104	1,480,469	94.99	97.59	1.32	120,852
1919	2,769	2,619	263,984	1,536,209	95.33	100.81	1.40	115,529
1920	2,616	2,579	196,534	1,556,224	75.13	76.21	1.90	84,859
WESTERN AUSTRALIA.								
1907	1,940	2,091	144,856	964,653	74.67	69.26	1.60	86,429
1912	2,747	2,542	184,748	1,154,087	67.25	72.67	1.49	77,767
1919	2,485	2,379	173,283	1,127,539	69.73	72.83	1.56	49,411
1920	2,873	2,614	207,384	1,394,908	72.18	79.34	1.61	58,616
TASMANIA. (*b*)								
1916	586	367	20,105	145,094	34.29	54.81	1.73	36,392
1917	609	380	21,288	146,248	34.93	55.98	1.65	36,894
1918	609	389	21,539	153,577	35.39	55.42	1.71	36,444
1919	660	456	23,745	190,524	35.97	52.12	1.93	39,641
1920	794	575	30,967	234,147	38.99	56.01	1.81	48,767

(*a*) Exclusive of tonnage on which only shunting and haulage charges are collected.
(*b*) Exclusive of live stock.

(iii) *Classification of Commodity Ton-mileage.* As previously mentioned, 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 283,364 tons of coal on which only shunting and haulage charges were collected, nor does it include £117,158 for haulage, tonnage dues, etc.

NEW SOUTH WALES.—SUMMARY OF TON-MILEAGE FOR THE YEAR ENDED 30th JUNE, 1920.

Particulars.	Total Tons Carried.	Total "Ton-miles."	Average Miles per Ton.	Earnings (exclusive of Terminals).	Earnings per "Ton-mile."	Per cent. on Total Tonnage.
	No.	No.	No.	£	d.	%
Coal, coke, and shale	6,504,641	353,074,118	54.28	897,251	0.61	50.00
Other minerals ..	938,574	59,820,157	63.74	149,596	0.60	7.21
Crude ores	151,496	19,943,250	131.64	53,655	0.64	1.16
Miscellaneous ..	1,086,816	131,998,296	121.45	476,977	0.87	8.35
Firewood	195,405	6,205,071	31.75	32,499	1.26	1.50
Fruit	126,900	26,119,289	205.83	123,488	1.13	0.98
Grain, flour, etc. (Up journey to coast) ..	764,457	158,676,661	207.57	348,540	0.53	5.88
Hay, straw, and chaff	564,461	181,230,680	321.07	340,506	0.45	4.34
Frozen meat ..	22,180	1,980,281	89.28	11,113	1.35	0.17
A class	750,834	96,351,640	128.33	531,504	1.32	5.77
B class	322,343	34,100,721	105.79	288,769	2.03	2.48
C class	50,421	4,433,462	87.93	59,191	3.20	0.39
1st class	247,162	18,489,915	74.81	270,963	3.52	1.90
2nd class	266,370	46,261,339	173.67	885,186	4.59	2.05
Wool	117,171	34,196,799	291.85	341,853	2.40	0.90
Live stock	900,933	221,217,452	245.54	1,295,472	1.41	6.92
Total ..	13,010,164	1,394,099,131	107.15	6,106,563	1.05	100.00

In the following tables will be found particulars of the ton-mileage and earnings per ton-mile in the case of Western Australia and Tasmania :—

WESTERN AUSTRALIA.—SUMMARY OF TON-MILEAGE FOR THE YEAR ENDED 30th JUNE, 1920.

Particulars.	Total Tons Carried.	Total "Ton-miles."	Average Miles per Ton.	Earnings.	Earnings per "Ton-mile."	Per cent. on Total Tonnage.
		No.	No.	£	d.	%
Native coal, coke, shale and charcoal ..	188,164	22,138,557	117.65	63,527	0.69	7.20
Imported coal, coke, shale and charcoal ..	27,615	1,104,204	39.98	7,268	1.58	1.06
Wool	33,089	2,250,047	68.00	47,475	5.06	1.27
Hay, straw and chaff ..	114,677	13,306,347	116.03	68,773	1.24	4.39
Wheat	467,009	39,197,348	83.93	173,055	1.06	17.87
Firewood	429,011	6,814,630	15.88	40,924	1.44	16.41
Native timber ..	349,076	25,367,971	72.67	167,432	1.58	13.36
Imported timber ..	2,325	48,359	20.80	1,103	5.47	0.09
Fruit and garden produce	50,153	7,543,812	150.42	52,358	1.67	1.92
Fertilizers	79,457	11,178,336	140.68	19,709	0.42	3.04
Water	7,909	245,679	31.06	1,495	1.46	0.30
Miscellaneous (including ores and minerals) ..	281,367	11,674,379	41.49	58,699	1.21	10.76
Grain and special grain class (other than wheat, chaff, &c.)	228,995	18,953,671	82.77	99,481	1.26	8.76
A class	26,889	2,700,306	100.42	18,092	1.61	1.03
B class	32,420	9,927,140	306.20	64,222	1.55	1.24
C class	13,453	2,810,038	208.88	35,185	3.01	0.52
1st class	60,132	7,071,724	117.60	144,584	4.91	2.30
2nd class	24,155	2,889,190	119.61	77,989	6.48	0.92
3rd class	15,282	2,621,698	171.55	81,365	7.45	0.58
All other goods paying ..	84,793	6,943,168	81.88	62,677	2.17	3.24
Live stock	97,635	12,597,497	129.03	109,495	2.09	3.74
Total	2,613,606	207,384,101	79.35	1,394,908	1.61	100.00

TASMANIA.—SUMMARY OF TON-MILEAGE FOR THE YEAR ENDED 30th JUNE, 1920.

Particulars.	Total Tons Carried.	Total "Ton-miles."	Average Miles per Ton.	Earnings.	Earnings per "Ton-mile."	Per cent. on Total Tonnage.
	No.	No.	No.	£	d.	%
Agricultural produce ..	77,931	4,760,121	61.08	31,611	1.59	14.10
Hay, straw, chaff, and horse feed	50,218	2,582,752	51.43	18,367	1.70	9.08
Stable manure ..	2,696	89,991	33.38	422	1.12	0.49
Manures, other than stable	15,218	576,213	37.86	2,534	1.05	2.75
Fruit	10,513	581,549	55.31	6,405	2.64	1.90
Native coal	69,169	7,650,225	110.60	22,505	0.70	12.51
Minerals, other than native coal	76,046	1,784,522	23.46	13,827	1.85	13.76
Bark	1,022	35,747	34.88	434	2.91	0.19
Firewood	63,260	2,022,970	31.98	9,651	1.14	11.44
Timber	105,338	5,384,967	51.12	34,799	1.55	19.06
Wool	5,886	463.646	78.77	6,909	3.57	1.06
Miscellaneous goods ..	75,535	5,035,801	66.64	86,683	4.13	13.66
Total	552,832	30,966,504	56.01	234,147	1.81	100.00

16. Interest Returned on Capital Expenditure.—In the year 1901–2 the State Government railways made a profit of 2.94 per cent. on the capital expenditure at that time. In the subsequent years up to and including the year 1910–11, the percentages were 2.56, 3.11, 3.36, 3.98, 4.45, 4.32, 4.22, 4.26, and 4.63 respectively, rates which shew substantial increases with one exception on that for the first-named year. Since 1910-11, the rates have oscillated and have shewn a decreasing tendency, the rate for the year 1919–20 being 3.38, or 1.25 less than that for the year 1910–11. 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 rates of wages, while in recent years additional expenses have been incurred in consequence of the war. The return on the capital invested as at the 30th June, 1920, was not equal to the interest payable for that year, the rate of which was 4.33 per cent. This average, however, does not accurately express the position. At an early period the necessity for the construction of railways to open 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, nearly 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 yield 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 sub-section 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.

The losses during the last four years for all the States are due to the causes to which allusion has already been made in the remarks as to increases in the working expenses of the railways (see pp. 591 and 592 *ante*). It will be observed in the following table that the interest charges in 1920 were £1,890,237 higher than they were in 1916.

STATE RAILWAYS.—INTEREST ON LOAN EXPENDITURE, PROFIT OR LOSS, AND PERCENTAGE OF PROFIT OR LOSS ON TOTAL COST, 1916 TO 1920.

Year ended 30th June.	N.S.W.	Victoria. (a)	Q'land.	S. Aust.	W. Aust.	Tasmania.	All States.
AMOUNT OF INTEREST ON RAILWAY LOAN EXPENDITURE.							
	£	£	£	£	£	£	£
1916	2,568,659	1,922,410	1,418,280	663,588	625,250	180,772	7,378,959
1917	2,858,789	2,006,197	1,500,800	673,985	643,765	181,617	7,865,153
1918	3,043,349	2,120,547	1,559,136	716,234	654,059	183,977	8,277,302
1919	3,265,540	2,157,798	1,617,404	747,671	665,100	186,402	8,639,915
1920	3,641,988	2,225,881	1,723,760	789,362	690,618	197,587	9,269,196
PROFIT OR LOSS AFTER PAYMENT OF WORKING EXPENSES, INTEREST, AND OTHER CHARGES.(b)							
	£	£	£	£	£	£	£
1916	— 223,749	— 214,659	— 417,991	— 243,667	— 48,795	— 81,395	—1,230,256
1917	— 394,064	— 207,518	— 663,020	— 125,796	— 214,834	— 130,298	—1,735,530
1918	— 28,916	— 9,380	— 945,372	— 131,740	— 289,005	— 105,194	—1,509,607
1919	— 211,817	— 5,184	—1,323,252	— 185,896	— 359,794	— 109,633	—2,195,576
1920	— 129,125	— 59,821	—1,037,001	— 70,182	— 399,215	— 81,601	—1,826,945
PERCENTAGE OF PROFIT OR LOSS ON CAPITAL COST OF CONSTRUCTION AND EQUIPMENT.(b)							
	%	%	%	%	%	%	%
1916	—0.33	—0.39	—1.20	—1.41	—0.29	—1.70	—0.62
1917	—0.55	—0.37	—1.82	—0.71	—1.23	—2.65	—0.85
1918	—0.03	—0.02	—2.53	—0.73	—1.63	—2.11	—0.72
1919	—0.28	—0.01	—3.46	—1.00	—2.00	—2.16	—1.03
1920	—0.16	—0.10	—2.71	—0.36	—2.21	—1.55	—0.83

(a) Allowing for payment of special expenditure and charges (see sub-section 11 above).
(b) — indicates a loss.

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 workingmen, 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*). On the average, mileage-rate fares run about 1.91 pence per mile for first-class and about 1.22 pence per mile for second-class single tickets. 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 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, whilst in Western Australia the return fares are double the single rates. In all the States 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 shews the passenger fares for different distances charged in each State between stations for which specific fares are not fixed :—

ORDINARY PASSENGER MILEAGE RATES ON STATE RAILWAYS, 1920.

State.	For a Journey of—															
	50 Miles.		100 Miles.		200 Miles.		300 Miles.		400 Miles.		500 Miles.					
	First Class.	Second Class.	First Class.	Second Class.	First Class.	Second Class.	First Class.	Second Class.	First Class.	Second Class.	First Class.	Second Class.				
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.				
New South Wales	9 5	6 2	18 10	12 6	37 8	23 4	56 0	34 1	74 5	43 6	87 0	49 7				
Victoria ..	8 3	5 6	16 0	10 8	32 0	21 4	44 9	29 10	54 3	36 2	63 9	42 6				
Queensland ..	9 4	6 3	17 0	11 0	32 0	20 6	46 0	28 9	59 0	36 0	71 0	43 0				
South Australia	8 4	5 7	16 9	11 3	33 6	22 3	50 0	33 6	66 9	44 6	83 6	55 9				
Western Australia ..	7 6	4 8	15 0	9 5	30 0	18 9	45 0	28 2	60 0	37 6	75 0	46 11				
Tasmania ..	9 0	6 0	18 0	11 9	35 6	23 9	53 0	35 6	..	..	..	..				
Average ..	8 8	5 8	16 11	11 1	33 5	21 8	49 2	31 8	62 5	39 6	76 1	47 7				
Average per passenger mile..	d. 2.08	d. 1.36	d. 2.03	d. 1.33	d. 2.00	d. 1.30	d. 1.97	d. 1.27	d. 1.87	d. 1.18	d. 1.83	d. 1.14				

The above rates were those in force in June, 1920. Since that time several changes have been made in the rates, of which full particulars are not yet available.

(ii) *Parcel Rates.* In all the States parcels may be transmitted by passenger train at 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 25 miles to thirteen shillings and fourpence for a parcel weighing from 85 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 fourteen shillings and fourpence. The rate in Queensland for a parcel weighing from 85 to 112 lbs. for 500 miles is sixteen shillings and threepence; in South Australia for 550 miles fourteen shillings and ten pence; in Western Australia for a parcel weighing from 99 lbs. to 112 lbs. for 500 miles fourteen shillings; and in Tasmania for a distance of 250 miles the rate is eight shillings.

(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 eight in Victoria to fifteen 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 under class (*c*) special rates, lower than the mileage rates.

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, 1920.

State.	Charge per Ton in Truck-loads for a Haul of—					
	50 Miles.	100 Miles.	200 Miles.	300 Miles.	400 Miles.	500 Miles.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
New South Wales	6 6	9 9	12 3	13 8	14 9	15 7
Victoria	5 10	9 2	12 2	14 0	15 10	17 6
Queensland	5 8	10 2	12 0	13 0	14 6	15 6
South Australia (a)	7 10	11 1	16 5	21 9	27 1	32 3
Western Australia	7 3	9 11	13 1	18 0	23 0	25 0
Tasmania	7 7	12 10	15 0	15 0	..	..
Average	6 9	10 6	13 6	15 11	19 0	21 2
Average per ton-mile ..	d. 1.62	d 1.26	d. 0.81	d. 0.63	d. 0.57	d. 0.51

(a) Wheat is carried at a lower rate than that specified above for agricultural produce.

The next table shews 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, 1920.

State.	Charge per ton for a Haul of—											
	50 Miles.	100 Miles.	200 Miles.	300 Miles.	400 Miles.	500 Miles.	50 Miles.	100 Miles.	200 Miles.	300 Miles.	400 Miles.	500 Miles.
	Highest Class Freight.						Lowest Class Freight.					
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
New South Wales ..	32 11	64 3	111 11	141 10	153 9	165 8	4 4	5 7	6 5	8 4	10 7	12 10
Victoria ..	27 6	53 6	101 0	138 0	169 9	201 9	3 0	4 6	6 8	8 10	9 10	10 8
Queensland ..	51 10	89 4	159 8	a220 6	a254 1	a268 4	5 8	10 2	17 3	21 2	25 8	30 3
South Australia ..	34 5	66 2	124 5	171 0	211 9	246 8	4 3	8 0	12 1	14 3	16 2	18 1
Western Australia ..	44 1	74 1	123 10	174 9	212 4	243 8	2 3	3 1	5 2	7 3	9 4	11 5
Tasmania ..	37 2	59 5	110 0	..	..	..	3 1	6 2	9 4	..	..	..
Average ..	38 0	67 10	122 8	169 3	200 4	225 3	3 9	6 3	9 6	12 0	14 4	16 9
Average per ton mile..	d. 9.12	d. 8.14	d. 7.36	d. 6.77	d. 6.04	d. 5.41	d. 0.90	d. 0.75	d. 0.57	d. 0.48	d. 0.43	d. 0.40

(a) Maximum freight for distances up to 500 miles on highest class goods to Western stations is 210 shillings per ton.

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, and posts and rails.

18. Numbers and Description of Rolling Stock, 1919-20.—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, 1919-20.

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	..	1,279	..	..	..	1,279
Victoria	770	..	..	17	..	787
Queensland	..	..	661	..	5	666
South Australia	242	..	245	..	..	487
Western Australia	..	..	423	..	..	423
Tasmania	..	..	73	7	..	80
Total	1,012	1,279	1,402	24	5	3,722

PASSENGER VEHICLES.

	Ordinary.	With Motors.	Ordinary.	With Motor.	Ordinary.	With Motors.			Ordinary.	With Motors.
New South Wales	..	..	1,664	1	..	..	..	..	1,664	1
Victoria	1,485	151	..	..	..	..	49	..	1,534	151
Queensland	..	..	..	..	817	16	..	7	824	16
South Australia	448	1	..	..	175	2	..	..	623	3
Western Australia	..	..	..	..	396	..	..	..	396	..
Tasmania	..	..	..	..	170	2	..	6	176	2
Total	1,933	152	1,664	1	1,558	20	49	13	5,217	173

VEHICLES, OTHER THAN PASSENGER.

New South Wales	..	22,962	..	..	..	22,962
Victoria	20,190	..	..	249	..	20,439
Queensland	..	..	14,523	..	148	14,671
South Australia	4,042	..	5,419	..	..	9,461
Western Australia	..	..	10,127	..	..	10,127
Tasmania	..	..	1,780	..	77	1,857
Total	24,232	22,962	31,849	249	225	79,517

19. Number of Railway Employees.—The following table shews the number of employees in the Railway Department of each State in each year from 1916 to 1920 inclusive, classified according to (*a*) salaried staff, and (*b*) wages staff :—

In the period under review it will be seen that the totals of salaried and wages staffs have fallen from 93,576 in 1916 to 85,837 in 1918, but rose to 91,536 in 1920, the latter being a decrease of 2.17 per cent. of the number in 1916.

Separate returns for salaried and wages staff are not available for South Australia prior to 1916–17; the number of salaried staff is therefore included in the wages staff.

STATE RAILWAYS.—NUMBER OF EMPLOYEES IN RAILWAY DEPARTMENTS, 1916 TO 1920.

State.	At 30th June—									
	1916.		1917.		1918.		1919.		1920.	
	Salaried Staff.	Wages Staff.	Salaried Staff.	Wages Staff.	Salaried Staff.	Wages Staff.	Salaried Staff.	Wages Staff.	Salaried Staff.	Wages Staff.
New South Wales ..	b4,148	b34,634	b4,590	b30,726	b4,870	b29,370	b4,937	b29,776	4,913	b29,807
Victoria	2,428	20,500	b2,344	b17,126	c2,380	c16,859	c2,525	c17,285	2,727	21,824
Queensland ..	2,889	9,877	3,024	10,784	3,251	11,090	3,296	11,222	3,239	10,692
South Australia a ..	..	10,460	1,057	9,241	b1,099	b8,904	b1,075	b8,570	1,004	8,122
Western Australia ..	1,011	6,204	961	5,623	972	5,675	1,037	6,057	1,115	6,553
Tasmania	222	1,203	233	1,151	221	1,146	199	1,240	210	1,330
All States	10,698	82,878	12,209	74,651	12,793	73,044	13,069	74,150	13,208	78,328

(a) Prior to 1916–17, separate returns for salaried and wages staffs are not available; the number of salaried staff in the earlier years is included with the wages staff. (b) Including those absent on military or naval service. (c) Excluding those absent on active service.

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 each of the years 1915–16 to 1919–20 inclusive :—

STATE RAILWAYS.—NUMBER OF PERSONS KILLED AND INJURED, 1916 TO 1920.

State.	In year ended 30th June—									
	1916.		1917.		1918.		1919.		1920.	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
New South Wales	87	710	63	572	59	496	44	690	70	751
Victoria	54	534	32	465	44	561	52	510	38	451
Queensland	26	181	30	280	21	205	28	162	20	694
South Australia	14	193	11	247	17	189	22	193	13	157
Western Australia	18	131	20	106	13	86	20	140	30	127
Tasmania	10	89	1	4	2	7	4	7	3	31
All States	209	1,838	157	1,674	156	1,544	170	1,702	174	2,211

(D) Graphical Representation of Government Railway Development.

1. **General.**—Railways are so important a factor in the development of Australia that it has been deemed desirable to represent graphically the main facts of their progress from 1860 onwards. To this end the graphs shewn on pages 572 to 574 have been prepared.

2. **Capital Cost and Mileage Open** (page 572).—The graph shews 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, though in recent years a slight increase has been in evidence.

3. **Cost per Mile Open.**—The fluctuations in cost per mile open from 1860 are clearly indicated by the graph on page 572. 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, £9,466, in 1911. In 1912, 1913, and 1914 it rose to £9,544, £9,665, and £9,820 respectively, but fell in 1915 to £9,632. In 1916 it rose to £9,895, in 1917 was £9,901, in 1918 £9,943, and fell slightly in 1919 to £9,942, and rose to £9,985 in 1920.

4. **Gross Revenue.**—This graph (page 572) exhibits considerable irregularities, the most striking of which are the maxima in 1892, 1902, 1914, and 1920. 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. Since 1915 each year has given an increase over the previous year's figures, the increases for 1916, 1917, 1918, 1919, and 1920 being £1,260,646, £813,479, £1,280,565, £983,563, and £6,802,538 respectively.

5. **Working Expenses.**—In this case the graph (page 572) has the same characteristics as those of gross revenue. It should be noted, however, that working expenses have been increasing during the last five years at a greater rate than gross revenue, owing to increases in wages and the higher cost of materials.

6. **Net Revenue.**—This graph (page 572) shews a fairly constant rate of increase up to 1900. Thence to 1903 there was a continuous fall, which was followed by a rapid rise to 1907. In 1911 and 1914 there were maxima, followed by a fall in 1915 and a rise in 1916. In 1917 there was a slight fall, and a substantial rise in 1918. In 1919 there was a fall, with a considerable rise in 1920.

7. **Percentage of Working Expenses on Gross Revenue.**—This is shewn for each State and for the Commonwealth, from the year 1855, on page 573. The curve for the Commonwealth 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 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, rose again in 1917, declined in 1918, but rose in 1919 and 1920. In the case of the individual States it will be seen that the curves shew considerable fluctuations, particularly in the early years of the period under review.

8. **Percentage of Net Revenue on Capital Cost.**—The fluctuations in this item from the year 1855 are shewn in the graph on page 574 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 for the Commonwealth 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, 4.45, and 4.54 per cent. Since 1911 the rate has varied considerably, that for 1920 being 1.36 lower than that for 1911.

For the individual States the results are in general very satisfactory up to 1911. The greatest maximum percentage attained by each of the States in any year during the period under review is as follows:—New South Wales 5.31 in 1881, Victoria 4.51, Queensland 4.51, and South Australia 6.47 in 1911, Western Australia 11.48 in 1896, and Tasmania 2.49 in 1913. Since 1911 (1913 in the case of Tasmania) the States have shewn varying and declining rates. The effect of the drought of 1915 is discernible, also the rise of wages and higher cost of materials, to which allusion has already been made.

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.

9. **General Indications of Graphs.**—Reviewing the cost of railways, as a whole, it may be noted that at the undermentioned dates the average cost per mile open was as follows :—

GOVERNMENT RAILWAYS.—AVERAGE COST PER MILE OF LINE OPEN, 1859 TO 1920.

STATE AND FEDERAL.

Date ..	1859.	1869.	1879.	1889.	1899.	1909.	1919.	1920.
Cost per mile	£ 27,857	£ 19,857	£ 11,891	£ 10,367	£ 9,722	£ 9,489	£ 9,942	£ 9,985

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 serves to indicate the great elasticity of the economic condition of the Commonwealth. Although the percentage of net revenue on capital cost during the year 1919–20 has been exceeded in previous years, nevertheless it is satisfactory that the 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 £231,115,732 for construction and equipment up to the 30th June, 1920, should yield a return of no less than 3.18 per cent.

It should be mentioned that the graphs for the Commonwealth include the Federal railways.

(E) Government Railways Generally.

1. **Rolling Stock.**—In the following table 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, 1911, 1916, and 1920 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 GOVERNMENT RAILWAYS AS AT 30th JUNE, 1901, 1911, 1916, AND 1920.

LOCOMOTIVES.

Gauge.	At 30th June—							
	1901.		1911.		1916.		1920.	
	No.	%	No.	%	No.	%	No.	%
Mainland—								
5 ft. 3 in. ..	688	35.23	705	26.84	1,031	28.66	1,012	27.16
4 ft. 8½ in. ..	495	25.34	903	34.37	1,247	34.67	1,349	36.20
3 ft. 6 in. ..	765	39.17	1,009	38.41	1,298	36.09	1,343	36.07
2 ft. 6 in. ..	5	0.26	10	0.38	17	0.47	17	0.46
2 ft. 0 in. ..	..	..	..	..	4	0.11	5	0.11
Total ..	1,953	100.00	2,627	100.00	3,597	100.00	3,726	100.00
Tasmania—								
3 ft. 6 in. ..	64	..	72	..	73	..	73	..
2 ft. 0 in. ..	7	..	7	..	7	..	7	..
Grand Total	2,024	..	2,706	..	3,677	..	3,806	..

ROLLING STOCK EMPLOYED ON THE FEDERAL AND STATE GOVERNMENT RAILWAYS—*continued.*

PASSENGER VEHICLES, INCLUDING THOSE FITTED WITH MOTORS. (See below.)

Gauge.	At 30th June—							
	1901.		1911.		1916.		1920.	
	No.	%	No.	%	No.	%	No.	%
Mainland—								
5 ft. 3 in. ..	1,365	49.71	1,618	42.50	1,958	39.68	2,085	39.72
4 ft. 8½ in. ..	610	22.21	1,136	29.84	1,636	33.15	1,698	32.35
3 ft. 6 in. ..	761	27.71	1,032	27.11	1,300	26.34	1,410	26.87
2 ft. 6 in. ..	10	0.37	21	0.55	34	0.69	49	0.93
2 ft. 0 in. ..	..	..	..	..	7	0.14	7	0.13
Total ..	2,746	100.00	3,807	100.00	4,935	100.00	5,249	100.00
Tasmania—								
3 ft. 6 in. ..	163	..	170	..	167	..	172	..
2 ft. 0 in. ..	8	..	6	..	6	..	6	..
Grand Total	2,917	..	3,983	..	5,108	..	5,427	..

PASSENGER VEHICLES FITTED WITH MOTORS, INCLUDED IN TABLE OF PASSENGER VEHICLES ABOVE.

Gauge.	At 30th June—			
	1901.	1911.	1916.	1920.
Mainland—				
5 ft. 3 in. ..	2	..	4	152
4 ft. 8½ in. ..	..	..	..	1
3 ft. 6 in. ..	..	2	7	18
Total ..	2	2	11	171
Tasmania—				
3 ft. 6 in. ..	..	..	..	2
Grand Total	2	2	11	173

VEHICLES, OTHER THAN PASSENGER.

Gauge.	At 30th June—							
	1901.		1911.		1916.		1920.	
	No.	%	No.	%	No.	%	No.	%
Mainland—								
5 ft. 3 in. ..	12,204	31.05	15,430	27.80	23,531	30.93	24,232	30.77
4 ft. 8½ in. ..	11,540	29.36	17,112	30.83	22,865	30.06	23,708	30.11
3 ft. 6 in. ..	15,481	39.38	22,775	41.03	29,343	38.57	30,411	38.62
2 ft. 6 in. ..	82	0.21	190	0.34	248	0.33	249	0.32
2 ft. 0 in. ..	..	..	..	..	83	0.11	148	0.18
Total ..	39,307	100.00	55,507	100.00	76,070	100.00	78,748	100.00
Tasmania—								
3 ft. 6 in. ..	1,389	..	1,618	..	1,710	..	1,780	..
2 ft. 0 in. ..	50	..	71	..	77	..	77	..
Grand Total	40,746	..	57,196	..	77,857	..	80,605	..

In the nineteen 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 8.07 per cent., the 4-ft. 8½-in. gauge increased by 10.86, and the 3-ft. 6-in. gauge fallen by 3.10 per cent.

As regards passenger vehicles the alterations are as follow: on the 5-ft. 3-in. gauge the percentage has fallen by 10.00 per cent., the 4-ft. 8½-in. gauge increased by 10.15, and the 3-ft. 6-in. gauge fallen by 0.84 per cent.

In the case of vehicles other than passenger the changes have been small, the 5-ft. 3-in. gauge percentage having fallen 0.28, the 4-ft. 8½-in. gauge risen by 0.75, and the 3-ft. 6-in. gauge fallen by 0.76 per cent.

2. **Railway Mileage (Route) Open for Traffic.**—The Government railway route mileages open for traffic, classified according to gauge, as at the 30th June in each of the years 1901, 1911, 1916, and 1920, 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 preceding table relating to rolling stock:—

RAILWAY (ROUTE) MILEAGE OF THE FEDERAL AND STATE GOVERNMENT RAILWAYS, CLASSIFIED ACCORDING TO GAUGE AS AT 30th JUNE IN EACH OF THE YEARS 1901, 1911, 1916, AND 1920, WITH PERCENTAGES ON TOTAL FOR MAINLAND.

Gauge.	At 30th June—							
	1901.		1911.		1916.		1920.	
	Miles.	%	Miles.	%	Miles.	%	Miles.	%
Mainland—								
5 ft. 3 in. ..	3,696.77	30.50	4,023.61	25.78	4,955.44	24.56	5,215.70	23.16
4 ft. 8½ in. ..	2,805.34	23.14	3,717.17	23.82	4,925.86	24.41	6,032.05	26.79
3 ft. 6 in. ..	5,571.02	45.96	7,742.96	49.62	10,143.38	50.28	11,118.81	49.38
2 ft. 6 in. ..	48.25	0.40	121.90	0.78	121.90	0.60	121.90	0.54
2 ft. 0 in. ..	..	..	..	..	29.35	0.15	30.26	0.13
Total ..	12,121.38	100.00	15,605.64	100.00	20,175.93	100.00	22,518.72	100.00
Tasmania—								
3 ft. 6 in. ..	439.33	..	448.93	..	538.73	..	605.12	..
2 ft. 0 in. ..	18.72	..	23.57	..	23.58	..	23.58	..
Grand Total	12,579.43	..	16,078.14	..	20,738.24	..	23,147.42	..

From the above table it will be seen that in the nineteen years from 1901 to 1920 the 5-ft. 3-in. gauge percentage has fallen by 7.34 per cent., and the 4-ft. 8½-in. and 3-ft. 6-in. gauges risen by 3.65 and 3.42 per cent. respectively.

3. Railway Mileage (Track) Open for Traffic. In the following table, the track mileages of all Government railways and sidings, exclusive of Tasmania, are shewn for the years ended 30th June, 1901, 1911, 1916 and 1919, classified according to gauge, together with the percentages of each mileage on the total.

RAILWAY (TRACK) MILEAGE, FEDERAL AND STATE GOVERNMENT RAILWAYS, EXCLUSIVE OF TASMANIA, ACCORDING TO GAUGE AS AT 30th JUNE, 1901-1919.

Gauge.	At 30th June—							
	1901.		1911.		1916.		1919.	
	Miles.	%	Miles.	%	Miles.	%	Miles.	%
5 ft. 3 in. ..	4,531.09	32.13	5,102.77	27.64	6,309.82	26.13	6,586.49	24.95
4 ft. 8½ in. ..	3,387.08	24.01	4,666.34	25.28	6,442.87	26.68	7,549.03	28.60
3 ft. 6 in. ..	6,134.78	43.50	8,562.97	46.38	11,236.96	46.53	12,101.70	45.84
2 ft. 6 in. ..	51.00	0.36	128.65	0.70	130.90	0.54	130.97	0.50
2 ft. 0 in. ..	..	..	..	..	29.35	0.12	29.35	0.11
Total ..	14,103.95	100.00	18,460.73	100.00	24,149.90	100.00	26,397.54	100 00

In the eighteen years under review, the 5 ft. 3 in. gauge percentage has fallen by 7.18 per cent., and the 4 ft. 8½ in. and 3 ft. 6 in. gauges have risen by 4.59 and 2.34 per cent. respectively.

4. 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, 1920, 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, 1920.

Particulars.		Federal Railways.	State Railways.	Total for Commonwealth.
Total mileage open	Miles	1,732.88	21,414.54	23,147.42
Average miles open during the year ..	„	1,732.88	21,284.00	23,016.88
Total train mileage	„	725,974	59,611,082	60,337,056
Total cost of construction of lines open	£	11,094,910	a220,020,822	a231,115,732
Cost per mile	£	6,402	a10,275	a9,985
Gross revenue	£	315,757	31,793,562	32,109,319
Working expenses	£	417,637	24,351,312	24,768,949
Percentage of working expenses on gross revenue	%	132.26	76.59	77.14
Net revenue	£	—101,880	7,442,250	7,340,370
Interest payable	£	363,646	9,269,196	9,632,842
Number of passenger journeys ..	No.	83,528	320,375,842	320,459,370
Tonnage of goods and live stock carried	Tons	176,427	30,622,786	30,799,213
Number of employees at 30th June, 1920—				
Salaried	No.	196	13,208	13,404
Wages	„	877	78,328	79,205
Number of persons killed and injured during the year through train accidents and movement of rolling stock—				
Killed	„	2	174	176
Injured	„	62	2,211	2,273

(a) Exclusive of lines from Mount Gambier to Victorian border, and from Murrayville to Victorian border.

NOTE.—The sign — denotes a loss on working.

5. **Government Railway Facilities.**—On page 566 *ante* the population per mile of line open for general traffic is given in respect of the States' railways for each State. In the following table is given the mileage of all Government railways, State and Federal, in each State and Territory, per 1,000 of population :—

MILEAGE OF ALL GOVERNMENT RAILWAYS, FEDERAL AND STATE, PER 1,000 OF POPULATION IN EACH STATE AND TERRITORY AS AT 30th JUNE, 1920.

State or Territory.	Population 30th June, 1920.	Length of Line Open (Route).			Mileage per 1,000 of Population.
		State.	Federal.	Total.	
	No.	Miles.	Miles.	Miles.	Miles.
New South Wales ..	2,028,673	5,015.32	..	5,015.32	2.47
Victoria	1,504,260	4,214.00	..	4,214.00	2.80
Queensland	737.085	5,685.10	..	5 685.10	7.71
South Australia	472,432	2,333.19	1,075.32	3,408.51	7.22
Western Australia ..	334,176	3,538.23	453.94	3,992.17	11.95
Tasmania	216,643	628.70	..	628.70	2.90
Northern Territory ..	4,243	..	198.68	198.68	46.82
Federal Territory ..	2,222	..	4.94	4.94	2.22
Commonwealth	5,299,734	21,414.54	1,732.88	23,147.42	4.37

(F) Private Railways.

1. **Total Mileage Open, 1919–20.**—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 connexion with the timber and sugar-milling industries, and for conveying firewood for mining purposes. 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 for general and special purposes during 1919–20. A classification of these lines according to their gauge has already been given (see page 567).

MILEAGE OF PRIVATE RAILWAYS OPEN, 1919–20.

Particulars.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	C'wealth.
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
For general traffic ..	189.32	24.94	278.68	33.80	278.35	162.86	967.95
For special purposes	172.35	45.71	982.91	15.95	575.50	48.69	1,841.11
Total ..	361.67	70.65	1,261.59	49.75	853.85	211.55	2,809.06

2. **Classification of Private Railways.**—In previous issues of the Year Book, a classification has been given shewing particulars of the private railways open for general traffic and for special purposes. On account of the necessity for economy of space, this classification has been omitted from this issue and has been transferred to the "Transportation Bulletin No. 12."

3. **New South Wales.**—In this State the mileage of private railways open to the public for general traffic at the end of 1919 was 184.32, and of lines used for special purposes, 160.83 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 1919-20 of the operations of lines open for general traffic are given, so far as available, in the table on page 614.

(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 the Deniliquin and Moama Railway 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 36.67 miles. (*c*) *South Maitland Railways.* These lines, belonging to the South Maitland Railways, Limited, run from East Greta Junction, on the Northern line of the Government railways, to Stanford Merthyr, a distance of 7.36 miles, and from Aberdare Junction to Cessnock, 12.08 miles —a total of 19.44 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, thence to Belmont, and from Burwood Junction to Dudley Boundary and branches, a total distance of 12.00 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 5.13 miles. (*f*) *Hexham-Minmi Railway.* This line branches from the Northern line of the Government railways at Hexham, and has a length of 6.00 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, 0.83 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 connexion with the reservoir at Burrinjuck. (*j*) *Liverpool–Holdsworthy Line* is a line 5 miles in length, worked by the Railway Department, for which service a sum of £300 per annum is paid by the Defence Department.

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 39.51 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. The mileage of this line is included in that of the Government railways, and it has a gauge of 3 feet 6 inches.

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, 1920, was £39,229, paid out of a loan advanced by the Victorian Government. The total length is 13.94 miles. The line is at present controlled by the Kerang Shire Council, but proposals have been made for its transfer to the Railway Department. (*b*) *Yarra Junction to Powelltown.* This line has a length of 11 miles, and is worked mainly for timber purposes.

A line running from Elsternwick to Oakleigh, a distance of about 5 miles, was constructed by a private company many years ago. It was never in general use, and has for some time been dismantled.

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 102.73 miles. On 20th June, 1919, it was vested in the Queensland Railways Commissioner. (*b*) *The Stannary Hills Line.* This line branches from the Chillagoe railway at Boonmoo and runs to Rocky Bluff, via Stannary Hills, a total distance of 21 miles. The gradients on this line, which has a gauge of 2 feet, range as high as 1 in 27, while the radius of some of the curves is as low as 1¼ chains. An additional length of 8 miles has been surveyed with a view to extending the line.

(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 £5,000 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 a private railway open for general traffic is owned by the Broken Hill Proprietary Company, and runs from Iron Knob to the seaboard near the head of Spencer's Gulf, a distance of 33.80 miles. The line is utilized for the carriage of ore for use in connexion with the smelting works at Port Pirie and the steel works at Newcastle. There is also a line from Marion Bay, having a length of 5 miles, used for mining purposes.

7. **Western Australia.**—Owing to the difficulty experienced at one time by the Government 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 connexion with the timber industry. (i) *The Midland Railway.* This line is 278.35 miles in length, and runs from 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 for 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 been built chiefly under special timber concessions and leases. There were, at latest date available, in all eight 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 239.69 miles. (iv) *Other Lines.* There are also several other lines in various parts of the State used chiefly in connexion with the timber industry.

8. **Tasmania.**—In this State the three private lines open for general traffic are 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 102.94 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, 22.13 miles in length, was constructed in 1895–6, while the latter line, 27.80 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 worked 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 9.99 miles.

9. Operations of Private Railways, 1919–20.—The tabular statement given below shews particulars, so far as returns are available, for the year 1919–20, of all private railways open to the public for general traffic in the Commonwealth :—

PARTICULARS OF PRIVATE RAILWAYS OPEN FOR GENERAL TRAFFIC, 1919–20.

Line.	Miles Open (route).	Train Miles.	Capital Cost.	Gross Revenue.	Expenses.		Rolling Stock.			Passenger Journeys.	Tons of Goods, etc.	No. of Employees.
					Working.	Interest, etc.	Locos.	Coaches.	Other Vehicles.			
	No.	No.	£	£	£	£	No.	No.	No.	No.	Tons.	No.
NEW SOUTH WALES.												
C'wealth Oil Corp'r'n	33.00	17,013	194,500	6,115	8,615	(h)	4	(d)3	69	1,512	15,938	17
Deniliquin-Moama..	45.00	45,375	162,671	30,358	20,276	(h)	4	6	62	22,668	45,501	43
South Maitland ..	19.44	430,241	546,086	142,201	114,238	27,291	23	27	45	789,664	m202,100	296
Goon'h-Burrinj'k(a)	26.25	27,950	80,756	1,010	(i)9,420	(j)	4	3	28	2,896	♂ 3,461	29
Hexham-Minmi ..	6.00	1,968	1,000,000	200	352	(h)	1	1	..	245	600	4
New Redhead Co. ..	12.00	(h)	102,000	(h)	(h)	(h)	(c)	(c)	(c)	(h)	(h)	(c)
Seaham Colliery Co.	5.13	7,852	25,000	1,223	2,898	(h)	2	2	2	18,382	9,179	13
Silverton Tramway(l)	36.67	45,360	482,724	48,824	47,557	(h)	20	1	676	35,826	122,218	135
Liverp'l-H'dsw'thy(l)	5.00	1,688	35,354	(h)	(h)	(h)	(c)	(c)	(c)	(h)	(h)	(c)
Warwick Farm(l) ..	0.83	(h)	(h)	(h)	(h)	(h)	(c)	(c)	(c)	(h)	(h)	(c)
Total(b) ..	189.32	577,447	2,629,091	229,931	203,356	27,291	58	43	882	871,193	398,997	537
VICTORIA.												
Kerang-K'ndrook (n)	13.94	17,798	39,229	6,001	4,194	1,426	3	2	9	18,350	25,680	17
Yarra J.-Powellt'n(n)	11.00	29,000	47,400	5,800	4,186	465	2	2	33	12,500	59,000	13
Total ..	24.94	46,798	86,629	11,801	8,380	1,891	5	4	42	30,850	84,680	30
QUEENSLAND.												
Aramac-Barcaldine	41.50	15,212	86,739	13,911	7,386	4,256	2	2	2	5,719	11,877	15
Beaudesert(e) ..	33.00	(h)	93,559	12,337	10,651	..	1	3	1	14,090	11,585	27
Belmont Tramway	4.31	9,995	19,903	2,493	3,006	393	(c)	(c)	(c)	56,736	16,835	(c)
Buderim	7.00	(h)	(h)	(h)	(h)	(h)	(h)	(h)	(h)	(h)	(h)	(h)
Irvinebank ..	14.00	(h)	(h)	(h)	(h)	(h)	(h)	(h)	(h)	(h)	(h)	(h)
Douglas-Mossman	17.71	8,450	43,238	8,589	5,184	3,369	2	3	22	7,500	6,600	11
Invicta Mill ..	8.70	635	20,067	530	(h)	1,016	(c)	(c)	(c)	(h)	(h)	(c)
Lucinda Pt. to Stone R. and Lg. Pocket	50.75	(h)	(h)	(h)	(h)	(h)	2	3	82	(h)	42,517	(h)
Green Hills to Hambledon Junc. ..	4.13											
Macgregor(l) ..	22.13	3,283	66,328	1,610	2,057	(k) 1,213	(c)	(c)	(c)	767	6,223	5
Mapleton ..	15.00	(h)	(h)	(h)	(h)	(h)	(h)	(h)	(h)	(h)	(h)	(h)
Moreton Central S.M.	8.50	1,725	17,865	1,208	541	269	2	3	2	12,580	1,158	2
South Johnstone Central S.M. (l) ..	27.50	5,591	115,000	4,864	3,025	(h)	2	4	23	13,116	5,724	7
Stannary Hills ..	21.00	16,159	(f)64,320	4,031	5,675	(h)	2	2	76	1,916	12,439	8
Tannymorell Tram	3.45	2,237	(h)	296	148	(c)	(c)	(c)	(c)	1,022	3,668	(c)
Total(b) ..	278.68	63,287	527,019	49,869	37,673	10,516	13	20	208	113,446	118,626	75
SOUTH AUSTRALIA.												
Iron Knob(b) ..	33.80	70,350	(h)	(h)	(h)	(h)	5	3	155	839	309,800	42
WESTERN AUSTRALIA.												
Midland Railway(l)	278.35	296,611	(f) 2,036,855	129,057	80,483	(h)	17	18	402	62,972	99,399	247
TASMANIA.												
Emu Bay Railway(g)	102.94	105,801	613,137	67,845	40,701	21,656	9	6	155	30,348	51,662	169
Magnet Railway(l)..	9.99	3,640	18,750	331	1,675	(h)	2	1	6	886	425	8
Mt. Lyell Railway(n)	22.13	44,249	216,086	26,883	23,955	(h)	7	7	117	22,921	40,776	104
Nth. Mt. Lyell Rly(n)	27.80	8,470	316,638	4,394	8,086	(h)	4	4	56	3,620	13,034	20
Total (b)	162.86	162,160	1,164,611	99,453	74,417	21,656	22	18	334	57,775	105,897	301
Total for C'wealth(b)	967.95	1,216.653	6,444.205	520,111	404,309	61,354	120	106	2023	1,137,075	1,117,399	1232

(a) The property of Commissioner of Water Conservation and Irrigation; for year ended 30th June, 1920. (b) Incomplete. (c) Worked by Government Railways. (d) Including one motor car. (e) For year ended 31st December, 1916. (f) For year ended 30th June, 1917. (g) Including 47.66 miles owned by the Emu Bay and Mount Bischoff Railway Company. (h) Not available. (i) Including interest. (j) Included in working expenses. (k) Rental of Permanent Way Material. (l) For year ended 30th June, 1920. (m) Exclusive of shipment coal. (n) For year ended 30th September, 1920.

10. **Comparative Railway Statistics.**—On page 566 *ante* a table is given shewing the railway facilities in 1919–20 in the States, in the Northern Territory, and in the Commonwealth, the railway mileage open for traffic being compared both with the area and population.

In the table below, comparative railway statistics of a like character are given in respect of the principal countries of the world at certain dates. The dates have been so chosen as to bring into relation the latest accurate figures for both population and railway mileage.

COMPARATIVE RAILWAY STATISTICS, VARIOUS COUNTRIES.

Country.	Year.	Miles of Railway.	Population.	Area in Square Miles.	Miles of Railway.	
					Per 1,000 of Population.	Per 1,000 Sq. Miles of Territory.
Europe—						
United Kingdom ..	1919	23,725	47,000,700	121,633	0.50	195.05
Austria	1914	15,739	29,193,293	115,882	0.54	135.82
Belgium	1914	5,451	7,642,054	11,373	0.71	479.29
Denmark	1918	2,645	3,032,891	(c) 15,042	0.87	175.84
France	1914	a31,958	39,601,509	207,054	0.81	154.35
Germany	1914	39,600	64,114,100	208,780	0.62	189.67
Greece	1914	1,365	4,821,300	41,933	0.28	32.55
Hungary	1914	13,589	21,134,862	125,609	0.64	108.18
Italy	1917	11,891	36,740,000	110,632	0.32	107.48
Netherlands ..	1918	2,113	6,778,699	12,582	0.31	167.94
Norway	1918	2,010	2,632,010	125,001	0.76	16.08
Portugal	1913	1,854	5,957,985	35,490	0.31	52.24
Russia	1916	48,955	149,884,230	1,997,309	0.33	24.51
Spain	1917	9,306	20,695,691	(b) 190,050	0.45	48.99
Sweden	1917	9,303	5,813,850	173,035	1.60	53.76
Switzerland	1917	3,660	3,937,000	15,976	0.93	229.09
Asia—						
India	1918	36,333	315,156,396	1,802,629	0.12	20.16
Russia	1913	10,586	29,141,320	6,641,587	0.36	1.59
Africa—						
Egypt	1917	(d)2,874	12,710,120	350,000	0.23	8.21
Union of South Africa	1918	10,021	6,986,687	473,096	1.43	21.18
America, North—						
Canada	1917	38,604	8,835,000	3,729,665	4.37	10.35
Mexico	1914	15,840	15,501,684	767,198	1.02	20.65
United States ..	1916	266,381	105,253,300	2,973,890	2.53	89.57
America, South—						
Argentina	1918	21,880	8,284,266	1,153,119	2.64	18.97
Brazil	1917	17,477	30,492,275	3,275,510	0.57	5.34
Chile	1918	5,611	3,945,538	289,829	1.42	19.36
Australasia—						
Australia	**1920**	**25,956**	**5,299,734**	**2,974,581**	**4.90**	**8.73**
New Zealand ..	1920	3,134	1,257,405	104,751	2.49	29.92

(*a*) Including lines of "local" interest. (*b*) Exclusive of Balearic and Canary Islands.
(*c*) Exclusive of Faroe Islands. (*d*) Exclusive of 1,500 miles in the Sudan.

It will be seen from the above table that per 1,000 of population the Commonwealth of Australia had the greatest mileage (in 1920), 4.90 miles; the next in magnitude being Canada (1917) with 4.37 miles, Argentina (1918) with 2.64 miles, the United States (1916) with 2.53 miles, and New Zealand (1920) with 2.49 miles.

The least mileage per 1,000 of population is shown in the case of India (1918) with 0.12 mile, followed by Egypt (1917) with 0.23 mile.

With regard to the mileage per 1,000 square miles of territory, Belgium (1914) with 479.29 miles was easily first, followed by Switzerland (in 1917) with 229.09 miles, the United Kingdom (in 1919) with 195.05 miles, Germany (in 1914) with 189.67 miles, and Denmark (in 1918) with 175.84 miles.

The least mileage open per 1,000 square miles is that of Asiatic Russia (in 1913) with 1.59 miles, the next being 5.34 miles in the case of Brazil (1917).

§ 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.

In many parts of Australia private lines used for special purposes in connexion with the timber, mining, sugar, or other industries are often called tramways, but they are really private railways, and the traffic on them has nothing in common with that of the street tramways for the conveyance of passengers, which are dealt with in the present section.

(i) *Total Mileage Open and Classification of Lines.* The following tables shew the total mileage of tramway lines open for general passenger traffic in each State and in the Commonwealth for the year 1919–20, and also in the Commonwealth as a whole for the years 1910–11 to 1919–20, classified (*a*) according to the motive power utilised, (*b*) according to the nature of the authority by which the lines are controlled and (*c*) according to gauge :—

TRAMWAYS.—CLASSIFICATION OF MILEAGE OPEN FOR PASSENGER TRAFFIC IN EACH STATE AND IN THE COMMONWEALTH, 1919–20.

Nature of Motive Power, Controlling Authority, and Gauge.	N.S. Wales.	Victoria.	Q'land.	South Australia.	Western Australia.	Tasmania.	C'wealth.
ACCORDING TO MOTIVE POWER.							
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
Electric	155.35	105.26	42.60	66.03	50.66	23.13	443.03
Steam	73.96	1.15	6.00	..	17.75	34.03	132.89
Cable	..	45.90	..	..	..	..	45.90
Horse	..	0.63	..	*a*17.36	7.16	7.60	32.75
Total ..	229.31	152.94	48.60	83.39	75.57	64.76	654.57
ACCORDING TO CONTROLLING AUTHORITY.							
Government ..	225.81	118.13	..	17.36	52.16	27.13	440.59
Municipal ..	..	..	6.00	66.03	8.66	23.13	103.82
Private	3.50	34.81	42.60	..	14.75	14.50	110.16
Total ..	229.31	152.94	48.60	83.39	75.57	64.76	654.57
ACCORDING TO GAUGE.							
Gauge—							
5 ft. 3 in. ..	..	5.16	..	7.35	..	..	12.51
4 ft. 8½ in. ..	229.31	146.63	42.60	66.03	..	..	484.57
3 ft . 6 in. ..	..	1.15	6.00	10.01	58.66	50.26	126.08
2 ft. 0 in. ..	..	..	..	..	16.91	14.50	31.41
Total ..	229.31	152.94	48.60	83.39	75.57	64.76	654.57

(*a*) 16.36 miles included in South Australian Government railway mileage.

TRAMWAYS.—CLASSIFICATION OF MILEAGE OPEN FOR PASSENGER TRAFFIC IN THE COMMONWEALTH, 1910-11 TO 1919-20.

Nature of Motive Power, Controlling Authority, and Gauge.	1910-11.	1911-12.	1912-13.	1913-14.	1914-15.	1915-16.	1916-17.	1917-18.	1918-19.	1919-20.
According to Motive Power.										
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
Electric	297.34	322.24	345.07	365.39	386.30	404.76	422.89	426.40	430.87	443.03
Steam	96.66	91.78	91.65	108.65	112.50	112.50	113.06	120.61	127.69	132.89
Cable	46.04	46.04	46.04	46.04	46.04	46.04	46.04	46.04	45.92	45.90
Horse	60.61	51.44	50.51	54.51	53.05	42.97	43.61	41.12	23.74	32.75
Total ..	500.65	511.50	533.27	574.59	597.89	606.27	625.60	634.17	628.22	654.57
According to Controlling Authority.										
Government ..	241.72	247.61	256.96	309.44	319.50	322.75	371.08	372.44	364.89	440.59
Municipal ..	78.69	82.86	102.85	114.55	129.86	143.32	158.13	158.03	159.17	103.82
Private	180.24	181.03	173.46	150.60	148.53	140.20	96.39	103.70	104.16	110.16
Total ..	500.65	511.50	533.27	574.59	597.89	606.27	625.60	634.17	628.22	654.57
According to Gauge.										
Gauge—										
5 ft. 3 in. ..	14.77	14.77	14.80	14.80	15.12	15.12	12.51	12.51	12.51	12.51
4 ft. 8½ in. ..	374.17	384.89	407.62	420.93	438.97	444.60	467.46	469.76	473.28	484.57
3 ft. 6 in. ..	83.96	84.09	86.02	114.03	118.97	121.72	121.45	120.41	118.43	126.08
2 ft. 0 in. ..	27.75	27.75	24.83	24.83	24.83	24.83	24.18	31.49	24.00	31.41
Total ..	500.65	511.50	533.27	574.59	597.89	606.27	625.60	634.17	628.22	654.57

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, 1920, seven such systems in operation within the metropolitan area, the most important being the City and Suburban lines, 112.97 miles in length (207.10 miles single track); the North Shore line, 21.93 miles in length (37.20 miles single track); the Ashfield to Mortlake line, 8.47 miles in length (15.12 miles single track); Manly to the Spit, Brookvale, and Narrabeen, 10.73 miles in length (15.47 miles single track); and Rockdale to Brighton-le-Sands, 1.25 miles in length (single track). 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 (6.99 miles single track), and (*b*) from Arncliffe to Bexley, 2.62 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 ft. 8½ in.

(*a*) *Sydney Tramways.* In October, 1862, a horse tramway, 1¾ miles long, was opened for traffic in Sydney. Owing to the rails being laid higher than the road surface, the inconvenience thus caused to other traffic necessitated its removal under the authority of an Act passed in November, 1865, and it was not until the 15th 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 commenced by the opening of a section of the North Sydney lines on the 20th September, 1893. This was followed by the opening of the Ocean-street-Rose Bay line on the 4th October, 1898, and by the opening of the George-street-Pyrmont line on the 8th September, 1899, which introduced the electric system into the city. 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. With the exception of the Kogarah-Sans Souci and the Arncliffe-Bexley lines, the whole of the steam tramways in Sydney and suburbs have now been converted into electric lines, and provision for the extra power required for the electrification of the former of these two 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 on 31st December, 1887; the total length open on the 30th June, 1920, was 34.07 miles (44.42 miles single track). At Broken Hill and Parramatta the first sections of the tramways were opened in 1902. On the 30th June, 1920, 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, 4.06 miles long (single track), was opened in February, 1909, and the line from Sutherland to Cronulla, 7.40 miles long (single track), on the 12th June, 1911. 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, interest, percentages of working expenses on gross revenue, and of net earnings on capital cost, passengers carried and persons employed for the financial years 1916 to 1920:—

NEW SOUTH WALES.—PARTICULARS OF WORKING OF GOVERNMENT TRAMWAYS, 1916 TO 1920.

Year ended 30th June—	Mileage Open for Traffic. (Route.)	Total Cost of Construction and Equipment.	Gross Revenue.	Working Expenses.	Net Earnings.	Interest	Percentage of Working Expenses on Gross Revenue.	Percentage of Net Earnings on Capital Cost.	Passengers carried.	Persons employed.
	Miles.	£	£	£	£	£	%	%	No. '000	No.
1916 ..	220.83	8,166,423*a*	1,991,628	1,602,650	388,978	302,686	80.47	4.76	292,022	9,806
1917 ..	223.98	8,309,629*a*	2,008,539	1,691,367	317,172	335,361	84.21	3.82	295,304	9,763
1918 ..	225.35	8,470,091*a*	1,992,641	1,603,260	389,381	348,546	80.46	4.60	255,741	8,955
1919 ..	225.54	8,568,138*a*	2,237,701	1,850,724	386,977	368,529	82.71	4.52	268,798	9,028
1920 ..	225.81	8,768,548*a*	2,881,797	2,486,121	395,676	404,125	86.27	4.51	324,885	8,970

(*a*) £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 £404,125 for interest on the capital invested, was a loss of £8,448 in 1919-20 as compared with a profit of £18,448 in the preceding year. During the year 1919-20, 324,884,651 passengers were carried, an increase of 56,086,837 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 in 1919-20 :—

NEW SOUTH WALES.—PARTICULARS OF WORKING OF VARIOUS GOVERNMENT TRAMWAYS, 1919-20.

Line.	Mileage Open for Traffic.		Total Cost of Construction and Equipment.	Gross Revenue.	Working Expenses.	Net Earnings. (*a*)	Interest.	Profit or Loss.(*a*)	Percentage of Working Expenses on Gross Revenue.	Percentage of Net Earnings on Capital Cost.(*a*)
	Route.	Track.								
	Miles.	Miles.	£	£	£	£	£	£	%	%
Sydney and Suburban—										
Electric	155.35	276.14	7,842,549	2,676,748	2,246,674	+ 430,074	363,933	+ 66,141	83.93	+ 5.49
Steam	8.19	9.61	51,711	17,544	22,658	— 5,114	2,423	— 7,537	129.15	— 9.89
Total	163.54	285.75	7,894,260	2,694,292	2,269,332	+ 424,960	366,356	+ 58,604	84.23	+ 5.38
Parramatta —Steam	6.69	6.69	39,306	11,377	12,733	— 1,356	1,842	— 3,198	119.92	— 3.45
Sutherland to Cronulla—										
Steam	7.40	7.40	52,427	15,300	13,607	+ 1,693	2,442	— 749	88.93	+ 3.23
Newcastle —Steam	34.07	44.42	655,236	144,449	157,501	— 13,052	27,448	— 40,500	109.03	— 1.99
East to West Maitland —Steam	4.06	4.06	34,966	5,784	11,394	— 5,610	1,730	— 7,340	197.00	—16.04
Broken Hill —Steam	10.05	11.44	92,353	10,596	21,554	— 10,958	4,307	— 15,265	204.16	—11.86
Total	225.81	359.76	8,768,548	2,881,798	2,486,121	+ 395,677	404,125	— 8,448	86.27	+ 4.51

(*a*) + indicates a profit; — indicates 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, 1920.

Permanent Way.	Rolling Stock.	Power-houses, Sub-stations, and Plant.	Machinery.	Workshops.	Furniture.	Store Advances Account.	Total.
£	£	£	£	£	£	£	£
4,508,008	1,830,822	1,818,227	152,618	232,481	2,392	224,000	8,768,548

The average cost per mile open was £19,964 for permanent way and £18,868 for all other charges, making a total of £38,832 per mile.

During the year 1919–20, one new extension, 0.80 mile in length, was opened for traffic.

(e) *Sydney Electric Tramways.* The current for the operation of the City and Suburban tramways is generated at the power-houses at Ultimo and White Horse Bay, which have been erected at a total cost of £1,818,227, including the cost of the sub-stations and plant. The total output of the power-houses, for both lighting and traction purposes, during the year 1919–20 was 114,124,798 kilowatt-hours, of which the direct-current supply was 73,538, and the alternating current 114,051,260 kilowatt-hours. The following table gives particulars of the working of the electric tramways for the financial years 1915–16 to 1919–20 :—

NEW SOUTH WALES.—PARTICULARS OF SYDNEY ELECTRIC TRAMWAYS, 1915–16 TO 1919–20.

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.
1916 ..	151.05	266.18	7,526,701	81,688,434	25,008,055	272,048,293
1917 ..	152.99	270.84	7,615,110	80,608,220	23,955,722	275,180,334
1918 ..	154.37	274.55	7,738,377	73,384,629	20,618,808	239,442,696
1919 ..	154.56	274.75	7,779,227	83,780,703	23,298,238	250,706,503
1920 ..	155.35	276.00	7,842,549	92,074,950	25,394,701	304,986,683

Year ended 30th June—	Gross Revenue.	Working Expenses.	Net Revenue.	Percentage of Working Expenses on Gross Revenue.	Cars in Use.	Persons Employed.
	£	£	£	%	No.	No.
1916	1,838,708	1,452,470	386,238	78.99	1,402	9,308
1917	1,853,399	1,535,423	317,976	82.84	1,398	9,295
1918	1,847,868	1,457,349	390,519	78.87	1,398	8,463
1919	2,063,055	1,673,536	389,519	81.12	1,393	8,610
1920	2,676,748	2,246,674	430,074	83.93	1,394	8,440

(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 3½ miles, where it connects with the Parramatta River steamers, conveying passengers and goods to and from Sydney. This line, the gauge of which is 4 ft. 8½ in., was opened for traffic in 1883. In 1920 the number of tram miles run was 18,200, and the number of passengers conveyed 161,496.

(iii) *Sydney Harbour Ferries.* As the ferry services on the waters of Port Jackson are mainly supplementary to the suburban railway and tramway systems, it has been thought advisable to include them here rather than under Shipping. The figures for the year 1919–20 are based on returns shewing the working of two companies for that year, and for one company in respect of the year 1918–19 as particulars are not yet available for the year under review. The returns shew that these companies had 62 boats in commission, which were licensed to carry a total of 40,371 passengers, or an average of

651 per boat and per trip. The total number of passengers carried during the year is stated as 36,600,759, an average of 100,276 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 three companies employed during the year a total of 990 persons. The gross revenue amounted to £494,789, and the expenditure to £400,621, thus giving a net revenue of £94,168. 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 are several 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 and Metropolitan Tramway Board, to which reference will be made further on. There are also four lines of electric tramways, viz. :—(*a*) St. Kilda to Brighton, belonging to the Government and under the control of the Railway Commissioners; (*b*) an electric tramway between Sandringham and Black Rock, 2.41 miles in length, which has been constructed by the Railway Department and was opened for traffic on 11th March, 1919; (*c*) Flemington Bridge to the Saltwater River and Keilor-road, owned by a private company; and the following lines controlled by the Melbourne and Metropolitan Tramways Board, viz. :—(*d*) lines connecting Prahran, Windsor, St. Kilda and Elsternwick with Glen Huntly, Caulfield, Malvern, Glenferrie and Kew, formerly controlled by the Prahran and Malvern Tramways Trust; (*e*) Prince's-bridge to Burwood; Burke-road to Boundary-road, Wattle Park; and Bridge-road, Richmond, to Power-street, formerly owned by the Hawthorn Tramways Trust; (*f*) lines from Queensberry-street, Melbourne, to Bell-street, Coburg, and Moreland-road to Baker's-road, Fawkner, formerly owned by the Melbourne, Brunswick, and Coburg Tramways Trust; (*g*) the Fitzroy, Northcote and Preston Tramway and (*h*) The Footscray Tramway. A cable tramway, 2¼ miles in length, between Clifton Hill and Preston, was owned by the Northcote municipality, but was, on 2nd February, 1920, transferred to the control of, and has since been operated by, the Melbourne and Metropolitan Tramways Board. There is a short steam tramway,* about 1 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, however, correspond to the description of private railways referred to in sub-section 1 hereof. A tramway to the Zoological Gardens, with horse traction, is operated by the Melbourne and Metropolitan Tramways Board.

(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 4½ per cent. The premiums received amounted to £55,794, making a total of £1,705,794. This amount had been expended by the end of the year 1893, when further loan expenditure ceased. Up to the 30th June, 1919, the total cost of construction and equipment of the tramways amounted to £2,078,257. The first line—that to Richmond—was opened for traffic on the 11th 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 consisted of 43.68 miles of double-track cable lines, using constantly over 90 miles of wire rope, and 4.48 miles of horse tram line. Of the latter, 1.79 miles were transferred to the Kew Council in November, 1914, and 2.06 miles to the Hawthorn Tramway Trust in January, 1916, for electrification, leaving 0.63 mile of horse tramway at Royal Park. The gauge of track is 4 feet 8½ inches. The company also had omnibuses at work for many years down to 3rd May, 1916, when the East Brunswick line of omnibuses ceased running owing to the construction of an electric tramway along the route.

* Now dismantled.

(a) *Particulars of Working.* The subjoined statement shews the tram mileage, the number of passengers carried, and the revenue and expenditure for the years 1916 to 1920 :—

MELBOURNE CABLE TRAMWAYS.(b)—PARTICULARS OF WORKING, 1916 TO 1920.

Year ended 30th June—	Mileage Open (Route).			Mileage Run during Year.				Number of Passengers Carried.			
				Tram.		Omnibus.	Total.	Tram.		Omnibus.	Total.
	Cable.	Horse.	Total.	Cable.	Horse.			Cable.	Horse.		
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	No.	No.	No.	No.
1916c	43.68	0.63	44.31	11,977,916		68,569	12,046,485	96,290,131		412,812	96,702,943
1917c	43.68	0.63	44.31	12,413,485	10,444	..	12,423,929	(a)	(a)	..	103,118,377
1918c	43.68	0.63	44.31	12,822,147	10,882	..	12,833,029	112,754,979	279,178	..	113,034,157
1919c	43.68	0.63	44.31	13,138,992	10,645	..	13,149,637	118,043,604	259,177	..	118,302,781
1920b	45.90	0.63	46.53	13,424,488	10,648	..	13,435,136	133,378,390	296,651	..	133,675,041

Year ended 30th June—	Traffic Revenue.				Working Expenses.				Percentage of Working Expenses on Revenue.	No. of Employees at end of Year.
	Tram.		Omnibus	Total.	Tram.		Omnibus.	Total.		
	Cable.	Horse.			Cable.	Horse.				
	£	£	£	£	£	£	£	£	%	No.
1916 ..	807,356		1,721	809,077	(a)		(a)	435,423	53.82	1,992
1917 ..	(a)	(a)	..	841,784	(a)	(a)	..	462,132	54.90	2,104
1918 ..	902,471	549	..	903,020	513,717	735	..	514,452	56.97	2,273
1919 ..	945,286	513	..	945,799	577,736	1,154	..	578,890	61.21	2,400
1920 ..	1,075,236	606	..	1,075,842	722,482	1,564	..	724,046	67.30	2,786

(a) Not available. (b) Inclusive of Northcote Cable Tramway from 2nd February, 1920, to 30th June, 1920. (c) Exclusive of Northcote Cable Tramway.

(b) *Transfer of Cable Trams.* 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 in respect of the rolling-stock, car-houses, and other assets handed over by it to the Tramway Board was the subject of arbitration and of an eventual appeal to the Privy Council, which upheld the award by Mr. Justice Cussen under which a sum of £335,000 with interest at 5 per cent. from the 1st July, 1916, was payable to the company.

An action by the Tramway Board against the company to recover a sum of £587,915, for alleged breaches of the terms of the lease of the cable tramways was, after several days had been spent in part hearing the case, settled out of court by agreement between the parties.

(c) *Metropolitan Tramway Board.* In a previous issue of the Year Book (see No. 12, pp. 698–9) reference was made to the *Melbourne and Metropolitan Tramways Act* 1918, and to the terms under which it was to come into operation. On 2nd July, 1919, the appointments of the chairman and other members of the Tramway Board were made by the Governor-in-Council, and it was arranged that the Board should take over control of the Melbourne Cable Tramway System and of the Royal Park Horse Tramway on the 1st November, 1919.

On the 6th January, 1920, a proclamation was made under which the Board were to assume control of the Prahran and Malvern, Hawthorn, Melbourne, Brunswick and Coburg, Fitzroy, Northcote and Preston, and Footscray Tramway Trusts on the 2nd February following, after which date the Tramway Trusts were to cease to exist. The

Board thus assumed control of all the Metropolitan tramways, with the exception of the North Melbourne Electric Tramway, which the Board has power to acquire.

(ii) *Electric Tramways.* As already mentioned, there are in Melbourne four electric tramway systems in operation, viz. :—(*a*) the St. Kilda-Brighton line, (*b*) the Sandringham-Black Rock line, (*c*) the North Melbourne tramways; and the lines controlled by the Melbourne and Metropolitan Tramways Board (previously referred to), viz. (*d*) The Prahran and Malvern Tramways; (*e*) The Hawthorn Tramways; (*f*) The Melbourne, Brunswick and Coburg Tramways; (*g*) The Fitzroy, Northcote and Preston Tramways; and (*h*) The Footscray Tramways.

(*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 between St. Kilda and Park-street, Middle Brighton, on the 7th May, 1906, and the extension to Brighton Beach was opened on the 22nd December following. The capital cost to the 30th June, 1920, exclusive of rolling stock, was £108,252, and of rolling stock £41,876, making a total of £150,128. 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, 1916 to 1920 :—

ST. KILDA-BRIGHTON ELECTRIC STREET TRAMWAY, 1916 TO 1920.

Year ended 30th June—	Mileage Open (Route).	Total Cost of Construction and Equipment	Current used for Traction Purposes.	Tram Miles Run.	Passengers Carried.	Gross Revenue.	Working Expenses	Interest.	Net Profit or Loss. (*a*)
	Miles.	£	Kilowatt-hours.	No.	No.	£	£	£	£
1916 ..	5.16	132,300	810,510	597,819	3,126,984	25,580	22,844	4,697	− 1,961
1917 ..	5.16	156,242	780,320	572,735	3,450,442	27,919	20,502	6,250	+ 1,167
1918 ..	5.16	158,986	745,853	521,525	3,854,677	31,614	23,653	6,359	+ 1,602
1919 ..	5.16	164,347	932,010	527,305	4,945,627	40,048	27,207	6,574	+ 6,267
1920 ..	5.16	(*b*)150,128	1,381,821	551,307	6,805,892	50,494	42,813	6,005	+ 1,676

(*a*) Profit is indicated by +, loss by −. (*b*) Cost of Rolling Stock for Sandringham-Black Rock electric street railway was included under this head in preceding years.

The average fare paid per passenger was 1.76 pence in 1919-20 as against 1.94 pence in 1918-19. The gross revenue in 1919-20 was 21.98 pence per passenger car mile and £4,893 per mile of single track open.

(*b*) *The Sandringham-Black Rock Line.* This line has a length of 2.41 miles and, as already mentioned, was opened for traffic on 11th March, 1919.

The capital cost to the 30th June, 1920, was £57,910. The cost of rolling-stock at 30th June, 1919, is included in that for the St. Kilda-Brighton line. The gauge of this line is 4 ft. 8½ in. The subjoined statement gives particulars of the working of this line to the 30th June, 1920:—

SANDRINGHAM-BLACK ROCK ELECTRIC STREET TRAMWAY, 1920.

Year ended 30th June—	Mileage Open (Route).	Total Cost of Construction.	Current used for Traction Purposes.	Tram Miles Run.	Passengers Carried.	Gross Revenue.	Working Expenses	Interest.	Net Profit.
	Miles.	£	Kilowatt-hours.	No.	No.	£	£	£	£
1919 ..	2.41	(*a*) 42,706	38,650	29,008	616,746	3,751	1,792	529	1,430
1920 ..	2.41	(*b*) 57,910	161,370	113,405	2,433,162	11,597	7,898	2,316	1,383

(*a*) Exclusive of Rolling Stock. (*b*) Inclusive of Rolling Stock.

(c) *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 on the 11th October, 1906. The route and track mileage for year ended 30th September, 1920, 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 3,613,997. The current used during the year for traction purposes was 800,048 kilowatt-hours, while the number of persons employed was 129.

(d) *The Prahran and Malvern Tramways.* The lines were constructed under the control of a trust, which consisted of seven members appointed from the councils of Prahran, Malvern, St. Kilda, Caulfield, Hawthorn, Kew, and Camberwell. At the 30th June, 1920, the total route mileage open was 35.02 miles, the total track mileage being 66.12 miles, and the total capital cost £903,897. 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. The first section of the lines was opened for traffic on 31st May, 1910. During the nine months ended 30th June, 1920, the current used for traction puposes was 6,046,889 kilowatt-hours, and the number of tram miles run was 2,562,499, the number of passengers carried 28,504,376, the gross revenue £203,797, and the working expenses £146,991. The number of cars in use was 100, and the number of persons employed 707.

(e) *The Hawthorn Tramways.* The first section of these tramways, that from Prince's-bridge to Power-street, Hawthorn, was opened for traffic on 6th April, 1916, and on 30th June, 1920, the route and track mileages in operation were 11.12 and 17.93 miles respectively. During the nine months ended 30th June, 1920, the current used for traction purposes was 2,206,191 kilowatt-hours, the tram miles run 776,719, the number of passengers carried 8,448,862, the gross revenue £64,598, and the working expenses £49,651. The number of cars in use was 32, the number of persons employed 201, and the capital cost £300,171.

(f) *The Melbourne, Brunswick and Coburg Tramways.* The first section of these tramways, that between Moreland-road and Bell-street, was opened for traffic on 27th April, 1916. At the 30th June, 1920, the route and track mileages open for traffic were 7.07 and 12.32 miles respectively. During the nine months ended 30th June, 1920, the current used for traction purposes was 1,310,830 kilowatt-hours, the tram miles run 547,335, the number of passengers carried 5,424,331, the gross revenue £37,623, and the working expenses £30,453. Eighteen cars were in use, the number of persons employed was 147, and the capital cost £187,755.

(g) *Fitzroy, Northcote and Preston Tramway.* This line was opened for traffic on 1st April, 1920, and at 30th June, 1920, the route and track mileage in operation were 5.82 miles and 7.73 miles respectively. During the period (three months) the current used for traction purposes was 123,456 kilowatt-hours, tram miles run 77,666, and number of passengers carried 476,183. The gross revenue was £3,365, and working expenses £3,645. Eight cars were in use, and the number of persons employed was 45. The capital cost was £137,771.

(h) *Footscray Tramway.* The construction of this line was practically completed at 30th June, 1920, but the opening for traffic was deferred until 6th September, 1921, pending the supply of electric power. The gauge is 4 ft. 8½ in. and the route and track mileage are respectively 4.73 miles and 5.31 miles. The capital cost was £111,552.

(i) *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, the gauge being 4 ft. 8½ in. During the year ended 31st December, 1920, 5,907,443 passengers were carried, the gross revenue being £56,757, and the working expenses £38,920. The number of cars in use was 55, and the number of persons employed 133.

(j) *The Geelong Electric Tramways*, which are privately owned, were opened for traffic on the 14th March, 1912, and up to the 31st August, 1920, the cost of construction and equipment, exclusive of generating plant, totalled £61,861. The system has a route and track mileage of 4.90 and 5.67 miles respectively, the gauge being 4 ft. 8½ in.

The car mileage for the year ending on the last-mentioned date was 222,225 miles, and the number of passengers carried 1,905,542. For the same period the revenue was £21,037, and the expenditure £14,837.

(*k*) *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 1916 to 1920 inclusive :—

VICTORIA.—PARTICULARS OF WORKING OF ELECTRIC TRAMWAYS, 1916 TO 1920.

Year.	Mileage Open for Traffic (Route).	Total Cost of Construction and Equipment.	Current Used for Traction Purposes.	Tram Miles Run.	Passengers Carried.	Gross Revenue.	Working Expenses.	Cars in Use.	Persons Employed.
	Miles.	£	Kilowatt-hours.	No.	No.	£	£	No.	No.
1916	83.91	1,765,854	9,553,034	5,327,895	39,928,454	288,206	206,367	235	1,009
1917	89.08	1,861,771	11,910,707	6,462,318	51,586,576	373,594	271,315	255	1,074
1918	92.17	1,939,887	13,169,343	6,775,538	57,020,726	432,921	318,163	268	1,167
1919	94.58	2,027,057	13,955,124	6,832,873	60,753,278	463,320	344,220	274	1,318
1920	105.26	2,442,746	15,758,101	7,302,713	74,359,826	553,507	418,462	294	1,554

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 42.60 route miles at the end of the year 1920. There is also a steam tramway in operation at Rockhampton having a length of 6 route miles.

(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 1917 was £1,435,414, the gauge of line being 4 ft. 8½ in. The following table gives particulars of these tramways for the calendar years 1916 to 1920 :—

QUEENSLAND.—BRISBANE ELECTRIC TRAMWAYS, PARTICULARS OF WORKING 1916 TO 1920.

Year.	Mileage Open for Traffic (Route).	Total Cost of Construction and Equipment.	Current Used for Traction Purposes.	Tram Miles Run.	Passengers Carried.	Gross Revenue.	Working Expenses.	Cars in Use.	Persons Employed.
	Miles.	£	Kilowatt-hours.	No.	No.	£	£	No.	No.
1916	40.45	1,468,906	9,272,709	4,286,802	51,029,668	364,745	216,607	172	921
1917	41.58	1,435,414	8,964,113	4,377,104	51,860,308	371,850	257,035	172	1,121
1918	41.58	(*a*)1,435,414	9,453,441	4,379,679	57,456,832	412,569	264,858	173	1,103
1919	42.60	(*a*)1,435,414	10,309,349	4,600,482	61,415,350	445,333	295,697	174	1,073
1920	42.60	(*a*)1,435,414	11,000,875	4,934,043	69,236,690	527,264	387,456	178	1,130

(*a*) Figures for 1917.

(ii) *Rockhampton Municipal Tramways.* These tramways were opened for traffic in 1909, the motive power being steam. The length of line is 6 route miles, and the gauge 3 ft. 6 in. The capital cost to 31st December, 1920, was £42,000. During the year 1,617,922 passengers were carried, the revenue being £15,437, and working expenses £15,911. The number of the staff at end of year was 48.

(iii) *Sugar-Mill Tramways.* In various parts of Queensland there are tramways used in connexion 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 the tram service in the principal streets of Adelaide and suburbs was a horse system run by various private companies. Power to acquire these lines, and to provide for their extension and management by means of a Trust, was given to the Government 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 involved, was formed in 1907, and a length of 49 route miles of horse traction tramways was purchased from the private companies for a sum of £282,582. On the 10th March, 1909, the electric car system was inaugurated on the Kensington route. At the end of July, 1920, a length of 66.03 route miles had been electrified and opened for traffic, the corresponding length of track opened being 114.00 miles, all of which are of a gauge of 4 ft. 8½ in. The cost of construction and equipment on the 31st July, 1920, was £1,793,298. The following table gives particulars of the tramways for the years ended 31st July, 1916 to 1920 :—

SOUTH AUSTRALIA.—ADELAIDE ELECTRIC TRAMWAYS, PARTICULARS OF WORKING, 1916 TO 1920.

Year.	Mileage Open for Traffic (Route).	Total Cost of Construction and Equipment.	Current Used for Traction Purposes.	Tram Miles Run.	Passengers Carried.	Gross Revenue.	Working Expenses.	Cars in Use.	Persons Employed.
	Miles.	£	Kilowatt-hours.	No.	No.	£	£	No.	No.
1916	54.42	1,486,546	9,286,910	4,719,043	43,141,885	322,759	193,965	170	1,120
1917	64.46	1,703,151	10,382,667	4,954,848	45,431,691	338,361	211,662	170	1,200
1918	65.66	1,751,943	10 758,897	5,359,776	46,466,258	414,836	250,586	174	1,099
1919	65.66	1,789,487	10,730,307	5,176,264	45,882,376	428,477	284,993	185	1,337
1920	66.03	1,793,298	11,261,046	5,407,654	50,815,848	505,303	339,166	190	1,270

There are also in South Australia 19.86 miles of Government horse tramways in country districts, worked in connexion with the railway system, of which 17.36 miles are used for passenger service, and 2.50 miles for special purposes. The subjoined statement gives various particulars of these lines:—

SOUTH AUSTRALIA.—PARTICULARS OF HORSE TRAMWAYS, 1920.

GOVERNMENT TRAMWAYS.

Particulars.	Length.	Gauge.	Nature of Traffic.
	Miles.	ft. in.	
Moonta, Moonta Bay, and Hamley Flat	(a)5.15	5 3	Passengers and goods
Gawler	(a)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 Mundoora ..	(a)10.01	3 6	Passengers and goods

(a) Included in mileage of Government railways.

6. **Western Australia.**—Apart from the electric tramways, there are in this State several tramways, amounting in all on the 30th June, 1920, to a length of 24.91 miles, which are the property of the Government. Of these, which are under the control of the Harbour and Light Department, the most important is the line between Roebourne and Cossack, constructed on a 2-ft. gauge. The length of this line is 12.50 miles, and it is worked by steam. The remaining 12.41 miles belonging to the Government are made up of several short lengths, worked by steam or horses, in connexion with the jetties at certain ports for the purpose of providing the necessary communication between such

jetties and the goods sheds or warehouses. In addition to these Government lines there are electric tramway systems at Perth, under Government control; at Kalgoorlie and Boulder City, carried on by private companies; and at Fremantle, under municipal control.

(i) *Steam and Horse Tramways.* Particulars as to the working of the Government steam or horse tramways for the year ended 30th June, 1920, shew that the capital cost of the lines to that date was £85,451, the gross revenue for the year being £8,281, and the working expenses £3,495.

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

(*a*) *The Perth Electric Tramways* were opened for traffic by a private company on the 24th September, 1899, and the system has since been extended to many of the 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, 1920, the route and track miles open for traffic were 27.25 and 36.10 miles respectively, the total cost of construction and equipment to that date being £619,874. During the year, 19,175,143 passengers were carried, the gross revenue being £187,981 and the working expenses £149,652. Eighty-three motors were in use, and the number of employees was 436. 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, 1920, there were 8.66 route and 11.55 track miles of line open for traffic, the cost of construction and equipment at that date being £103,405. This line has a gauge of 3 ft. 6 in. During the year 6,064,699 passengers were carried, the gross revenue being £53,223 and the working expenses £43,927. Twenty-one cars were in use, and the number of employees was 135.

(*c*) *The Kalgoorlie and Boulder 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 and suburbs, and in November, 1904, the last section of the Boulder system was completed. At the end of the year 1920 the total mileage of the whole system—in Kalgoorlie and Boulder—amounted to 14.75 route or 20.50 track miles, the total cost of construction and equipment being £452,318. During the year 2,082,984 passengers were carried, the gross revenue being £36,913 and the working expenses £27,466. Twenty-five motors and seven trailers were in use, and the number of employees was 58. The gauge of this line is 3 ft. 6 in.

(*d*) *The Leonora–Gwalia Tramway*, two and a quarter route miles in length, was initially a steam tramway. It was opened for traffic by electrification under municipal control on 5th October, 1908, but is now worked with a petrol motor by a private syndicate. It has a gauge of 3 ft. 6 in.

(*e*) *Particulars of Working of all Electric Tramways.* The subjoined table shews so far as returns are available, particulars of the working of all electric tramway systems in the State for the years 1916 to 1920:—

WESTERN AUSTRALIA.—PARTICULARS OF ELECTRIC TRAMWAYS, 1916 TO 1920.

Year.	Mileage Open for Traffic (Route).	Total Cost of Construction and Equipment.	Current Used for Traction Purposes.	Tram Miles Run.	Passengers Carried.	Gross Revenue.	Working Expenses.	Cars in Use.	Persons Employed.
	Miles.	£	Kilowatt-hours.	No.	No.	£	£	No.	No.
1916	52.98	1,132,169	[a]5,191,398	2,861,959	18,315,719	189,140	139,633	123	573
1917[a]	51.61	1,161,478	5,799,337	2,955,503	19,178,047	197,880	153,847	122	526
1918	50.62	1,152,417	6,118,637	3,127,284	21,218,019	215,011	169,058	130	503
1919	50.22	1,150,0 8	5,922,421	2,951,653	20,954,579	209,664	170,261	130	545
1920	50.66	1,175,597	7,724,522	3,612,417	27,322,826	278,117	221,045	136	629

(*a*) Exclusive of Leonora tramway.

(iii) *Perth Ferries.* As the Perth ferry services are mainly used for suburban passenger traffic, they are referred to in this section rather than under Shipping. Of the thirteen boats in service, four are under the control of the Western Australian Government, the other nine belonging to a private company. The number of passengers carried during the year 1919-20 was 1,109,671, the revenue and expenditure for the same period being £14,518 and £13,077 respectively, and the number of persons employed 26.

7. **Tasmania.**—(i) *Tramways.* In Hobart there is a system of electric tramways, the first line of which was opened for traffic in 1893, amounting in all to a length of 13 and 16.50 route and track miles respectively. 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 25 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 10.13 and 13.05 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 1916 to 1920 :—

TASMANIA.—PARTICULARS OF WORKING OF ELECTRIC TRAMWAYS, 1916 TO 1920.

Year.	Mileage Open for Traffic (Route).	Total Cost of Construction and Equipment.	Current Used for Traction Purposes.	Tram Miles Run.	Passengers Carried.	Gross Revenue.	Working Expenses.	Cars in Use.	Persons Employed.
	Miles.	£	Kilowatt-hours.	No.	No.	£	£	No.	No.
1916	21.95	373,812	1,576,839	1,058,979	7,963,040	73,424	46,758	60	250
1917	21.95	383,219	1,687,407	1,115,090	8,349,789	79,693	49,930	60	259
1918	22.00	389,659	1,913,720	1,192,955	9,785,155	81,918	56,103	60	253
1919	23.25	400,375	2,396,717	1,215,663	10,070,263	97,459	63,561	60	288
1920	23.13	413,060	2,192,420	1,257,911	11,961,256	112,023	83,385	63	362

There is also a tramway from Smithton to Marrawah, 27.13 miles in length, operated by the Government. Of this distance 7.60 miles are worked as a horse tram, the rest being for steam traction. In the year ended 30th June, 1920, 1,526 passengers and 22,520 tons of goods were conveyed, the number of employees being 12.

A private steam tram at Zeehan, 1.50 miles in length, is also in operation. In 1920, 7,935 tons of goods were conveyed, the number of persons employed being 4. There is also a private steam tram running from Tullah to Farrell's Siding, a distance of 7 miles. In 1918, 1,476 passengers and 3,040 tons of goods were conveyed, the number of persons employed being 4.

In addition, a private steam tramway 2 ft. 0 in. gauge, 6 miles in length joins a Government line, about 6 miles from Zeehan, running in the direction of Pieman Crossing.

(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 five boats, and also a ferry operated by the Public Works Department with two boats. In the year 1919-20 the number of passengers carried was 859,059, the revenue £14,615, the working expenses £13,465, and the number of persons employed 36.

8. **Electric Traction in Commonwealth, 1919-20.**—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 1920; and for other tramways the returns are, generally, for the financial year 1919-20.

ELECTRIC TRAMWAYS IN THE COMMONWEALTH, 1919–20.

State.	Mileage open for Traffic (Route).	Total Cost of Construction and Equipment.	Current used for Traction purposes.	Tram Miles Run.	Passengers Carried.	Gross Revenue.	Working Expenses.	Percentage of Working Expenses on Gross Revenue.	Cars, Motors and Trailers.	Persons Employed.
	Miles.	£	Kilowatt-hours.	No.	No.	£	£	%	No.	No.
N.S.W. ..	155.35	7,842,549	92,074,950	25,394,701	304,986,683	2,676,748	2,246,674	83.932	1,394	8,440
Victoria..	105.26	2,442,746	15,758,101	7,302,713	74,359,826	553,507	418,462	75.602	294	1,554
Q'land ..	42.60	a1,435,414	11,000,875	4,934,043	69,236,690	527,264	387,456	73.484	178	1,130
S. Aust. ..	66.03	1,793,298	11,261,046	5,407,654	50,815,848	505,303	339,166	67.121	190	1,270
W. Aust.	50.66	1,175,597	7,724,522	3,612,417	27,322,826	278,117	221,045	79.479	136	629
Tasmania	23.13	413,060	2,192,420	1,257,911	11,961,256	112,023	83,385	74.435	63	362
C'wealth	443.03	15,102,664	140,011,914	47,909,439	538,683,129	4,652,962	3,696,188	79.437	2,255	13,385

(a) For year 1917.

The percentage of working expenses on gross revenue for all electric tramways in the Commonwealth was 79.44, the range for the States being 67.12 in the case of South Australia and 83.93 in the case of New South Wales.

In "Transportation Bulletin No. 12," Table No. 20, will be found an analysis of the figures in the foregoing table in respect of revenue, working expenses, etc., for the year 1919–20.

In the following table particulars are shewn as to the operations of electric tramways in the Commonwealth for the period 1911 to 1920 :—

ELECTRIC TRAMWAYS IN THE COMMONWEALTH, 1911 TO 1920.

Year.	Mileage open for Traffic (Route).	Total Cost of Construction and Equipment.	Current used for Traction Purposes.	Tram Miles Run.	Passengers Carried.
	Miles.	£	Kilowatt-hours.	No.	No.
1910–11(a)	297.47	8,747,597	(c)80,804,252	(c)33,625,344	(c)312,857,166
1911–12	322.24	9,669,808	93,897,694	37,256,203	363,959,404
1912–13	345.07	11,147,493	106,967,982	41,258,696	405,480,511
1913–14	365.39	12,365,142	(b)118,894,845	44,147,626	435,058,028
1914–15	386.30	13,018,010	(b)116,567,559	42,811,891	416,798,309
1915–16	404.76	13,753,988	(b)116,569,324	43,262,753	432,327,059
1916–17(b)	421.68	14,197,194	119,352,451	43,820,585	451,586,745
1917–18	426.40	14,441,189	114,798,667	41,454,040	431,389,686
1918–19	430.87	14,581,578	127,094,621	44,075,173	449,782,349
1919–20	443.03	15,102,664	140,011,914	47,909,439	538,683,129

Year.	Gross Revenue.	Working Expenses.	Percentage of Working Expenses on Gross Revenue.	Cars, Motors and Trailers.	Persons Employed.
	£	£	%	No.	No.
1910–11(a)	(c)2,030,533	(c)1,512,473	(c)74.49	1,506	9,329
1911–12	2,345,428	1,775,927	75.72	1,628	11,063
1912–13	2,635,526	2,092,810	79.41	1,864	12,208
1913–14	2,915,272	2,239,584	76.82	2,071	12,548
1914–15	2,990,481	2,235,806	74.76	2,135	12,193
1915–16	3,076,982	2,256,130	73.32	2,162	13,181
1916–17(b)	3,214,777	2,479,212	77.12	2,177	13,475
1917–18	3,405,123	2,516,117	73.89	2,203	12,588
1918–19	3,707,307	2,832,268	76.40	2,216	13,171
1919–20	4,652,962	3,696,188	79.44	2,255	13,385

(a) Exclusive of Leonora tramway (W.A.), with exception of mileage. (b) Exclusive of Leonora tramway. (c) Exclusive of Launceston tramway.

During the ten years included in the last table the percentage of working expenses on the gross revenue of all electric tramways in the Commonwealth had a maximum of 79.44 in 1919–20 and a minimum of 73.32 in 1915–16, the average over the whole period being 76.31.