BRITISH RAILWAYS' ROUTE SYSTEM AND THE DISTRIBUTION OF TRAFFIC DENSITY

In 1961, British Railways had a total route mileage of 17,830 and a running track mileage of 34,150.

The route mileage was made up approximately as follows:-

No. of tracks	Route miles	Miles open for freight only
Route with four tracks or over	1,500	100
Route with three tracks	400	100
Route with double track	10,000	1,200
Single track	5,900	2,700
	17,800	4,100

The total cost of maintaining this route system and of maintaining and operating the associated signalling system, exclusive of any allocation of interest on the capital employed, is £110 m. per annum. This is the cost of providing only the route on which trains can be run, i.e. the cost of providing the signalled track.

The estimated costs per route mile and the total costs of track in the various maintenance categories are shown below. Estimates in this form can only be broad approximations, but they serve to show the high cost of even low category routes.

Maintenance category	No. of tracks	Route miles	Estimated annual costs	
			Per mile £	Total £m.
A	Triple and over	1,100	15,000	16.5
	Double	3,000	8,250	24.7
B	Triple and over	800	11,000	8.8
	Double	3,500	7,250	25.4
	Single	300	4,000	1.2
C	Double	2,500	6,250	15.6
	Single	2,100	3,500	7.3
D	Double	1,000	3,500	3.5
	Single	3,500	2,000	7.0
		17,800		£110.0m.

The total cost of providing the route system, which, it should be emphasised, excludes the costs of associated sidings, yards, stations, and depots, amounts to nearly a quarter of the railways' total revenue. This is a fixed cost, in the full sense of the term, all the while the route system remains unchanged, and its high level emphasises the necessity for matching the railway system to available traffics so as to ensure a high average level of loading. Moreover, the figures for the cost per mile of various categories of route make it clear that quite high traffic densities are necessary, even on single track route, to cover route cost alone.

The capital cost of providing sidings, yards, stations and depots is just as firmly fixed as the cost of providing route, but the cost of operating these facilities does vary to some extent with the level of traffic using them. Even so, the extent of this variation is small, especially on a short term basis, and a large part of shunting and terminal costs must be regarded as fixed, all the while the associated route system remains unchanged, or until stations are actually closed, or closed to some forms of traffic.

It is these considerations which make so interesting the information derived from the traffic density surveys, the results of which are presented more fully in Appendix 1. In what immediately follows, reference is made only to salient features, but further references are made in subsequent sections, where we return to considerations of various classes of traffic.

The traffic surveys, which were made in great detail, extended over only one week, the week ending on 23rd April, 1961, because it was impossible to continue the massive recording effort involved for a longer period. It was realised, therefore, that conclusions about some streams of traffic and about some parts of the system which are affected by seasonal changes could not be based firmly on the traffic surveys alone. Subject to this limitation, however, there can be little doubt about the general reliability of the picture revealed.

The tables and graphs in Appendix 1 show how pronounced is the disparity in loading between heavily loaded and lightly loaded parts of the route system.

One third of the route mileage carries only 1 per cent. of the total passenger miles. Similarly, one third of the mileage carries only 1 per cent. of the freight ton miles of British Railways. The lightly used part of the system includes most of the single track branch line, of which there are 5,900 miles and of which 2,700 miles are open to freight traffic only. The proportion of British Railways' total passenger and freight revenue corresponding with this proportion of total traffic movement is £4 ½ m, while the cost of providing this route is some £20 m.

One half of the total route mileage carries about 4 per cent of the total passenger miles. Similarly, one half of the mileage carries about 5 per cent. of the total freight ton miles of British Railways. The corresponding apportionment of total passenger and freight revenue is £20 m., and the estimated cost of providing this part of the track is of the order of £40 m. Therefore, in so far as it is reasonable to judge earnings in terms of the traffic movement provided, one half of the system earns far less than sufficient to cover the cost of providing route to permit the movement, with no allowance whatever for movement or other costs. By contrast, the other half of the system has earnings which cover its route costs more than six times.

It is recognised that the foregoing basis of consideration does not take account of the actual nature of the traffics on lightly loaded lines, of any special cost and charging feature associated with these traffics, nor of any contributory value which they may have to the remainder of the system. These matters will be considered later, however, and it will be found that so far from being exceptionally good traffics, most of the traffics fed to the rest of the system are of the less favourable kinds, and that their contribution of marginal revenue is small if not negative.

The disparities in the flow of traffics through stations are even more pronounced than those found in relation to routes. This is not surprising, because apart from the large variation in the

size of the stations themselves, many of the smaller ones are on routes which are also lightly loaded.

In April 1961, British Railways had about 7,000 stations open to traffic, equivalent to one for every 2 1/2 miles of route, and the distribution of stations over the route system with indications of their passenger and freight traffic levels are shown in Maps Nos. 3 and 4.

An analysis of the passenger receipts arising at passenger stations, excluding some very little used ones and unstaffed halts, was made from very complete records kept in 1960. As will be seen from Table No. 4 and Figure No. 2 in Appendix 1, one third of the stations produced less than I per cent. of the total passenger receipts and one half of the stations produced only 2 per cent. At the other end of the scale 34 stations, or less than 1 per cent. of the total, produced 26 per cent. of the receipts.

Of the freight stations, one third produced less than 1 per cent. of the station freight receipts and one half of the stations produced less than 3 per cent.

The total revenue derived from the least used half of the total number of stations and the cost of running them is set out below.

Receipts from:	*£m. per annum*
Originating passenger, parcels and other coaching train traffics at the least used 50 per cent. of all passenger stations	4.8
Freight traffic forwarded from the least used 50 per cent. of all freight stations	1.7
Estimated cost of least used 50 per cent. of all stations	9.0

From these figures, which are not highly accurate, but which are approximately correct, it will be seen that the gross revenue derived from traffic of all kinds flowing from the least used half of the total number of British Railways' stations does not match the cost of the stations themselves. In other words, it makes no contribution whatever to route costs, to movement costs, nor to terminal costs at the other end of its transit. There can be no question, therefore, that the railways would be better off financially if a high proportion of the stations were closed, even if this resulted in a total loss of the traffic passing through them.