

**Report of the Committee for the
Revision of Statistics on
Indian Railways,
1923.**

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NORTH WESTERN RAILWAY PRESS

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R.C.B.S.—1.

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INTRODUCTION.

(i) The question of the revision of statistics furnished by railways for inclusion in the Annual Administration Report has been under consideration for many years. During the war no officers could be spared for this duty. The unsettled period after the war still further delayed this revision.

In 1921 the Acworth Committee referred briefly to the necessity for a thorough overhauling of the statistics published in the Annual Administration Report in paras. 132 to 134 of their report.

Finally, in November 1922, a Committee consisting of Mr. W. H. Scott, Audit Department, and Major F. H. Budden, M.C., R.E., Traffic Department, were appointed. Major Budden started work on October 9th, 1922, on the collection, sorting and tabulation of information available in the files of the Railway Department. He was joined on November 8th by Mr. Scott.

(ii) The Committee's Terms of Reference are to examine —

- (a) the form and scope of the present administrative statistics embodied in the Administration Report with a view to suggest reduction and improvement ;
- (b) the form and scope of the revenue statistics and analysis of working prepared by individual lines with a view to suggest their improvement and restriction to what is found to be absolutely essential and useful for the internal control and economic working of the line ;
- (c) generally the principles at present governing the preparation of statistical information on railways in India with a view to suggest improved methods of preparation with the primary objects of effecting economy in expenditure on statistical compilation ;
- (d) the question of preparation of trade statistics at present prepared for Government by railways with a view to avoid as far as possible special compilation by railway agency.

(iii) It seemed to the Committee that, in dealing with that portion of their reference which concerned itself with the determination of what statistics should be kept, there were two methods of working open to them, *viz.* :—

- (1) to work on the basis of the existing statistics ; or
- (2) to start *ab initio* and, after finding out what statistics would be found useful by railways in checking the efficiency of their own working, to base their results on these figures.

(iv) As the question of economy is emphasised in their terms of reference and as it is generally agreed that the present voluminous statistics are of little use to railways for checking their own working, the latter method was selected as the only practicable one. Moreover, the Committee considered that, as a general rule, no statistics unnecessary to an Agent should ordinarily find a place in the central administration preparations. They were confirmed

In this opinion by the views expressed by the Agents of all railways during their tour. The results obtained by this method have, however, been checked against the existing statistics.

(v) The Committee then drew up statements based upon the material at their disposal, showing the figures which railways might find useful for checking the working of their departments, so that comparisons could be made with the statistics already in existence and a basis of discussion afforded with the responsible officer of each line. A draft questionnaire was also prepared for their own use. This was done at Lahore, the headquarters of the North Western Railway, as the statistics on this railway had been thoroughly overhauled since the war and the new figures introduced and the methods of compilation had been tested for over three years.

(vi) A programme of visits to all the important railways in India was then drawn up and approved of by the Railway Board. A copy of the actual itinerary of the Committee is shown in Appendix 1.

(vii) Due to the very different conditions which exist on railways, it is impossible in some cases to lay down for all railways a uniform set of figures. The Committee in such cases have merely stated the general lines on which such information should be collected. The procedure adopted by the Committee on the various railways visited has been to examine in the first place the figures already kept on those railways and to incorporate in their statements any figures which would appear to be an improvement on those already noted. Then meetings were arranged with the Heads of Departments concerned (Traffic, Locomotive, Engineering and Audit) and their opinions and criticisms recorded. Finally certain proposed figures were laid before the Agent and his opinion recorded.

(viii) The views of the operating departments were always obtained before those of the Chief Auditor. The latter was then referred to in connection with various general matters connected with the subject of compilation and for advice or suggestions as to the best methods of getting out the figures which were considered necessary by operating officers.

(ix) In some cases the Agent or Head of Department pointed out that certain figures in his opinion did not appear to be of any practical use and either suggested other figures or selected alternative figures put forward by the Committee.

In more than one case the views expressed by the Agent of a railway and his Head of Department were diametrically opposite concerning the value of the same figure.

(x) After the test of the criticisms of the various railways, the Committee have been left with a series of figures of a more or less uniform character which all railways have agreed should be kept. This is clearly a great point gained. Naturally enough there are certain differences of opinion about details. These are discussed when describing the various statistics in more detail later on. It is always open to any railway to keep any extra statistics which it may consider advisable. It does not appear necessary, however, for all railways to be forced to keep these extra figures.

Question of compilation.

(xi) The methods employed by railways to compile their statistics were examined in every case. The question of the cost of preparation of the new figures was not raised directly as it was considered that theoretical opinions would be of little use. The number and cost of clerks employed on

statistical work on all railways were, however, obtained. The questions of cost and of methods of preparation are discussed more fully in the chapter on methods of compilation.

(xii) Two meetings were held with the Director-General of Commercial Intelligence in Calcutta at one of which the Director of Statistics was present. A further meeting with the Director-General of Commercial Intelligence was also held at Lahore. In addition a meeting was held with the Under-Secretary to the Industries Department, United Provinces Government, as this Government required more figures than most other Local Governments. The proposals of the Committee concerning trade statistics are dealt with later on in the Report. **Trade Statistics.**

(xiii) The Committee have kept in mind the necessity of limiting statistics to those which are definitely required. A statement has been prepared—Appendix 2—comparing the requirements which the Committee recommend with the figures submitted by railways in England and America. This will show that the recommendations made by the Committee are not excessive. It might be mentioned that statistics in greater detail than those sent to the Ministry of Transport are prepared by some railways in England for their own use. **Objects in view.**

There is a tendency in all countries for controlling authorities to ask for figures which are merely interesting and of little practical use. This was noticed by Major Budden while studying the organisation and statistics in force on American and English railways. Such figures have been avoided, as far as possible, by this Committee.

(xiv) The Committee decided to address themselves directly to the terms of reference. But, before these terms are individually taken up, the Report deals with certain changes in organisation as these matters are referred to in the chapters which follow. **Sequence followed in the Report.**

It was found advisable to deal with the second term of reference before the first; thus the form and scope of the revenue statistics and analysis of working prepared by individual lines are dealt with first and then the form and scope of the present administrative statistics embodied in the Administration Report. This is followed by an examination of the principles at present governing the preparations of statistical information on railways, and certain proposals are put forward for improving methods of preparation and for obtaining value for money spent. Lastly, the question of the preparation of trade statistics was examined. This completes the four terms of reference. The Report concludes with chapters dealing with special considerations and suggestions and a number of appendices in which are included certain statements and forms.

(xv) The question of the efficiency of the working of Railway Locomotive and Carriage Shops has not been considered by the Committee. Certain figures to check the work done from an operating point of view have, however, been included. **Workshop costs.**

(xvi) A meeting was held with the Director of Wagon Interchange to discuss what figures would be useful to him. It was found that the figures proposed by the Committee as suitable for the Railway Board would supply all the information he required. An account is given in Appendix 5 of the methods employed on American railways to record the movements of individual wagons. This might prove of interest not only to the Director of Wagon Interchange, but also to certain railways which either carry out this work at present or propose to do so in the future. **Director of Wagon Interchange.**

(xvii) As has been indicated in various paragraphs in the Report, Committee, owing to the restricted time at their disposal, have not been able complete their work by the preparation of detailed forms, definitions, instructions, etc. These matters will need to be attended to before revised statistics can be effectively brought into use.

(xviii) The Committee take this opportunity to acknowledge the help given them by the Agents, Heads of Departments and other officers of the railways visited. They would like to acknowledge specially the help received from L. Faquir Chand Malhan who is in charge of the compilation work on the North Western Railway where the Committee carried out most of its work.

APPENDICES.

APPENDIX I.

Itinerary of Committee for Revision of Statistics.

Date.	Place.	Railway, etc., visited.	
1st to 17th November 1922	Lahore	N. W. Railway.	
18th November 1922	Delhi	Railway Board.	
20th to 28th November 1922	Bombay	{ G. I. P. Railway and E. B. & C. I. Railway.	
30th November to 4th December 1922	Madras	M. & S. M. Railway.	
5th and 6th December 1922	Trichinopoly	S. I. Railway.	
11th to 22nd December 1922	Calcutta	E. I. Ry.	
		B. N. Ry.	
		E. B. Ry.	
		Director-General of Commercial Intelligence.	
Director of Statistics.	3rd to 8th January 1923	Rangoon	Burma Railways.
14th to 17th January 1923	Chittagong	Assam-Bengal Railway.	
19th and 20th January 1923	Calcutta	Martin & Co.	
		MacLeod & Co.	
		Gillanders, Arbuthnot & Co.	
22nd January 1923	Allahabad	Department of Industries, U. P. Government.	
24th to 27th January 1923	Gorakhpur	B. & N.-W. Railway.	
29th to 31st January 1923	Lucknow	O. & R. Railway.	
2nd to 14th February 1923	Lahore	Writing report.	
15th and 16th February 1923	Delhi	Railway Board.	
17th to 28th February 1923	Lahore	Writing report.	
March 1923	Do	Do do.	

APPENDIX 2.
A Comparison with Statistics produced in England and America.
Passenger Statistics.

Ministry of Transport.	Interstate Commerce Commission.	Railway Board.
<p>REVENUE STATISTICS—</p> <p>Number of passengers originating (Excluding season ticket-holders) under full fares, reduced fares and total — Showing percentage of total and receipts per passenger journey under each head. Reduced fares sub-divided under — " Excursion and week-end ". Workmen. Other descriptions.</p> <p>Number of passenger journeys —</p> <p>Percentage of total, Passenger receipts, Receipts per passenger journey, under first, second and third classes and workmen separately (Excluding season ticket-holders).</p> <p>Season tickets —</p> <p>Receipts from tickets issued during month— At full fares. At reduced fares under — Traders' tickets. Other descriptions. Receipts under first, second and third classes separately. Parcels and miscellaneous traffic charged at passenger train rates under 20 heads showing — Numbers. Gross receipts. Average per unit.</p> <p>TRAIN MILES—</p> <p>Loaded ... } Empty ... } For week days and Engine and brake ... } Sundays separately Total ... } and for total.</p> <p>SHUNTING MILES—</p> <p>Shunting engines ... } Train engines ... } For week days and Other steam and } Sundays separately electric traction. } and for total.</p> <p>ENGINE MILES—</p> <p>Assisting required... } Assisting not } required. } Light ... } Total " Other " miles } For week days and (Excluding depart- } Sundays separately mental). } and for total.</p> <p>Departmental engine miles — By departments } For week days and (Includes coach- } Sundays separately ing and freight). } and for total.</p> <p>Total engine-miles — Steam, tender and } tank engines. } Electric engines — } Steam, petrol, etc., } Coaching and freight rail motors. } separately. Electric motor } vehicles. } All Traction — Coaching. Freight. Departmental. Grand Total.</p>	<p>REVENUE STATISTICS—</p> <p>Number of revenue passengers carried —</p> <p>Commutation. All others. • Total.</p> <p>Passenger revenue —</p> <p>Commutation. All others. Total.</p> <p>Number of revenue passengers carried one mile —</p> <p>Commutation. All others. Total.</p> <p>Revenue per passenger. Miles per passenger. Revenue per passenger mile. Revenue passengers per train. Revenue passengers per car. Passenger service train, revenue per train mile. Passenger service train, revenue per mile of road. Passenger miles, revenue per mile of road. Passenger revenue per car mile.</p> <p>TRAIN MILES—</p> <p>Passenger. Mixed. Special.</p> <p>Passenger train miles —</p> <p>Mixed train miles } Special train miles } Per mile of road and per locomotive mile.</p> <p>.....</p> <p>LOCOMOTIVE MILES—</p> <p>Principal, Helper, Light, Total, under passenger, mixed train and special separately. Train switching. Yard switching.</p>	<p>REVENUE STATISTICS—</p> <p>Number of revenue passengers originating by classes.</p> <p>Number of and total earnings from revenue passengers carried by classes.</p> <p>Number of revenue passengers carried one mile by classes.</p> <p>Total parcel earnings.</p> <p>Total miscellaneous coaching earnings.</p> <p>Total coaching earnings.</p> <p>Earnings per passenger.</p> <p>Earnings per passenger mile.</p> <p>Miles per passenger.</p> <p>TRAIN MILES—</p> <p>Passenger. Mixed. Total passenger and proportion of mixed.</p> <p>SHUNTING MILES—</p> <p>Shunting engine. Train engines. Total.</p> <p>ENGINE MILES—</p> <p>Assisting required. Assisting not required. Light. Total " Other ".</p>

APPENDIX 2—contd.
Passenger Statistics—concl.

Ministry of Transport.	Interstate Commerce Commission.	Railway Board.
<p>ENGINE HOURS " IN TRAFFIC "—</p> <p>Train hours ... Shunting hours ... Other hours (Excluding departmental). Departmental hours } Week days, Sundays and total. Total engine hours (including departmental).</p> <p>Steam, tender and tank engines. Electric engines. Steam, petrol, etc., rail motors. Electric motor vehicles. Total engine hours (including departmental). Coaching. Freight. Departmental. Grand Total:</p> <p>AVERAGES, ETC.—</p> <p>Train miles per train hour, Train miles per engine hour under Steam engines, rail motors, electric locomotives, electric motor vehicles and total. Shunting miles per 100 train miles. Assisting required miles per 100 train miles. Assisting not required miles per 100 train miles. Light miles per 100 train miles.</p> <p>Coal consumed—</p> <p>Lbs. per engine mile. Lubricating oil used— Pints per 100 engine miles.</p>	<p>.....</p> <p>AVERAGES, ETC.—</p> <p>.....</p> <p>Net tons of coal consumed. Lbs. per passenger train car mile.</p> <p>Passenger train car miles — Passenger cars. Sleeping, parlour and observation cars. Dining car. Other passenger train cars. Total passenger train cars. Passenger cars per train. Passenger train cars per train. Average miles of road operated. Average miles of all tracks operated.</p> <p>Car miles — Freight loaded, Freight empty, Caboose, Passenger, Sleeper, parlour and observation, Dining, Other passenger cars, Total, under mixed and special trains separately.</p> <p>Car miles per mile of road. Cars per train under passenger and mixed separately. Car miles per locomotive mile under passenger, mixed and special separately.</p>	<p>ENGINE HOURS—</p> <p>Passenger train. Mixed train. Shunting. " Others ".</p> <p>AVERAGES, ETC.—</p> <p>Train miles per train engine hour. Train miles per engine hour (Passenger with proportion of mixed). Shunting miles per 100 train miles. Light engine miles per 100 train miles. Net tons of coal consumed (Passenger and mixed). Lbs. per engine mile. Net pints of oil consumed. Pints per 100 engine miles.</p>

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**APPENDIX 2—contd.
Goods Statistics.**

Ministry of Transport.	Interstate Commerce Commission.	Railway Board.
<p>REVENUE STATISTICS—</p> <p>Number of tons and net ton miles of freight traffic under —</p> <p>General merchandise (Including live-stock),</p> <p>Coal, coke and patent fuel, Other minerals, Total,</p> <p>showing figures for both, including free hauled and excluding free hauled.</p> <p>Average length of haul.</p> <p>Total freight train receipts (Excluding cost of collection and delivery).</p> <p>Receipts per ton. Receipts per ton miles of freight traffic under—</p> <p>General merchandise (Including live-stock),</p> <p>Coal, coke and patent fuel, Other minerals, Total,</p> <p>showing average length of haul for freight, including free hauled and excluding free hauled.</p> <p>Ton and receipts per ton for 72 principal commodities.</p> <p>TRAIN MILES—</p> <p>Loaded ... } Week days and Sun- Empty ... } days separately and Engine brake ... } total. Total ... }</p> <p>SHUNTING MILES—</p> <p>Shunting miles ... } Train engines ... } Week days and Sun- Other steam and } days separately and electric traction, } total. Total ... }</p> <p>ENGINE MILES—</p> <p>Assisting required } miles. } Assisting not requir- } ed miles. } Week days and Sun- Light miles. } days separately and Total "Other" miles } (Excluding depart- } mental). }</p> <p>Total departmental miles... Week days and Sun- days separately.</p> <p>Total engine miles—</p> <p>Steam, tender and tank engines.</p> <p>Electric engines.</p> <p>Steam, petrol, etc., rail motors.</p> <p>Electric motor vehicles.</p> <p>Total.</p>	<p>REVENUE STATISTICS—</p> <p>Number of tons carried—</p> <p>Revenue. Non-revenue. Total.</p> <p>Ton miles —</p> <p>Revenue. Non-revenue. Total.</p> <p>Freight revenue. Revenue per ton. Revenue per ton mile.</p> <p>Miles hauled — Revenue freight. Non-revenue freight. All freight.</p> <p>Gross ton miles, including locomotives and tenders. Gross ton miles, excluding locomotives and tenders. Freight revenue per train mile. Freight revenue per mile of road. Freight revenue per loaded car mile. Ton miles revenue freight car mile. Ton miles all freight car mile. Revenue freight originating on respondent's road. Revenue freight received from connecting carriers.</p> <p>Total —</p> <p>showing number of car loads and tons every quarter under 70 commodities.</p> <p>TRAIN MILES—</p> <p>Ordinary: Light. Total. Work service.</p> <p>Freight train miles per mile of road. Work train miles per mile of road. Freight train miles per locomotive mile.</p> <p>LOCOMOTIVE MILES—</p> <p>Yard switching.</p> <p>Work service Principal. Helper. Light. Total.</p> <p>Locomotive miles, transportation per mile of road.</p>	<p>REVENUE STATISTICS—</p> <p>Number of tons forwarded.</p> <p>Number of tons carried.</p> <p>Net ton miles.</p> <p>Average haul.</p> <p>Total earnings.</p> <p>Total other goods earnings.</p> <p>Total goods earnings.</p> <p>Earnings per ton.</p> <p>Earning per mile.</p> <p>Tons originating over home line, whether local or foreign.</p> <p>Tons of other traffic.</p> <p>Total tons carried.</p> <p>Total earnings under 25 commodities.</p> <p>TRAIN MILES—</p> <p>SHUNTING MILES—</p> <p>Shunting engines.</p> <p>Train engines.</p> <p>ENGINE MILES—</p> <p>Assisting required.</p> <p>Assisting not required.</p> <p>Light.</p> <p>Total "Other".</p> <p>Siding.</p> <p>Departmental.</p>

APPENDIX 2—concl.

Goods Statistics—concl.

Ministry of Transport.	Interstate Commerce Commission.	Railway Board.
<p>Wagon miles per train engine hour ...</p> <p>Wagon miles per shunting hour ...</p> <p>Wagon miles per engine hour ...</p> <p>Average number of miles run per wagon per week — Loaded. Empty. Total.</p> <p>Average time per day wagons were — in transit. Shunting, standing under and awaiting repair.</p> <p>Coal consumed, steam locomotive — Lbs. per engine mile, goods service. Coal consumed, shunting, by shunting engines.</p> <p>Lubricating oil used, steam locomotives — Pints per 100 engine miles, goods service. Pints per 100 engine miles, shunting by shunting engines.</p>	<p>Car miles work service.</p> <p>Car miles per mile of road.</p> <p>Cars per train — Loaded, Empty. under freight and mixed separately.</p> <p>Car miles per car day.</p> <p>Net ton of coal consumed.</p> <p>Lbs. of coal per 1,000 gross ton miles (Including locomotive and tenders).</p> <p>.....</p> <p>.....</p> <p>Average number of freight cars on line daily—</p> <p>Serviceable, home. Serviceable, foreign. Serviceable, total.</p> <p>Unserviceable, home. Unserviceable, foreign. Unserviceable, total. Grand total serviceable and unserviceable.</p> <p>Total home. Total foreign.</p> <p>Number of cars stored. Number of owned cars.</p> <p>Per cent unserviceable of total cars on line. Per cent of owned cars on line. Per cent cars on line of total owned cars.</p>	<p>Wagon miles per shunting engine hour.</p> <p>Wagon-miles per engine hour.</p> <p>Wagon-miles per wagon day.</p> <p>Net tons of coal consumed—</p> <p>Lbs. of coal per engine mile. Lbs. of coal per 1,000 gross ton miles.</p> <p>Total pints of lubricating oil consumed. Pints per 100 engine miles.</p> <p>Wagons —</p> <p>Number owned. Average number on line daily. Per cent unserviceable to average number on line daily.</p>
<p>Steam and electric locomotives, steam and petrol rail motors (Shown separately)—</p> <p>(a) Average number in stock.</p> <p>(b) Average stock available for use— Number per cent of stock.</p> <p>(c) Average number in use (All services)— Number per cent of stock, per cent of average number available.</p> <p>(d) Maximum number in use (All services) on any one day, number per cent of stock, per cent of average number available.</p> <p>(e) Engine hours in traffic per day — Per engine in stock. Per engine in use.</p> <p>(f) Engine miles per day — Per engine in stock. Per engine in use.</p>	<p>ROLLING-STOCK STATISTICS —</p> <p>Locomotives, serviceable.</p> <p>Locomotives, unserviceable.</p> <p>Locomotives, stored.</p> <p>Locomotives, total on line daily.</p> <p>Per cent unserviceable of total locomotives.</p> <p>Miles per locomotive day.</p>	<p>Locomotives —</p> <p>(a) Average number in stock.</p> <p>(b) Average number under or awaiting repair per cent of stock.</p> <p>(c) Average number available for use per cent of stock.</p> <p>(d) Average number in good repair stored.</p> <p>(e) Average number in use daily on—</p> <p>Ordinary passenger service (Including mixed). Special service. Goods service. Departmental service. Shunting. Total.</p> <p>(f) Maximum number in use on any one day.</p> <p>Engine miles per passenger engine used per day.</p> <p>Engine miles per goods engine used per day.</p> <p>Engins miles per day per engine in use.</p> <p>Engine miles per day per engine in stock.</p>

DDX 3.

from _____ to _____ during 19 .

REMARKS.

Summary of the Running of Passenger Trains ending 19 District, for the period

1	No. of train.			23	
	2	3	4		
	10 minutes and under.	NUMBER OF TRAINS STARTED.			
	From 11 minutes to 80 minutes.				
	Over 80 minutes.				
	10 minutes and under.	NUMBER OF TRAINS ARRIVAL.			
	From 11 minutes to 80 minutes.				
	Over 80 minutes.				
	10 minutes and under.	NUMBER OF TRAINS LOSING TIME.			
	From 11 minutes to 80 minutes.				
	Over 80 minutes.				
	Locomotive Department.	TIME LOST BY			
	Carriage & Wagon Department.				
	Engineering Department.				
	Station work and shunting at stations.				
	Crossing trains.				
	Waiting connections.				
	Accidents.				
	Other Traffic delays.				
	Traffic Department.		TIME MADE UP BY		
	Locomotive Department.				
	Number of times trains ran.				
	Number of times trains did not lose time.				
	REMARKS.				

APPENDIX 3—contd.

Statement of Goods Train Running.

Section. _____ *Miles.* _____

Date.	No. of train.	Time-table time.	Actual time.	MAXIMUM LOAD OF TRAIN IN VEHICLES.			Load of engine in vehicles.	REMARKS.
				Loaded.	Empty.	TOTAL.		

All the goods trains run on any one section will be entered one below the other, up and down separately. The figures for all the trains run on any one day will then be added up and the totals entered daily in the second ledger—Daily Summary of Goods Train Running.

APPENDIX 4.

Monthly Reports to be submitted to the Railway Board.

Statement (1)—Passenger Train Performance.

(Full name of reporting railway.)

For month ending _____ 19 _____ compared with month ending _____ 19 _____

1. *Train miles* —

Passenger.

Mixed.

Total (Passenger and proportion of mixed train miles).

2. *Shunting miles* —

Shunting engines.

Train engines.

Total.

3. *Engine miles* —

Assisting not required }
Assisting required ... } = "Other".
Light ... }

Total "Other".

4. *Engine hours* —

Passenger train.

Mixed train.

Shunting.

5. *Average speed* (Passenger with proportion of mixed included) —

Train miles per train engine hour.

Train miles per engine hour.

Shunting —

Shunting miles per 100 train miles.

Light running —

Light engine miles per 100 train miles.

Coal consumed —

Total net tons (Passenger and mixed).

Lbs. per engine mile (Passenger and mixed).

Lubricating oil consumed —

Total pints (Passenger and mixed).

Pints per 100 engine miles (Passenger and mixed).

APPENDIX 4—contd.
Statement (2)—Goods Train Performance.

(Full name of reporting railway.)

For month of _____ 19____ compared with _____ 19____

1. *Train miles* —
 - Proportion of mixed train miles.
 - Total.
2. *Shunting miles* —
 - By shunting engines,
 - By train engines.
 - Total.
3. *Engine miles* —
 - Assisting required ...
 - Assisting not required ... } = "Other".
 - Light ...
 - Total "Other".
 - Siding.
 - Departmental.
4. *Engine hours* —
 - Train.
 - Shunting.
 - "Other."
 - Siding.
 - Departmental.
 - Total.
5. *Wagon miles* —
 - Loaded.
 - Empty.
 - Total.
 - Percentage loaded of total.
6. *Average speed*—
 - Train miles per train hour.
 - Train miles per engine hour.
7. *Average wagon load* —
 - Net ton miles per loaded wagon mile.
8. *Average train load* —
 - Wagons per train.
 - Loaded.
 - Empty.
 - Total.
 - Net ton miles per goods train mile.
 - Gross ton miles per goods train mile.
9. *Wagon user* —
 - Wagon miles per wagon day.
 - Net ton miles per wagon day.
10. *Locomotive user* —
 - Net ton miles per locomotive day.
11. *Shunting* —
 - Wagon miles per shunting engine hour.
 - Net ton miles per shunting engine hour.
 - Shunting engine miles per 100 train miles.
12. *Light running* —
 - Light engine miles per 100 train miles.
13. *Efficiency* —
 - Wagon miles per engine hour.
 - Net ton miles per engine hour.
 - Gross ton-miles per engine hour.
14. *Coal consumed* —
 - Tons.
 - Lbs. per engine mile.
 - Lbs. per 1,000 gross ton miles.
15. *Lubricating oil consumed* —
 - Total pints.
 - Pints per 100 engine miles.
16. *Density (Passenger and goods)* —
 - Passenger miles per running track mile per day.
 - Net ton miles per running track mile per day.

APPENDIX 4—contd.

Statement (3)—Rolling-Stock performance.

(Full name of reporting railway.)

For month ending _____ 19____, compared with month ending _____ 19____

Locomotives—

- (a) Average number in stock.
- (b) Average number under or awaiting repair.
Per cent of stock.
- (c) Average number available for use.
Per cent of stock.
- (d) Average number in good repair stored.
- (e) Average number in use daily on_____
Ordinary passenger service (including mixed.)
Special service.
Goods service.
Departmental service.
Shunting.
Total.
- (f) Maximum number in use on any one day.
Engine miles per passenger engine used per day.
Engine miles per goods engine used per day.
Engine miles per day per engine in use.
Engine miles per day per engine in stock.

Wagons—

- Number of wagons owned.
- Average number of wagons on the line daily.
- Per cent unserviceable to average number of wagons on line daily.

APPENDIX 4—contd.
Statement (4)—Revenue and Expenditure.

REVENUE.

1. Average route miles operated.
2. Average track miles operated (excluding sidings).
3. *Passenger*—
 - Number of all passengers originating by classes.
 - Number of and total earnings from all passengers carried by classes.
 - Total parcel earnings.
 - Total miscellaneous coaching earnings.
 - Total coaching earnings.
4. *Goods*—
 - Number of tons forwarded.
 - Number of tons carried, net ton miles, average haul and total earnings from tons carried.
 - Total other goods earnings.
 - Total goods earnings.
 - Total gross earnings.

EXPENDITURE.

- | 5. Engineering Department | Percentage of Total
Expenditure. | Percentage of Gross
Earnings. |
|-----------------------------|-------------------------------------|----------------------------------|
| Locomotive Department | ... Do do. | Do do. |
| Carriage & Wagon Department | Do do. | Do do. |
| Traffic Department | ... Do do. | Do do. |
| General | ... Do do. | Do do. |
| Steam Boat | ... Do do. | Do do. |
| Special and Miscellaneous | ... Do do. | Do do. |
6. Total working expenses.
 7. Percentage of working expenses to gross earnings.
 8. Average earnings per passenger carried.
 9. Average earnings per passenger mile.
 10. Average cost per passenger mile.
 11. Miles per passenger.
 12. Average earnings per ton carried.
 13. Average earnings per ton mile.
 14. Average cost per ton mile.
 15. Miles per revenue ton.
 16. Passenger earnings per passenger train mile.
 17. Passenger costs per passenger train mile.
 18. Goods earnings per goods train mile.
 19. Goods costs per goods train mile.

APPENDIX 4—concl'd.

Statement (5)—Commodities recommended by Committee.

Names of commodities.	AVERAGE	
	Tons.	Earnings.
1. Coal and coke	20,632,098	7,80,73,334
2. Cotton, raw	1,341,145	2,82,44,950
3. Do, manufactured	691,364	1,53,26,958
4. Fodder	1,328,028	89,08,383
5. Fruits and vegetables, fresh	867,532	55,92,076
6. Rice in the husk	1,412,109	64,64,079
7. Rice not in the husk	3,825,085	2,85,46,167
8. Gram and pulse	2,671,758	2,12,36,760
9. Wheat	2,370,791	1,92,49,265
10. Jowar and bajra	1,021,646	77,70,609
11. Other grains and pulses	5,301,352	4,05,77,432
12. Jute, raw	1,307,566	1,03,08,848
13. Iron and steel, wrought	686,850	79,53,252
14. Marble and stone	2,687,014	63,37,347
15. Kerosine oil	999,322	1,14,08,190
16. Oil-seeds	2,474,036	2,04,57,859
17. Tobacco	387,300	44,87,500
18. Provisions	831,797	93,07,224
19. Salt	2,340,094	1,55,83,789
20. Sugar, refined and unrefined	812,113	99,69,297
21. Gur, jagree, molasses, etc.	1,173,037	92,73,641
22. Wood, unwrought	2,187,768	96,15,633
23. Metallic ores	1,572,211	62,48,804
24. Railway materials	521,145	23,35,880
25. Other commodities ... ..	...	...

APPENDIX 5.

A Method of Recording the Movement of Cars.

The following method of recording the movement of individual cars in America has taken the place of the card-index system which formerly was used for this purpose. The new method is cheaper, more rapid and on the whole more accurate. Any method which is employed for this purpose must allow of accuracy and speed as the charges for the hire of cars are based on these records, and large numbers of cars have to be dealt with on certain systems. For example, the Pennsylvania System owns over a quarter of a million cars.

This new method is based on wheel reports, or vehicle summaries as they are called in India. These wheel reports are bound in books, and as many copies as are necessary are made out at one time by the use of carbon paper. From the copies of a wheel report attached it will be seen that the wheel report consists of a heading and a number of slips which are ruled alike and are joined together. On each slip are entered the details of one car. Each slip is numbered serially so that it can be seen at once how many cars have been entered on one page. It will be noticed that some of the pages are wider and contain more headings for recording information than others. Also each of the slips on the half-pages has a hole punched near the left end, the reason for which will be explained later. One copy of the full-page and one copy of the half-page is sent to a central office which is in charge of an officer who is usually called the Superintendent in charge of the Car Service Division. The wheel report (half-page size) is cut up in a cutting machine into separate slips and these slips are weighed out to girls who sort them into a number of groups, depending on the number of ledgers kept. The number of ledgers necessary depends on the number of slips a girl can post in one ledger. The girls who sort the slips stand or sit before a board on which are a number of nails and the slips are sorted by placing the slip, which has a hole punched near one end, on to its right nail. As soon as the slips have been sorted, they are again weighed out to the girls who have to post them. On each page of a ledger are entered the individual numbers of a large number of cars one below the other and the movements of a particular car during the month are shown across the page which is ruled with columns corresponding to the number of days in the month. Movements to and from the home line are shown in blue and movements of home cars between foreign lines in red, while the remainder are shown in pencil. Empty movement is marked with a tick. This is also done for all foreign line cars on the home line and home line cars on foreign lines. At the end of any period the loaded and empty mileage of cars is shown by divisions in both directions, as well as totals for the whole line, etc. From this record, the *per diem* charges for all foreign line cars are worked out and the charges received from foreign lines checked. Foreign lines and private owners are sent a copy of the slip showing the movements of their own cars off and on the home line. This system has superseded all other systems, such as the card-index, for large lines.

The second copy of the wheel report (full-page size) is used for working out tonnage figures, etc. Different coloured forms are used for the movements of cars when travelling on the home line and when coming off or on to the line.

It is found that girls are far better at sorting the slips than men, but at posting there is not much difference. Some girls can sort as many as 15,000 slips in eight hours, which works out at the remarkable average of 31 slips a minute. The number of slips that go to one ounce are checked at intervals; so this method of counting a number of small slips is sufficiently accurate, very simple and rapid.

The fact that a second copy of the wheel report is received and is not cut up would allow of a percentage check being made on the work of the clerks to ensure that entries were being correctly made.

It was stated that an American clerk could post 1,200 entries in a day of eight hours. On the assumption that an Indian clerk is 50 per cent as efficient as an American, and works only six hours a day instead of eight hours, he should be able to post 450 entries in a day of six hours. Allowance should also be made for the large number of holidays in India which reduces the average number of hours worked in a week from 33 to 30 or less when calculating the number of clerks necessary to deal with the daily movements on any one railway.

PENNSYLVANIA SYSTEM

_____ CARS IN TRAIN

_____ SHEETS

SHEET No. _____

DIVISION _____

WARD _____

192 _____

HOME
DIVISION _____

TRAIN _____

ROUTE VIA _____

CONDUCTOR _____

CABIN CAR STENCILED WEIGHT (IN TONS)	INITIALS	NUMBER	TAKEN AT	DATE	LEFT AT	DATE	TIME AT INTER-MEDIATE STATIONS		WEIGHT IN TONS		LEAVE BLANK	
							TAKEN ON	SET OFF	OF CAR (STENCILED WT.)	OF LADING		
	INITIALS	NUMBER	X TAKEN AT	DATE	LEFT AT	DATE	KIND OF CAR	TAKEN ON	SET OFF	(STENCILED WT.)	OF LADING	
1								M	M			
2								M	M			
3								M	M			
4								M	M			
5								M	M			
6								M	M			
7								M	M			
8								M	M			
9								M	M			
10								M	M			
11								M	M			
12								M	M			
13								M	M			
14								M	M			
15								M	M			
16								M	M			
17								M	M			
18								M	M			
19								M	M			
20								M	M			
21								M	M			
22								M	M			
23								M	M			
24								M	M			
25								M	M			
26								M	M			
27								M	M			
28								M	M			
29								M	M			
30								M	M			

**PENNSYLVANIA SYSTEM
FREIGHT CONDUCTOR'S REPORT**

TRAIN _____ ROUTE VIA _____

_____ Ward

From _____ at _____ M.

_____ 192 _____
(Name of month must be written)

To _____ at _____ M.

_____ 192 _____
(Name of month must be written)

Total Loaded Cars _____ Total Empty Cars _____

ENGINE			WHERE FROM	WHERE TO	NORMAL RATING IN TONS	AUTHORIZED RATING IN TONS
INITIALS	NUMBER	CLASS				

DATE AND TIME OF TRAIN PASSING TO CONNECTING DIVISION

FROM		AT	TO	
DIV.	DATE TIME		DIV.	DATE TIME

CONDUCTOR

INSTRUCTIONS.

This report must be prepared with great care, observing the following rules :-

1. Blanks C. T. 1034 and C. T. 1034A constitute one train report.

2. See that cabin car is placed in the space allotted and not in the body of the report. When using more than one sheet to report train, show cabin car on first sheet only.

3. Under the heading marked "Number" the figures must be placed between the lines provided for that purpose, the last figure in each number being placed in the right hand column.

4. DITTO MARKS MUST NOT BE USED ON THE NARROW BLANK C. T. 1034A AS EACH NUMERICAL PORTION OF THIS REPORT IS TO BE CUT INTO SLIPS AFTER BEING RECEIVED IN THE OFFICE OF THE SUPT. OF CAR SERVICE, PHILA., Pa., AND THE "INITIALS" "NUMBER", "TAKEN AT", "LEFT AT" AND "DATE" MUST BE SHOWN FOR EACH CAR SEPARATELY.

5. The exact date or dates that each car moved must be placed after each car in the space marked "Date". This is very important and must in no case be omitted.

6. Use the following abbreviations to designate loaded cars in column after the car number: A-Anthracite Coal; B-Bituminous Coal; K-Coke; X-All other kinds of lading; and use this Mark- to designate each empty car. Do not use the ditto mark in this column, but place the proper loaded or empty mark after each car number.

7. In column headed "Kind of Car" use letters given below to designate kind of car.

Passenger Equipment.

- PL-Parlor.
- DN-Dining.
- SL-Sleeper.
- OB-Observation.
- P-Passenger.
- 2P-2nd Class Passenger.
- V-Business.
- PB-Passenger-Baggage.
- PBM-Pass. Bagg. and Mail.
- PLB-Parlor-Baggage.
- BG-Baggage.
- BM-Baggage-Mail.
- PO-Postal.
- PS-Postal Storage.
- EXP-Express.
- RE-Refrigerator Exp.
- BE-Box Express.
- HC-Horse Carriage.
- EC-Emergency.

Freight Equipment.

- R-Refrigerator.
- B-Box.
- A-Automobile.
- BF-Furniture.
- DD-Double Deck Stock.
- SD-Single Deck Stock.
- G-Gondola.
- H-Hopper Gondola.
- F-Flat.
- CK-Coke.
- D-Coal Dump.
- L-Lime.
- LP-Live Poultry.
- PH-Palace Horse.
- T-Tank.
- C-Cabin.

Work Equipment.

- MC-Cabin.
- TB-Tool and Block.
- SP-Snow Plow.
- DA-Derrick.
- SW-Stone and Wood Truck.
- GD-Gravel Dump.
- MV-Ballast.

8. When any car is hauled part of a trip loaded and part empty, the initials and number of car should be repeated in proper space to show between what points it moved loaded and empty.

9. In the place marked "Taken at" and "Left at" the station abbreviations as shown in C. T. 1000, for points east of Pittsburgh & Erie and P. L. 506 for points west of Pittsburgh & Erie, must be used. The prefix and affix letters to station numbers are as much a part of the station number as the figure themselves and must be shown in all cases.

10. In the column of blank C. T. 1034 marked "Time at Intermediate Stations" the time trains left starting point and arrived at destination must not be shown. This column is intended for the insertion of time each car is taken on or set off at intermediate stations.

11. In columns on blank C. T. 1034 headed "Weight in Tons" weights must be shown in tons of 2,000 pounds. For less than car load freight, an arbitrary of 20 tons must be used for the weight of lading. For distributing locals, an arbitrary of 10 tons must be used for weight of lading. Where actual weight is not shown on car load shipments, the estimated weight must be used. Terminal and yard conductors should use an arbitrary of 20 tons for weight of lading, no distinction being made between car load and less than car load freight.

12. No information whatever is to be entered by the Conductor in the last column on blank C. T. 1034 headed "Leave Blank". This column is for the use of the Superintendent's Office and therefore must be left blank as indicated in the caption thereof.

13. Great care must be taken that the narrow blank C. T. 1034A and the wide blank C. T. 1034 for the Superintendent of Car Service are fastened together. When one report will not hold the numbers of all the cars in a train, use two or more blanks and pin C. T. 1034 and C. T. 1034A reports together so that they will reach the office of Superintendent of Car Service as one report.

14. When the initials of a road or individual company to which a car belongs are not shown in the alphabetical list of abbreviations C. T. 1000 and P. L. 506, write the name of the road or individual company with sufficient fullness to make it clear as to ownership of car.

15. The Conductor must write his signature in full and name of Home Division at the top left-hand corner of C. T. 1034A.

16. When trains move over different divisions of the Pennsylvania System, or are detoured over foreign roads, the route must be shown in full on C. T. 1034 in upper right-hand corner of this form, and when passing to connecting division fill in all information called for on the back of the same report under heading "Date and Time of Trains passing to Connecting Division".

17. After report has been completed, if Conductor finds it necessary to make a correction, he must be sure to make same on all copies of C. T. 1034 and C. T. 1034A.

18. At end of trip C. T. 1034 A together with copies of C. T. 1034 and time slip should be deposited by the Conductor at same time at place designated by the Superintendent. The first copy C. T. 1034 and C. T. 1034A (narrow sheet) reports must be enclosed in special envelope C. T. 1167, prepared for the purpose, and forwarded by first passenger train to Superintendent of Car Service, Philadelphia, Pa., and carbon copies as directed by the Superintendent. Before forwarding reports, examine carefully to see if correct in every particular. Car should be taken to fold narrow blank C. T. 1034A only once.

19. Was there an accident to your train? If so, at what point? _____

If a car is badly damaged or destroyed, show it by placing a circle around the small printed number in the initials column.

20. When freight conductors lay over at any point short of the terminal of their run to obtain rest or on account of wreck or wash-out, and the same crew continues through to the end of the run, only one report (same number of copies as above) is required with a notation on the back of same showing the cause of delay, point delayed and extent of delay. However, should a new crew handle the train to the terminal, the first conductor must complete his report to the point where he gives up the train, and the second conductor must make a new report covering the balance of the trip.

PENNSYLVANIA SYSTEM

C T. 1034A

SHEET No. _____

DIVISION _____

WARD _____ 192 _____

HOME
DIVISION

CONDUCTOR _____

CABIN CAR STENCILED WEIGHT (IN TONS)	INITIALS	NUMBER	TAKEN AT	DATE	LEFT AT	DATE	
1			X				KIND OF CAR
2			X				KIND OF CAR
3			X				KIND OF CAR
4			X				KIND OF CAR
5			X				KIND OF CAR
6			X				KIND OF CAR
7			X				KIND OF CAR
8			X				KIND OF CAR
9			X				KIND OF CAR
10			X				KIND OF CAR
11			X				KIND OF CAR
12			X				KIND OF CAR
13			X				KIND OF CAR
14			X				KIND OF CAR
15			X				KIND OF CAR
16			X				KIND OF CAR
17			X				KIND OF CAR
18			X				KIND OF CAR
19			X				KIND OF CAR
20			X				KIND OF CAR
21			X				KIND OF CAR
22			X				KIND OF CAR
23			X				KIND OF CAR
24			X				KIND OF CAR
25			X				KIND OF CAR
26			X				KIND OF CAR
27			X				KIND OF CAR
28			X				KIND OF CAR
29			X				KIND OF CAR
30			X				KIND OF CAR

APPENDIX 6.

Statement showing the estimated number of clerks required to compile all units entering into the Committee's proposals on the North Western Railway.

Items of work,	For the line as a whole,	By sections and districts of the line as well as for the line as a whole,	Staff at present employed,
<p>(1) (i) Train miles by classes (Work and through trains in case of goods separate). (ii) Wagon miles by classes (Work and through trains separate) ... (iii) Coaching vehicle miles without distinction of classes ... (iv) Train hours by classes ... (v) Engine miles by classes ... (vi) Engine hours by classes ... (vii) Capacity miles ... (viii) Goods tare miles ... (ix) Seat miles (Third class only) based directly on guards' reports ... (x) Coaching tare miles based directly on guards' reports ... (xi) Calculation of other units as the result of combination of above units along with others, as required by the Committee.</p>	38	34	38
<p>(2) (i) Tons forwarded by limited classes ... (ii) Tons carried by 10 classes ... (iii) Tons received ... (iv) Net ton miles ... (v) Commodity ton miles by 10 selected commodities ... (vi) Traffic under 25 heads of commodities [including 10 <i>vide</i> items (i) and (v)], showing weight and earnings for Capital & Revenue Accounts and Administration Report, and showing tons under two heads, <i>viz.</i> (1) tons originating on the North Western Railway, and (2) others, respectively. (vii) Earnings by commodities carried ... (viii) Calculation of other units as the result of combination of above units along with others, as required by the Committee.</p>	44	45	51
<p>(3) (i) Passengers forwarded by classes ... (ii) Passengers carried by classes ... (iii) Passenger miles ... (iv) Passenger earnings by classes ...</p>	26	27	28
<p>(4) Compilation monthly pamphlet of operating statistics, density graphs and diagrams, etc.</p>	3	3	3
<p><i>Add</i>—One assistant superintendent and one sub-head working as assistant superintendent.</p>	2	2	2
TOTAL ...	104	111	120
Alternative No. 1			
<p>If coaching gross ton miles and seat miles are eliminated and other units remain, as indicated above against items 1 to 4, there will be a further reduction of one clerk, and the strength of the section will be ...</p>	107	...	120
Alternative No. 2.			
<p>If the number of passengers forwarded are calculated, but passenger-miles are worked out on the earnings basis when fares stand at a level rate per mile or if telescopic variations are limited, there will be an additional reduction of 18 clerks, and the strength of the section will then be ...</p>	90	...	120
<p>NOTE.—The figures to represent earnings, passenger miles and number of passengers carried will not be possible according to sections, districts and branches of the line, nor the division of earnings between commercial and military sections.</p>			
Alternative No. 3.			
<p>If the number of passengers forwarded are calculated, and the passenger miles are worked out on the earnings basis, but special provision is made to show the distribution of earnings between commercial and military sections, the effect of this change will be a reduction of 8 clerks only, and the total strength of the section will then be ...</p>	109	...	120
<p>NOTE.—The number of passengers carried, passenger miles and earnings will not be available according to sections, districts and branches.</p>			

The above estimates have been framed without being, in any way, influenced by the requirements of trade statistics prepared for the Commerce Department or for various provinces.

APPENDIX 6—conold.

Statement indicating the amount of work involved in compiling Statistics on the North Western Railway.

Number of stations on the railway.	...	...	...	...	914
Number of invoices received monthly—					
Local	...	...	4,60,000		
Foreign, Inward	...	...	30,000		
Foreign, Outward	...	...	22,500		
Cross	...	...	300		
Railway Materials	...	...	3,330		
					216,130
Number of entries in Passenger Returns—Monthly—					
Local Classification	...	...	96,000		
Foreign	..	...	12,000		
" Inward (Ordinary)	...	...	10,000		
Local Government	...	...	8,000		
Foreign Government (Outward)	...	...	3,500		
" " (Inward)	...	...	3,000		
					132,500

APPENDIX 7.

Railways.	Gross earnings in lakhs of rupees during 1921-22.
CLASS I RAILWAYS.	
Gross earnings over 50 lakhs of rupees a year.	
1. North Western	14,47
2. Great Indian Peninsula	13,89
3. East Indian	13,77
4. Bombay, Baroda & Central India	10,99
5. Bengal Nagpur	6,78
6. Madras & Southern Mahratta	6,74
7. South Indian	4,90
8. Eastern Bengal	4,49
9. Burma	3,53
10. Oudh & Rohilkhand	3,42
11. Bengal & North-Western	2,90
12. Nizam's Guaranteed State	1,72
13. Jodhpur-Bikaner	1,07
14. Assam Bengal	95
15. Rohilkund & Kumaon	62
CLASS II RAILWAYS.	
Gross earnings under 50 lakhs, but over 10 lakhs, of rupees a year.	
1. Mysore & Chikjajur-Chitaldrug	24
2. Gondal	24
3. Bhavnagar State	23
4. Darjeeling-Himalayan	19
5. Dibru-Sadiya	18
6. Barsi Light	14
7. Bengal Dooars	14
8. Morvi	12
9. Junagadh State	11
10. Gaekwar's Dabhoi	10
CLASS III RAILWAYS.	
Gross earnings under 10 lakhs a year.	
All other railways ... ..	...