

MANUAL OF RAILWAY STATISTICS

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Manual of railway statistics by George L. Boag

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BY

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INTRODUCTION.

IN offering this manual to railway executive officers at home and abroad, the author (who is a practical railwayman, with experience in four different countries) disclaims any pretensions to originality, but has rather endeavoured to furnish a recapitulation of the different statistical units in common use, with suggestions as to economical methods for their preparation. Opinions differ as to the merits of a control exercised by means of statistical units, some of which cannot be available until some considerable time after the period to which they relate, but, while it is admitted that no average figures can properly replace a close personal attention to daily operations, this is often quite impossible to the head of a large department, and he must have at his command some comprehensive measure of the work of his assistants. The nature of such a measure will vary with the character and scope of the railway, and it is hoped that this little work will furnish, if not the unit best suited to each particular case, some idea of how such may be compiled. More especially abroad, where there are no facilities for reference to libraries, or to friendly colleagues, the suggestions given may be useful to those who require to centralise masses of figures, which tend in detail to confuse rather than to inform. Reprints of the Report of Sir Thomas Rees Price to the Railway Congress, and the Railway Accounts Bill of 1911, are appended, and it is hoped that the reproduction of these documents in a convenient form will help towards the much-needed Standardisation of Railway Accounts and Statistics.

CHAPTER I.

THE USE OF STATISTICS.

Some form of statistical measurement of receipts has probably been used since the very beginning of railway working. With the natural growth of business, however, it became increasingly difficult to keep distinct accounts of working on different trains and sections, and a series of average figures has been gradually evolved. These averages, or statistical units, are calculated to show the results of the working of a number of trains or vehicles in a single figure which shall convey the information required without recourse to a mass of detail. A list of the wagons loaded out of a busy goods station in a day, for example, would simply form a confused row of cyphers, but the sum of all the loads divided by the number of wagons gives in one figure the kernel of the information afforded by the list. This then is a "statistical unit" (the "average starting load.") The next step, and indeed the principal use of such an average, is to compare it with the similar figure for the previous day or days. The list of wagons could not easily be so compared, even though time allowed. When an average is obtained for a number of days or months, the figure is adopted as the standard, and the energies of the executive officer will be directed towards improving on the standard.

There are still people who distrust average figures, and who prefer to work on "rough ideas," perhaps derived from something like the aforesaid list of wagons, or from a daily inspection of warehouse and yard. Control by personal observation is admittedly most efficacious, but the busy superintendent or agent cannot be outside all day and every day, and average figures are therefore indispensable. Then again, there is the old grumble of "red tape" when statistics are mentioned. As a matter of fact "red tape" is often nothing more or less than honest system, and to sneer at it betrays the casual man's dislike of order and regularity, and his fondness for "rule of thumb" methods and "rough ideas."

On the other hand, the student is warned against the indiscriminate conclusions which may be hastily drawn from a superficial inspection of statistical units. He should understand the method of their compilation, the classification of the transactions going to make up the totals on which the average figures are based, and the defects inherent in compound units composed of a number of varying factors. In a few words the statistical unit intelligently applied is a very valuable instrument, but it is necessary to exercise the greatest care in its use, and conclusions should only be drawn from the indications given by several units used concurrently.

The recent report of the Departmental Committee, appointed by the British Board of Trade to make inquiries into the form of railway accounts and statistics, is an outcome of the general feeling existing in England for some years past that the statistics published by the English railways are not sufficiently comprehensive. The Committee, in the course of its deliberations, heard and discussed evidence from many leading railway officials. One of the conclusions arrived at may be quoted: "The statistical returns at present furnished by railway companies to their shareholders under the Act of 1868 are very meagre . . . These returns do not appear to be framed upon any definite system, and the information which they contain is very incomplete." The Committee finally recommended the adoption of a uniform set of accounts and statistics, and it is to be hoped that the manifest advantages of standardisation, both in the system of statistics and in the form of accounts, will be recognised by the great English companies. The Committee was divided in opinion on the subject of the ton-mile and passenger-mile, with their corollary statistics, and it was not considered desirable to recommend the compulsory publication of these units in view of the opinion expressed by the majority of the general managers in Great Britain against their adoption. The report carries two reservations, one signed by the three representatives of the railways, dissenting from the favourable view of an extended use of statistics, expressed in the report, and the other subscribed to by Messrs. Acworth, Paish and Peel (who represented the van of the reform party), not only recommending a schedule of additional statistics, but urging the compulsory publication of ton and passenger-miles. A summary of the report is printed in the *Railway Gazette*, page 849, Volume X.

Whatever be the eventual effect of the painstaking work of the

Committee it is evident that a greater interest is now being taken in statistics, and the present work is intended to meet to some extent the demand for information as to the compilation of the statistical units which it may be confidently prophesied will become in England as generally used as they are on railways in other countries.

Perhaps no single feature of railway operation, unless it be that closely allied one of rates and fares, has given rise to more discussion than that of the use of statistical units for the control of train working. Every responsible railway officer has his own idea as to the best methods of securing economy in operation, and nearly every administration consequently prepares a different set of statistics for this purpose. In the case of State-owned or subsidised railways, such as those of India and Australia, a statutory form of statistics has been laid down, and there is a certain uniformity in the periodical figures published. The same uniformity occurs to a large extent in Continental countries, where there is a large degree of Governmental control and inspection, and in the Argentine where the form of accounts of many of the principal railways is derived from one original model. There is always however a divergence in practice and the published statistics are not invariably those used by the executive staff for the direct control of working.

Whatever system be used, the object is the same. A railway is usually said to manufacture and sell transportation, and like any other manufacturer it requires to know the cost of what it sells in order to measure its efficiency and prepare its rates. It has been said that the measure of efficiency is the amount of return produced on the capital employed, but the fallacy of this is shown by the example of a concern that is over-capitalised, requiring much larger net earnings on a given amount of business. A dividend alone therefore, however desirable, is not the only measure of economical working. In other words, it is not sufficient to impugn the management of a railway on the simple fact of its inability to produce a dividend, without taking into consideration the conditions affecting its operations; nor is it sufficient to accept as an indication of efficiency or otherwise the ratio of working expenditure to gross receipts, since the expenditure may be burdened with charges which do not arise out of the actual cost of working, such as interest on loans, reserve funds, &c. Or the administration may be bound down by inadequate maximum rates which limit receipts to a figure that cannot