

THE TRANS-AUSTRALIAN RAILWAY A NEW ERA IN GAUGE STANDARDIZATION

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Although much of the coast line had already been explored, Australia was not formally claimed until Captain Cook landed in Botany Bay in 1770. Officially Australia began on January 26, 1788, when Captain Philip landed at Port Jackson Bay (Sydney) with a charge of 750 convicts. Within a few years, free settlers were attracted and the population began to spread out into the coastal fringe. By 1813, the Blue Mountain barrier behind Sydney had been traversed and at the time of the Gold Rush of the 1850's, much of interior New South Wales had been carved into "squatter's" runs.¹

The Gold Rush brought an influx of migrants from Britain and the already overworked gold fields of California. The surge in population can be seen in the rise from 1840 to 1850 of 138,000 people in New South Wales and over 300,000 in Victoria.² Because New South Wales could no longer act as an effective political unit with people moving farther from Sydney, new colonies were created: Tasmania in 1825, South Australia³ in 1836, Victoria in 1851, and Queensland in 1859.

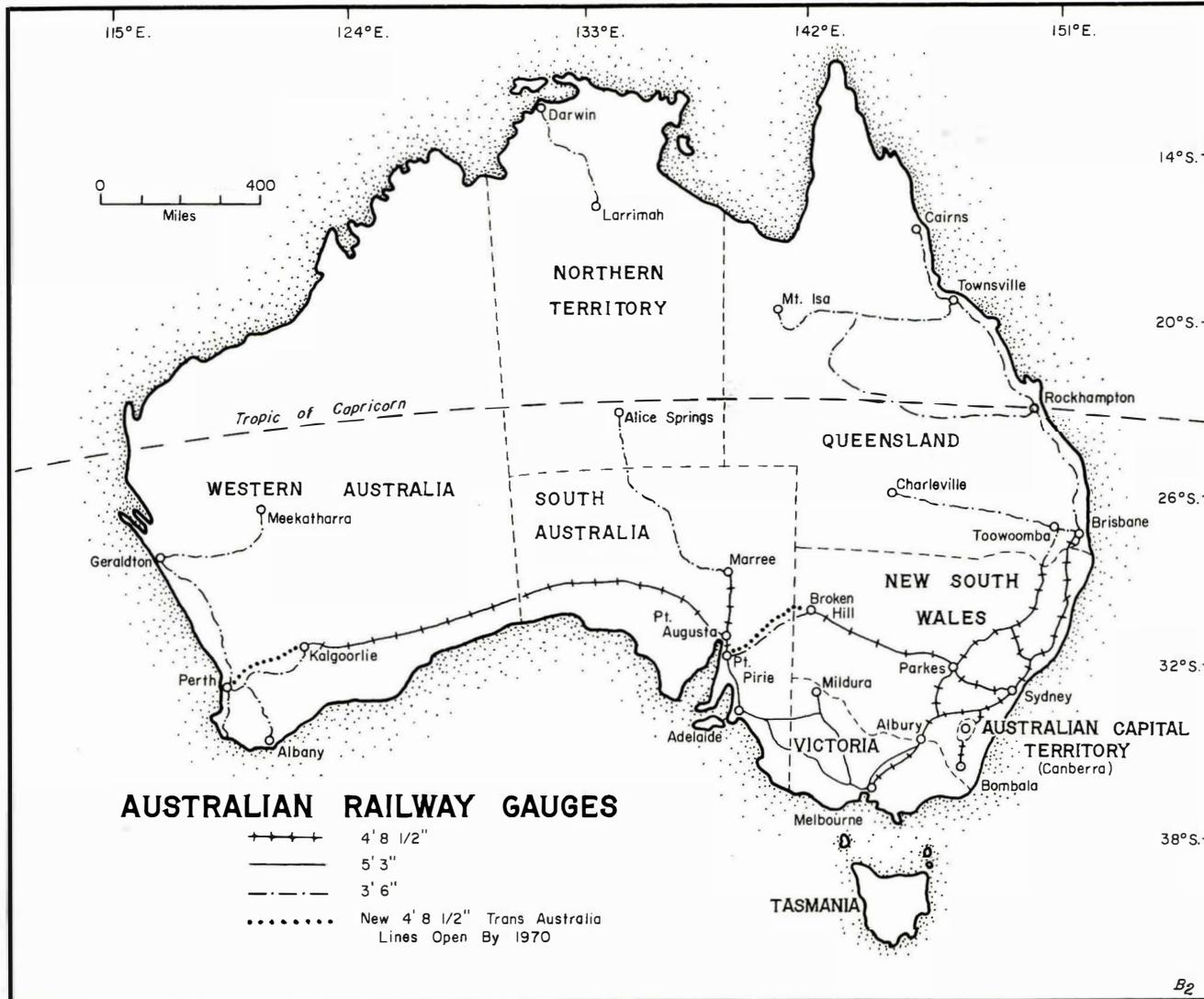
By 1850, the railroad had proved a useful means of developing the agricultural and industrial potential in Europe and North America. The colonial governments in Australia saw the need for the development of railway networks. Each colony considered itself as a separate political entity and was, in effect, a self-governing unit attempting to maximize the development of its own territory. Growth in each colony was based upon the export of raw material (wool, minerals, and, later, meat) in exchange for finished goods. Thus, the chief port and capital city became the focus of all communication, as well as the center of population, administration, and finance. The boundaries between the colonies were fringe areas between spheres of influence of each capital city. Only at a few points of contact along the River Murray did people of one colony live in proximity to the neighboring colony. Yet within the continent there was mobility as stockmen, shearers, gold seekers, and settlers moved freely from one prospect of opportunity to another. Colonial tariffs on the free flow of goods over the borders was an obstacle to economic interaction. This protective attitude was slowly compromised by the creation of the Commonwealth in 1901.

When railroad development began, the focus was upon the colonial capital. The first railway line was operated in 1854 for two miles between central Melbourne and the port. This was followed by several other small, private railways, that found it uneconomical to operate. By the end of 1855, the colonial governments took over the operation of the railways and large-scale development then began.

THE RAILWAY GAUGE MUDDLE

A railway's gauge is determined by the terrain, the population, the capital available, and the political factors influencing where rolling stock is purchased, if it is not produced at home. By 1860, there were several gauges in use: the narrow 3-foot 6-inch gauge has the advantage of low per-mile construction and operational cost in rugged areas; the standard British or European 4-foot 8½-inch gauge, which provides a longer operating span for more heavy-duty use than narrow gauge; and the Irish 5-foot 3-inch broad gauge, which was developed for heavy-duty use, higher speed, and greater operational life.

Each of the Australian colonies considered the distance and cost factors in the construction of their railway lines. Queensland sacrificed speed for a greater scope and, by using the narrow gauge, was able to extend the railway network up the coast over 1,200 miles and thus develop feeder lines into the vast interior. New South Wales and South Australia agreed to the construction of the broad gauge by 1850, and they were joined by Victoria. At the last minute, partly due to the dismissal of their chief Irish engineer, New



South Wales decided to utilize standard gauge. Victoria and South Australia had already ordered their rolling stock, as New South Wales had neglected to inform them of its decision. Western Australia did not begin development of its railways until 1881, and then decided to economize by utilizing narrow gauge.⁴ South Australia utilized narrow gauge to smaller country areas.

Thus, on the eve of federation in 1901, Australia had its railway pattern well established. Each colonial capital was a hub with the rail network radiating from it. Connection between the colonies was based upon trans-shipment of goods and passengers, resulting in innumerable delays and inconveniences; connection between South Australia and Victoria was effected easily, as both states utilized the same gauge.

Trespassing across colonial borders occurred only in a few instances to meet special needs. New South Wales had turned a deaf ear to the demands for a rail link to the mines at Broken Hill, a distance of over 700 miles from Sydney. Thus, local private interests formed the Silverton Tramway and constructed a narrow gauge line to Cockburn, 35 miles away on the South Australia border, where it linked up with that colony's narrow gauge line specially constructed from Port Pirie. This was done to facilitate the movement of Broken Hill ore.⁵ Along the River Murray border, several New South Wales agricultural centers were denied railway lines, so Victoria was granted service rights and had three lines crossing into New South Wales.

Although the states in 1921 agreed in principle to the concept of standardization, only a few key lines have seen the effect of this. In 1932, the Queensland railways standardized their portion from Brisbane to the New South Wales border, a distance of some 75 miles. In 1962, Victoria completed a standard gauge line running over 190 miles from Melbourne to Albury on the River Murray. Thus, standard gauge now exists from Melbourne over 1,200 miles to Brisbane.

THE TRANSCONTINENTAL RAILWAY

In the Governor General's speech at the federation ceremonies for the Commonwealth's establishment, reference was made to a proposed Commonwealth project to construct a rail link between Port Augusta in South Australia and Kalgoorlie in Western Australia, thus providing for an 1,108-mile link between the two closest points (Map 1). This had been one of the promises to induce Western Australia into the Commonwealth.

The chief engineers of the state railways met in conference in 1903 and recommended the use of a standard gauge line in the event of national standardization. Parliament authorized study of a route in 1907 and, in 1911, passed the Kalgoorlie to Port Augusta Railway Act, which enabled construction to begin. The route had to pass through the Nullarbor—a flat, limestone plain with less than ten inches of precipitation (Photo 1). The Nullarbor is treeless, devoid of water courses, subject to searing heat and clouds of dust. The flat topography with virtually no surface drainage made it easy to construct the line, but the lack of potable ground water, the heat and the flies of summer posed problems for the construction and maintenance crews (Photo 2). The route is the straightest in the world, with one 297-mile portion that is in perfectly straight alignment.

On October 17, 1917, the rail crews working from both ends met, and on October 22 the first passenger train rolled westward. The trip across the Nullarbor was long and dusty. Locomotive water had to be shipped to watering stops en route until 1927, when a successful treatment of ground water with barium carbonate made local water available for this purpose. Air conditioning was introduced in lounge and dining cars in 1936, but a fully air-conditioned train was not in operation until 1952.

The complete journey to or from Sydney took six days, and passengers were kept busy changing trains. For example, if one were traveling from Perth to Sydney, the first change was at Kalgoorlie from the narrow gauge to the Commonwealth standard gauge. One then changed at Port Augusta to the broad gauge, then at Adelaide to the overnight sleeper train, then again at Melbourne. A gauge change was made at Albury to the standard gauge and, at last, one would arrive in Sydney.



Figure 1. Flat limestone plain of the Nullarbor near Cook, South Australia. Note the low scrub and the lack of trees.



Figure 2. Typical railway towns housing construction and maintenance crews. This is Rawlina in western Australia.



Figure 3. Flinders Street station in Melbourne is the busiest railroad station in the nation. It is only used for suburban traffic.

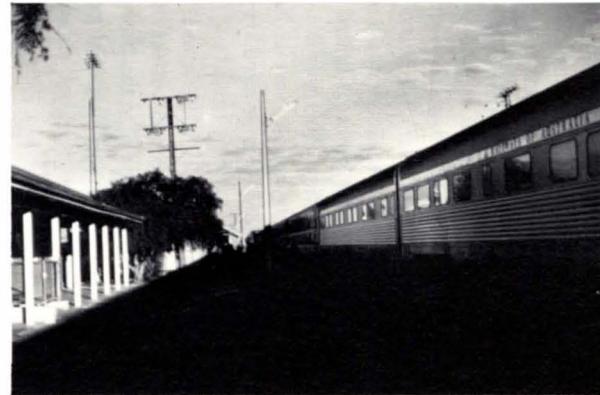


Figure 4. Modern stainless steel and aluminum sleeping cars now in use on transcontinental line.

In 1911, the Commonwealth took over completion and operation of two South Australian lines which were planned to provide a north-to-south transcontinental line. Pressure from Queensland⁶ and a lack of funds have hindered the completion of such a line. By 1929, the narrow gauge line from Port Augusta reached 800 miles to Alice Springs. The line south from Darwin was pushed 316 miles inland, leaving a gap of 622 miles. When Japan bombed Darwin in 1942, allocations were made to pave a road from the Alice Springs railhead north. Today combined rail and road transport make the expenditure of capital to complete the line impractical.

Increased traffic on the transcontinental line has resulted from growth in agricultural and mineral output and a corresponding population increase in Western Australia. In 1937, the line was extended to Port Pirie as the narrow gauge line from Broken Hill⁷ and the broad gauge line from Adelaide meet here. Improvements in service were made with the use of diesel-electric locomotives in 1951, and with new passenger cars coming into service in 1952, making this the most luxurious line in Australia. The completion of the standard gauge line between Melbourne and Albury in 1962 brought into service new overnight passenger trains between Sydney and Melbourne, thus eliminating one gauge change. The Westland Express operating between Kalgoorlie and Perth was the most uncomfortable part of the journey, as carriages did not provide private single cabins nor were toilet facilities available in each cabin. The change in gauge at Kalgoorlie was eliminated in June, 1969, by completion of the standard gauge over this route to Perth (sample timetable, Table 1).

Freight service was also improved. Victoria and South Australia allowed interchange of freight cars after 1962, and facilities for the lifting of freight cars from one gauge to another made it possible for goods to be shipped across the continent without being removed from a car.

TABLE 1
SAMPLE ONE-WAY TIMETABLE ON THE TRANS-AUSTRALIAN LINE AS OF
JULY, 1969

Station	Miles from Brisbane	Time	Gauge
Lv. Brisbane (Eastern Time)	0	4.40pm Tu	4' 8½"
Ar. Sydney	613	8.33am We	"
change trains			
Lv. Sydney	613	8.00pm We	"
Ar. Melbourne	1202	9.00am Th	
change trains			
Lv. Melbourne	1202	8.40pm Th	5' 3"
Ar. Adelaide (Central Time)	1685	9.00am Fr	
change trains			
Lv. Adelaide	1685	12.30pm Fr	"
Ar. Port Pirie	1819	3.48pm Fr	"
change trains			
Lv. Port Pirie	1819	4.45pm Fr	4' 8½"
Lv. Port Augusta	1876	6.20pm Fr	"
Lv. Tarcoola	2133	12.47am Sa	"
Lv. Cook (Western Time)	2388	6.25am Sa	"
Lv. Rawlina	2692	2.05pm Sa	"
Ar. Kalgoorlie	2927	7.45pm Sa	"
Lv. Kalgoorlie	2927	8.30pm Sa	"
Ar. Perth	3307	7.00am Su	"

AIR AND ROAD COMPETITION

Although airlines in Australia have expanded in recent years, rail passenger service is still an integral part of Australian life. The standardization of the transcontinental line and the development of newer, more comfortable trains is clear evidence that rail service for passengers and freight is not threatened by air and road competition as in the United States. Several factors explain the position of the railways:

(1) In the Australian urban centers, a network of suburban lines developed as the cities grew. Rapid, efficient, and economical service between the central city and suburban areas is an integral part of urban development (Photo 3). In 1966-67, for example, 24,583,000 passenger train miles were logged in the capital cities.⁸

(2) The national highways are either two-lane or single-lane, and road pavement is not complete in the open areas of the interior. Most roads are not suitable for high-speed traffic, and motel accommodations are at present inadequate for the number of people traveling.

(3) Air services are readily available between capital cities and to many country centers, but in light of the average Australian wage of approximately \$A50 per week, the vast majority of people utilize rail travel, as the saving is substantial (Table 2).

Air travel, road improvement, and the rise of bus and road freight services make full standardization of the nation's railways economically unrealistic. However, the demand on some routes was such that the states of Western Australia, South Australia, and New South Wales joined the Commonwealth in a program to standardize one coast-to-coast line. The Commonwealth Railway of 1,108 miles and the New South Wales line to Broken Hill were already at standard gauge, but needed many new sleepers and improved ballast. New lines had to be constructed 380 miles from Perth to Kalgoorlie, and 300 miles from Port Pirie to Broken Hill. The combined effort involved an expenditure of \$A210 million, as new rolling stock and terminal facilities were also needed. This route of 2,442 miles is the most direct from Sydney to Perth, and eliminates the detour through Melbourne and Adelaide of 252 additional miles.

The 1970's thus herald a new era in Australian railway history, a direct and continuous link between the east and west coasts. Rich iron ore from Koolyonobbing, grain from the interior of Western Australia, lead and zinc from Broken Hill, and many other products will be moved with more efficiency to ports on either coast. Passengers will also be able to relax in comfort as they cross the full width of the continent. It is expected that the increased freight and passenger revenue will offset the initial cost by early in the 1980's.

TABLE 2
Sample 1969 Air and Rail Fares—One Way Basis
(Australian dollars)

Between	Jet Coach	Rail Second Class ³	Jet First Class	Rail First Class ⁴
Adelaide and Melbourne	\$21.90	\$ 9.20	\$25.80	\$15.85
Melbourne and Sydney	23.50	11.05	28.40	18.30
Sydney and Perth	111.60 ¹	57.25	133.50	85.15
Brisbane and Perth	136.20 ²	66.75	163.70	99.40

¹ Special \$189.20 round trip excursion fares exist.

² Special \$238.40 round trip excursion fares exist.

³ Fare includes sleepers (sharing facilities) on the Trans-Australia portion only between Port Pirie and Perth. Meals are included on this portion.

⁴ Fare includes sleepers on all trains (private) on all trains except the day coach between Adelaide and Port Pirie. All meals included except on the day coach.

When the new line became fully operational early in 1970, each state and the Commonwealth took on responsibility for the operation of its respective section. Revenue will be shared on the basis of traffic over each section. The new Trans-Australian Express, already in service between Port Pirie and Perth (Photo 4), will provide through service to and from Sydney in 72 hours. Stainless steel and aluminum sleeping cars with such amenities as private showers, new lounge and dining cars make this one of the most comfortable trains this author has experienced. The trip is one of geographic interest as it impresses upon one the immensity of the "Outback." Traveling across the Nullarbor takes all of one day and the mile-after-mile of unfenced, unsettled, treeless, barren, flat and reddish land rolls by in a virtually unending panorama of monotony. The rail line across the sheer inhospitable country of the Nullarbor is, in many ways, a tribute to the pioneering spirit of the Australian people, since they have labored with much sweat to link together the two core areas of their continent nation.

REFERENCES

¹Inland development extended as far as the fourteen inch isohyet, which averages three hundred air miles inland from the coast.

²Commonwealth Bureau of Census and Statistics, *Official Year Book of the Commonwealth of Australia* (Canberra: Government Printer, 1969), p. 119.

³This colony was settled under the Wakefield scheme whereby land was sold and the money used to bring in skilled settlers. No convict settlements were ever established in South Australia.

⁴Tasmania also utilized the narrow gauge due to the rugged nature of the island.

⁵See Geoffrey Blainey, *The Rise of Broken Hill* (Melbourne: Macmillan, 1968) for a full discussion.

⁶Queensland feared that an interior north-south line would tap much of the wool and beef trade channeled via its feeder lines to the east.

⁷The narrow gauge line to Broken Hill was linked with a standard gauge line from Sydney in 1927. This allows passengers to travel through to South Australia without the detour through Melbourne.

⁸Commonwealth Bureau of Census and Statistics, *op. cit.*, p. 417. In addition, 22,728,000 train miles of country and interstate travel were recorded. Total earnings for 1966-67 were \$A509,920,000 and total operational, maintenance and depreciation costs were \$A478,921,000. After all deductions for gauge changes and other financial responsibilities the railways had a loss of \$A26,456,000. It is anticipated that increased services will eliminate the loss factor.