Analysis Of Truck Trips From Ahmedabad To Tamil Nadu And Morbi To Tamil Nadu

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Abstract- India is a developing Asian country. Freight Transportation is very important for development of nation. Generally, Freight Transportation on highway is carried out by trucks. Ahmedabad and Morbi are considered as a study area where the trucks trips are originated for transportation in various regions. Different types of goods and loads are transported from origin to destinations. In this thesis Tamil Nadu is considered as the Destination of this trips generated. Detailed Questionnaire interview survey were carried in various south Indian transport of Ahmedabad and Morbi. Interview from the system operator of the trucks were also carried. 1000s of trucks are travelling from these two sources to destinations every annum. Various data are collected from these interviews. From the collected data, origins to destinations matrices have been developed. Truck trips are assigned on the routes, desire line diagram of truck trips is prepared and truck trip classification is also carried out according to commodity type. Analysis are also carried out from the collected data.

Index Terms- Truck Trips, Freight Transportation, Modal Composition, Trip Generation, Truck, Trip Analysis.

1. INTRODUCTION
Road transport is vital to the economic development and social integration of the country. Easy accessibility, flexibility of operations, door-to-door service and reliability have earned road transport an increasingly higher share of both passenger and freight traffic vis-à-vis other transport modes. In addition to these factors, transit time, availability of capacity on alternate modes, quality and reliability of the service, associated costs like warehousing and demurrage, etc., all influence the choice of the mode of transport.

Freight traffic carried by road and rail increased from 257 billion tone km in 1980-81 to 2053 billion tone km in 2011-12. While the increase in freight movement is impressive, more striking is the changing modal composition. Rail had historically dominated freight traffic, carrying about 60 percent of freight in the early 1980s (Figure 1.2), but it came down to about 50 percent by the late 1980s.

1.1 Aim Of Study
The main aim of this study is to develop a truck trip generation model for the trucks travelling from Ahmedabad and Morbi to Tamil Nadu and to analyse truck trips enrooted between Ahmedabad-Tamil Nadu and Morbi-Tamil Nadu by considering various parameters, to identify various problems facing by truck industries for the route of Ahmedabad-Tamil Nadu and Morbi-Tamil Nadu.

1.2 Objective Of Study
- To analyse truck trips enrooted between Ahmedabad-Tamil Nadu and Morbi-Tamil Nadu by considering various parameters.
- To identify various problems facing by truck industries for the route of Ahmedabad-Tamil Nadu and Morbi-Tamil Nadu.

2. LITERATURE REVIEW
Tomasz Kulpa in 2014 studied Freight truck trip generation is a crucial part of a 4-stage model, especially in regional freight model development. Data needed to construct trip generation equations are usually gathered at company level using the trip diary. Although this approach seems to be most suitable it may not cover all trips made by freight vehicles in analysed area. In this paper, it was shown that empirical values of trip generations for modelling purposes can be obtained not necessary from questionnaires in transport companies. Of course, this gives general overview on truck usage, but still does not give information about all trucks if is conducted on small area. Thus, wider truck survey like TIUS (Truck Inventory and Usage Survey) made in USA should be conducted in Polish condition. This kind of survey should answer questions about garaging places as well as daily truck trips. On the other hand, for specified area, trip generations may be calculated using calibrated O-D matrix.

Joubert and Meintjes in 2016 studied this paper a method of generating synthetic freight populations using a complex network was proposed. It was generally found that the start times of the synthetic activity chains followed the same distribution as the observed activity chains, albeit sometimes underestimated. The number of activities in the activity chains of the synthetic populations correspond to that of the observed activity chains. The complex network approach of generating synthetic freight populations is indeed a
novel approach, and can be used in simulation models to accurately represent freight populations.

3. METHODOLOGY
Methodology has been adopted to collect various data from primary data collection and secondary data collection where primary collection consists of Questionary survey from transporters and personal interview survey whereas secondary survey consists of google maps. After Data collection processes collected data are entered in a excel sheet for analyse where analysis are carried out and various results is been taken.

4. STUDY AREA
In this study Ahmedabad and Morbi are considered as source whereas Tamil Nadu is considered as its destination. The one-way trip from Ahmedabad Tamil Nadu and Morbi Tamil Nadu is considered in this study. The Distance travelled between these two junctions are also considered as study area. There are total 8 Checkposts in these trips (Songadh, Navapur, Pandripur, Jalgi, Nelamangalam, Atthipalli, Hossur, Thopur), but recently the organization rules and system has been changed and all the checkposts are closed. There are total 24 toll plaza for travel between Ahmedabad and Coimbatore and it changes for all other districts of Tamil Nadu.

Ahmedabad is the largest city and former capital of the Indian state of Gujarat. Ahmedabad is the sixth largest city (Area wise) in the country. It is fast developing city because of which many industries such as GIDC of Vatva and Naroda. It is economic center for agricultural export, at both the provincial and national levels. Many industries are available in Ahmedabad such as submersible pumps units, non-woven fabric mill, pin maker mill, textile weaving factory, agricultural industry, biscuits factory, flour mill. Textile weaving factory are been transported in various district of Tamil Nadu. The percentage of different goods which is been transported from Ahmedabad to Tamil Nadu.

5. DATA COLLECTION AND ANALYSIS
For the proposed study required data are collected as per. Questionary survey with transporters and personal interview with truck operator has been carried out for primary data and for secondary data google maps.

5.1 Time series Analysis for total Number of trips

<table>
<thead>
<tr>
<th>Years</th>
<th>Number of trips Ahmedabad</th>
<th>Number of trips Morbi</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>13112</td>
<td>7096</td>
</tr>
<tr>
<td>2014</td>
<td>13156</td>
<td>7130</td>
</tr>
<tr>
<td>2015</td>
<td>12795</td>
<td>6546</td>
</tr>
<tr>
<td>2016</td>
<td>10096</td>
<td>4547</td>
</tr>
<tr>
<td>2017</td>
<td>10198</td>
<td>4856</td>
</tr>
<tr>
<td>2018</td>
<td>12006</td>
<td>5130</td>
</tr>
</tbody>
</table>
5.3 Trips based on different types of goods

Table 3: Number of trips for different types of goods

<table>
<thead>
<tr>
<th>Types of goods</th>
<th>Number of trips</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ahmedabad</td>
<td>Morbi</td>
</tr>
<tr>
<td>Agriculture</td>
<td>3704</td>
</tr>
<tr>
<td>Ceramic</td>
<td>1327</td>
</tr>
<tr>
<td>Powder</td>
<td>1978</td>
</tr>
<tr>
<td>Chemical</td>
<td>2674</td>
</tr>
<tr>
<td>Equipment</td>
<td>5180</td>
</tr>
</tbody>
</table>

5.4 Trips based on different types of goods

Table 4: No of trips for types of vehicles

<table>
<thead>
<tr>
<th>Type of vehicle</th>
<th>Number of trips</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ahmedabad</td>
<td>Morbi</td>
</tr>
<tr>
<td>16T</td>
<td>1544</td>
</tr>
<tr>
<td>21T</td>
<td>4198</td>
</tr>
<tr>
<td>25T</td>
<td>6275</td>
</tr>
</tbody>
</table>

Figure 5: Month wise statistics of total no of trips for base year in Ahmedabad and Morbi.

Figure 6: Frame of truck transportation for different types of goods (Ahmedabad)

Figure 7: Frame of truck transportation for different types of goods (Morbi)

Figure 8: Frame for truck transportation of types of vehicle (Ahmedabad)
6. FINDING FROM THE STUDY

- Reduction in total trips observed for duration of 2016 & 2017 year due to reduction in production due to implementation of GST.
- Maximum trips are observed during February month from both origins and the reason is clearance of stock at reasonable rate due to ending of financial year.
- Most of the trips are attracted at west Tamilnadu.
- Minimum trip distance lies between 1551 km – 1600 km and maximum trip distance lies between 2301 km – 2350 km.
- Minimum trip time lies between 110 hrs. – 115 hrs. whereas maximum trip time lies between 146 hrs. – 150 hrs.
- Maximum trips observed from Ahmedabad are carrying equipment's and from Morbi maximum trips are for ceramic products.
- The gradual increase in trips observed with increase in load carrying capacity from both origins.
- Most of the trips are preferring NH more followed by SH, DR & VR.

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