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Techniques for Goods Transport Surveys in Urban Areas - A Review Paper

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***Abstract:** This study has been undertaken to study Road and rail which is two most important inland modes of transportation available in our country. Rail transport is one of the important and more utilized transport in our country for Goods. Due to growth in infrastructure sector one should find the best possible techniques for Goods Transport surveys in Urban Areas.*
***Keywords:** Registration method, Road-side interview method, Traffic census,Field Surveys, Sampling Technique.*

I. INTRODUCTION

Road and rail are the two most important inland modes of transportation available in the country. But because of the various advantages in the former mode of transportation over the latter, especially in the transportation of different commodities, it is gaining more and more importance. During the period from 1960-61 to 1965-66, the share of goods traffic carried by rail has fallen from 84 per cent to 78 per cent and there is a corresponding increase in the case of road transport. There is a further fall in the proportion from 78 per cent to 76 per cent in 1968-69.Also further study of Roads and Railways is carried out by taking use of websites , online platforms for the year 2017 to 2022.

1) Road and rail are the two most important inland modes of transportation available in the country. But because of the various advantages in the former mode of transportation over the latter, especially in the transportation of different commodities, it is gaining more and more importance. During the period from 1960-61 to 1965-66, the share of goods traffic carried by rail has fallen from 84 per cent to 78 per cent and there is a corresponding increase in the case of road transport. There is a further fall in the proportion from 78 per cent to 76 per cent in 1968-69.Also in Yar 2017-18, 2019-20 and 2021-22 , Continuous increase in Goods Traffic in Railways. Also in Year 2017-18, 2019-20 and 2021-22 , In Roads Good Traffic is less as compared to Goods Traffic transporatation used by Railways.

TABLE I Goods traffic (Billion Tonne-Kilometers) Percentage Share

Year	Railways	Roads	Railways	Roads
1960-61	88	17	83.8	16.2
1965-66	117	34	77.50	22.50
1968-69	125	40	75.8	24.20

TABLE-2 Goods traffic (Million Tonne-Kilometers) Percentage Share

Year	Railways	Roads	Railways	Roads
2017-18	1161	253	1223	272.60
2019-20	1210	295.8	1233	326.30
2021-22	1418	361.3	1512	398.5

2) The higher proportion of goods traffic carried by railways is only because of the low-rated goods in bulk such as coal, iron ore, steel, foodgrains, fertilisers, cement mineral oil etc., which account for more than 60 per cent of the total goods moved by the railways. But all the high rated traffic previously being transported by railways is now going towards road transport. Thus, keeping in view this increasing preference towards road transport, especially for the purpose of goods transportation, it is necessary to provide all facilities for efficient and economical flow of goods traffic in metropolitan cities. For the planning of an efficient system of circulation of goods traffic in a metropolitan city and also for the purpose of recommending suitable locations for goods terminals, parkings, railway goods sheds and other facilities in the city, it is quite essential that exhaustive surveys are conducted to study the different aspects of the problem.

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II. METHODS OF CONDUCTING STUDIES

There are two methods, generally, used for conducting goods transport studies;

1) Registration method,
2) Road-side Interview method.

A. *Registration Method*

1) In this method, an up-to-date list of operators of goods vehicles registered with the local transport authority is obtained along with the addresses of their normal residences or offices. On the basis of a suitable sampling technique, a proportion of the total strength of goods vehicles is selected for the purpose of collection of necessary data. Data regarding the trips performed by the selected vehicles on a reference day along with other necessary informations is collected through personal interviews with the operators at their normal residences or offices.

2) In a study on 'Goods traffic survey in Delhi' conducted by the Ministry of Transport and Communication in 1957, this method of Registration was adopted. But this method has many serious drawbacks and difficulties. The most important drawback is that this method cannot cover those mechanically propelled goods vehicles which are registered with other neighbouring States and at the same time taking active role in the transportation of various commodities to or from the Urban city under study. Even otherwise, this method is quite expensive and time consuming especially in locating the residences of the operators of the vehicles. Also, the accuracy of the data to be collected through this method may not be reliable since it would not be subject to any verification.

B. *Roadside Interview Method*

1) In this method certain suitable focal points are marked, covering the entire study area, which are quite important from the point of view of goods traffic such as:

a) Locations from where the goods traffic is either generated or locations to which the traffic is attracted (terminated) or both such as railways goods sheds, railway parcel offices and mandis etc.
b) Roads which carry heavy volume of goods traffic.

2) Field surveys are conducted on all the selected focal points and the required data is collected at the site itself. This method has many advantages which the previous method does not possess. The data collected can be more accurate and reliable since it is also subject to verification at the site itself.

3) The Central Road Research Institute has recently, conducted an extensive study on the subject, at the request and on behalf of Delhi Administration and the Planning Commission, Government of India. In this study, collection of data was done by the 'Roadside interview method'.

III. TECHNIQUE OF SURVEY ADOPTED IN A RECENT GOODS TRANSPORT

1) Before the actual surveys were undertaken, a pilot survey was conducted of the entire study area and a list of all the suitable locations or roads which were quite important from the point of view of goods traffic as explained earlier were obtained. The selected focal points were further classified into three categories, namely, inner-cordon, mid-cordon, and outer-cordon points. As it was also revealed through the study the classification was mostly based upon the area of service of different vehicles observed at those focal points. All these goods vehicles passing through the inner-cordon stations were found transporting goods mostly within the C.B.D. (central business districts) area of the city. Similarly, vehicles observed at mid. cordon stations were found transporting commodities to both local and inter city areas. While as vehicles passing through the outer-cordon stations were found carrying, mostly, on inter city areas.

2) Having finalised the selection of the locations for the purpose of field surveys, the actual collection of field data was done on these stations by means of (1) Traffic Census of goods vehicles and (it) Interview of goods vehicles.

3) Traffic Census With the help of a suitable proforma, complete census of goods vehicles was obtained both for slow moving and mechanically propelled vehicles passing through both the sides of the survey point, i.e., entering or leaving the survey point. The goods vehicles were classified into the following important categories;

a) Mechanically Propelled vehicles constituting trucks, tempos and others such as truck-trailers etc.
b) Slow moving vehicles constituting bullock carts, hand carts, horse carts (rehras) and others such as camel carts etc.

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4) Interviewing of Vehicles For the purpose of collection of necessary data about the goods vehicles, separate proformae were designed for slow-moving and mechanically propelled vehicles as shown in Appendices 1 and 2. The data was collected regarding the origin and destination of the vehicle, the commodities transported, the load (weight) carried, the distance to which the commodities were transported and all other items as desired. A suitable proportion of the total goods vehicles passing through a focal point were selected and interviewed at the site itself.

5) Sampling Technique

a) Generally for the sake of convenience a fixed proportion of goods vehicles passing through a point is taken for the purpose of interviewing the vehicles. It may be 20 per cent or 25 per cent, by taking every fifth or a fourth vehicle passing through a particular side of the survey point. But since the rate of flow of goods vehicles at a particular point is generally observed to be varying much during different periods, the procedure of taking a constant proportional sampling throughout the day is little difficult as it requires corresponding fluctuations in the strength of the interviewers etc. To avoid this difficulty, a new sampling technique was designed which was adopted for the study conducted by the Institute. In this technique, the two basic requirements kept in view were :--

- Vehicle delay was kept to a minimum, and
- The drivers of the goods vehicles were interviewed strictly according to Random sampling vehicles flowing in a particular direction.

b) To start with the procedure, the first few vehicles were stopped on one side of the road and the interviewers were asked to start their work. While the interviewers were busy with the previous vehicles the other vehicles, passing through the point, were allowed to go till when a previous vehicle had left the interviewing site and the interviewer was ready to start a fresh interview, a signal was given to the police official who then directed the first vehicle that reached him into the interviewing site. The procedure continued till the end.

c) In actual practice only this method of "Variable rate sampling" is always preferred over the other methods of "Time cluster sampling" and "Volume cluster sampling" etc. Interviewers are employed at a constant rate and the size of the sample selected varies with the volume of traffic flow. To reduce bias different sample rates are usually calculated for different classes of vehicle. After the field surveys are completed, the data is statistically processed so as to derive important findings on the basis of which recommendations can be made regarding locations suitable for the purposes of goods terminals, idle parking of goods vehicles, railway yards etc., for an efficient and economical system of flow of goods traffic in the Urban area.

IV. CONCLUSION

1) Benefits of rail transport over road transport, one should keep in mind is :- Rail transport can be cost effective, Shipping via train is more environmentally friendly, Trains are capable of hauling large loads, Railways are reliable, Rail freight can be efficient, Rail options provide you with access to capacity.

2) Rail transports are more dependable than road transport (bad road conditions make road transport undependable).

3) Bad weather does not affect rail transport as much as it affects road transport.

4) As Railways are being managed by the Government in India, the tariff charged for transporting goods is determined only by the Railway Ministry. The rates, therefore, are standardized.

5) Railway accidents are much less when compared to accidents in highways. This ensures safe transportation of goods to different destinations.

6) Railways will have to strictly adhere to the time schedule. This avoids delay.

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A P PEND I X-1
Central Road Research Institute, New Delhi
(Goods Transport Survey*)
(Animal and Hand- drawn vehicles)

Name of the route : Date :
Location of Check-post : Day :
Direction of traffic : Time : Code :

1. Registration number of vehicle.
2. Total number of carts owned.
3. Drawn by Animal—Horse/Bullock/Manually.
4. Type of wheel—Pneumatic/Steel/Rubber.
5. Average miles covered per day.
6. Income per day.
7. Expenditure per day.
8. No. of days the vehicle was idle during the past week.
9. Reasons for idleness.
10. Origin of trip : City (Outside)
Locality (within the city)
Name of the nearest intersection/landmark
11. Destination of trip : City (Outside)
Locality (within the city)
Name of the nearest intersection/landmark
12. Commodities carried Type :
Quantity :
13. Length of trip in miles.
14. Time taken for the trip.
15. Principle type of service : (1) Local, (ii) Inter-city, and (iii) Both.
16. Age of driver.
17. Experience.
18. Whether the driver is educated : Yes/No.
19. If Yes, the standard of education : Primary/Middle/High School.

APPENDIX- 2
Central Road Research Institute, New Delhi
(Goods Transport Survey*)
(Mechanically propelled vehicles)

Name of route _____ Date _____
Location of check-post_____ Day
Direction of traffic Time _____ Code
1. Registration No. of vehicle _____
2. Type and make of vehicle _____
3. Petrol/diesel driven _____
4. Year of manufacture_____
5. Total miles covered so far_____
6. Registered laden weight
7. Unladen weight _____
8. Payload
9. Type of permit : (a) Public/Private _____
(b) Regular/Temporary _____

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10. Area of Permit -Delhi/Punjab/Haryana/15.P. _____
11. No. of employees with the vehicle : Drivers _____ Others_____

12 Average number of miles covered in a month _____

13. No. of days, the vehicle was idle during the last month _____
14. Reasons for idleness _____
15. Origin of trip : (City) outside _____

Locality (within the city) _____

Name of nearest intersection/landmark _____

16. Destination of trip : City (outside)

Locality (within the city)

Name of nearest intersection/landmark _____

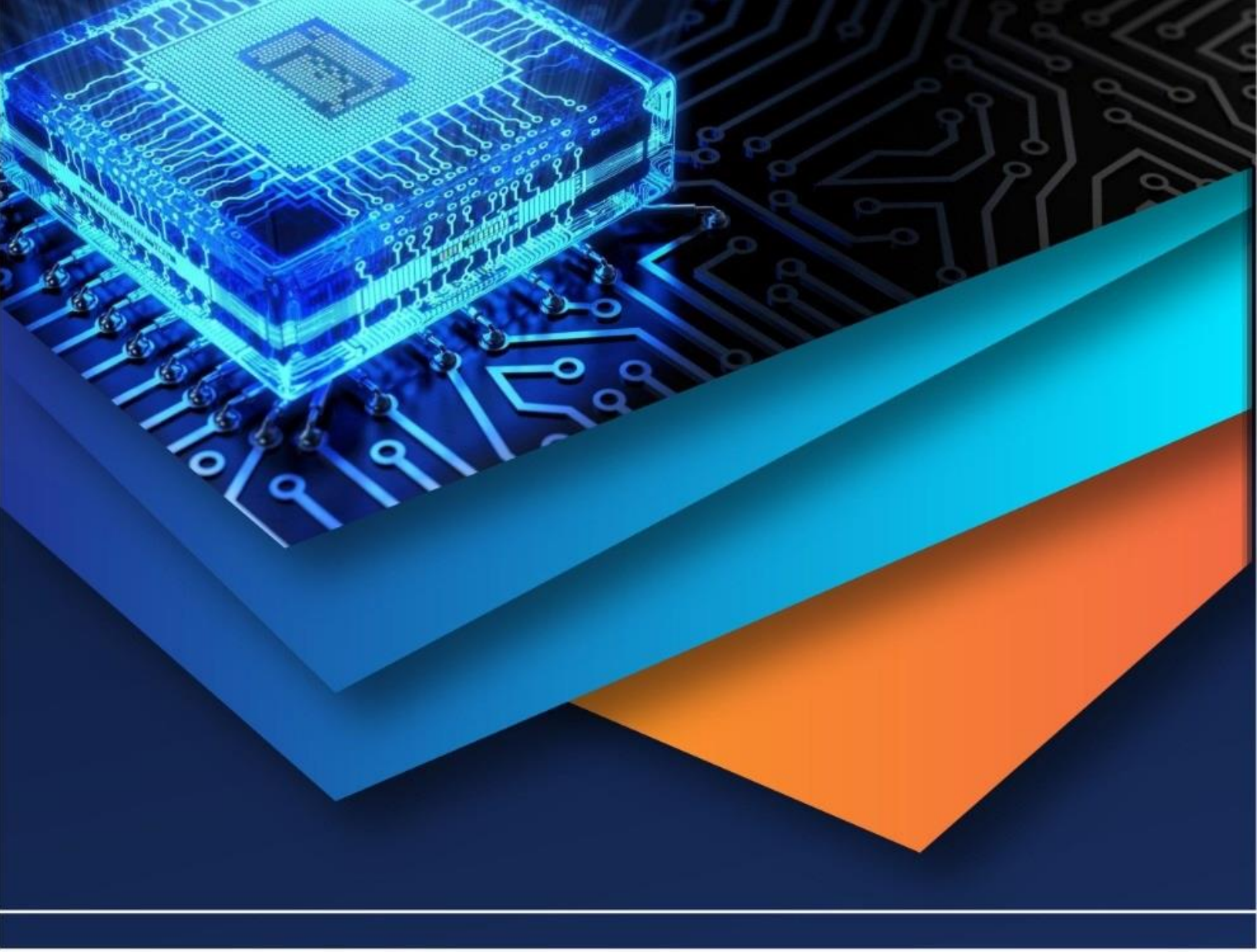
17. Length of trip _____
18. Time required for the trip _____
19. Commodities carried_____

Type _____

Quantity _____

20. Age of driver _ _
21. Driving experience._____ _____
22. Whether the driver is educated Yes/No_____ _____
23. If Yes, the standard of education: Primary/Middle/High School _
24. Monthly Income of driver _____

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