CHAPTER-VI

TRANSPORT SYSTEM FOR DEVELOPMENT
TRANSPORT SYSTEM FOR DEVELOPMENT

INTRODUCTION

An efficient system of mass transportation is the backbone of a developing economy. Transportation planning is, therefore, one of the most effective tools for achieving balanced regional development. Socio-economically, it accelerates the interrelance of urban and rural areas, facilitating the movement of various commodities and services and allows development and maintenance of specialized activities in urban centres of a regional complex. The interdependence of producers and consumers may accelerate or deaccelerate depending on the efficiency of network road and rail transportation, which directly defines the mobility of goods, services and passengers within a specific area or region.

(1) Existing reticule of roads

The district has a good network of passenger buses which have been interlinked almost every village. At present only 14 villages of the district are away from the facility of Haryana state roadways and private buses (See Table 6.1). Although state roadways runs many interstate routes of Punjab, Rajasthan, Delhi, Uttar Pradesh, Uttarakhand and J & K.

The total length of roads within the district is 984 kms. The road length in the district per lakh of population is 104.67 kms. While the state has 109 kms. length of road per lakh of population. But it is important to note that the quality of road
DISTRICT ROHTAK
TRANSPORT RATICULE

Fig no-6.1
surface is not important to note that the quality of road surface is not found satisfactory upon actual examination. In terms of road length per 100 Km² area of the district is 59.67 Kms. Tahsilwise road length according to per 100 sq. km. and per lakh population Meham tehsil has more roads than Rohtak tehsil. See table 6.2. Width of road has not been a very important consideration in the planning of roads up to the last few years mainly because vehicular traffic on the highways was of a rather small magnitude. It has been observed that though, most of the roads in the district have metalled track varying between 4 to 30 metres in width without any separation of traffic lanes. Due to heavy volume of traffic on the major roads special attention is needed for proper enlargement of width and provision of separate lanes for fast and slow traffic for at least the Meham-Rohtak-Delhi (N.H.-10), Panipat to Bhiwani via Rohtak (S.H.-16), Jind-Rohtak-Jhajjar (S.H.-15), Meham-Lakhanmajra-Gohana (S.H.-16A), Rohtak-Sonipat (Major district road), Meham-Jhajjar via Kalanaur. Apart from narrow bridges and frequent closing, closing for longer duration, railway level crossing hindering the flow of traffic on important highways, a large number of settlements are located on both sides of the major roads creating large number of entry points and intersections. In the case of roads carrying long distance traffic, these settlements like Rohtak, Meham, Kalanaur are facing the problems mentioned above.
### Table 6.1

No. of Villages which do not have the bus transport facility

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the village</th>
<th>Approximate distance from the main bus route</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bhali</td>
<td>2 Kms. from Rohtak-Bhiwani route</td>
</tr>
<tr>
<td>2</td>
<td>Muradpurtekna</td>
<td>4 Kms. from Rohtak-Bhiwani route</td>
</tr>
<tr>
<td>3</td>
<td>Jindran</td>
<td>2 Kms. from Rohtak-Bhiwani route</td>
</tr>
<tr>
<td>4</td>
<td>Sampal</td>
<td>5 Kms. from Rohtak-Bhiwani route</td>
</tr>
<tr>
<td>5</td>
<td>Bhamera</td>
<td>5 Kms. from Rohtak-Jhajjar route</td>
</tr>
<tr>
<td>6</td>
<td>Chuliyana</td>
<td>3 Kms. from Rohtak-Delhi route</td>
</tr>
<tr>
<td>7</td>
<td>Dimana</td>
<td>5 Kms. from Rohtak-Delhi route</td>
</tr>
<tr>
<td>8</td>
<td>Gandhra</td>
<td>3 Kms. from Rohtak-Delhi route</td>
</tr>
<tr>
<td>9</td>
<td>Gaddikheri</td>
<td>2 Kms. from Rohtak-Hisar route</td>
</tr>
<tr>
<td>10</td>
<td>Bahujamalpur</td>
<td>2 Kms. from Rohtak-Hisar route</td>
</tr>
<tr>
<td>11</td>
<td>Shekhpura</td>
<td>2 Kms. from Rohtak-Hisar route</td>
</tr>
<tr>
<td>12</td>
<td>Singhpura Khurd</td>
<td>4 Kms. from Rohtak-Jind route</td>
</tr>
<tr>
<td>13</td>
<td>Singhpura Kalan</td>
<td>3 Kms. route Rohtak-Jind route</td>
</tr>
<tr>
<td>14</td>
<td>Majra</td>
<td>2 Kms. from Rohtak-Delhi route</td>
</tr>
</tbody>
</table>

### Table 6.2

Rohtak district: Distribution of road length (2003-04)

<table>
<thead>
<tr>
<th>Tehsil</th>
<th>Total length of Road in Km.</th>
<th>Road length per 100 sq. Km.</th>
<th>Road Length per lac population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rohtak</td>
<td>664</td>
<td>58.35</td>
<td>87.51</td>
</tr>
<tr>
<td>Maham</td>
<td>320</td>
<td>62.62</td>
<td>176.46</td>
</tr>
<tr>
<td>District</td>
<td>984</td>
<td>59.67</td>
<td>104.67</td>
</tr>
</tbody>
</table>
gram, mustard oil steel pipes, live stock are the main item loaded from the district whereas salt, coal, gunny, bags, diesel, kerosene oil, cloth, timber, iron, building stone and various raw materials are unloaded at the district.

**Degree of connectivity**

Transportation reticule can be measured as a series of vertices and a set of edges together with the relationship connecting each edge with two vertices. The concept of connectivity is most meaningful when a given reticule is compared with another reticule. The transport linkage are directly related with the demand for transportation facilities and are indicative of the complexity of the spatial order, imposed on the region it serves.

The degree of connectivity of transport reticule (Road) of the Rohtak district has been measured with the following formula:

\[ C = \frac{E}{\sqrt{V^2 - V}} \]

Where, 'E' is the number of edge or connections in the observed pattern. This measure is sometimes denoted by the Greek latter gamma (γ), and is referred to as the gama index. 'V' is the vertices (node).

Reticule connectivity varies from a set of vertices having no interconnections at one extreme to a set of nodes in
which every node has an edge connecting it to the other. The numerical value of gamma index is between 0 and 1 which may be expressed for the sake of convenience, as a percentage of connectivity.

Rohtak district, which has been administratively divided into two tahsils, shows the degree of connectivity as follows:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Tehsil</th>
<th>Degree at connectivity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Maham</td>
<td>0.29</td>
<td>29%</td>
</tr>
<tr>
<td>2.</td>
<td>Rohtak</td>
<td>0.15</td>
<td>15%</td>
</tr>
</tbody>
</table>

These results exhibit that Meham tahsil (29%) and is more complex than the Rohtak (15%).

**Accessibility**

Accessibility means the ease of contact with relatively little fraction. That is, less wastage in time and energy. It is a part and parcel of man and material progress. The importance of a place more particularly the case with which man can travel from one place to another is an essential ingredient in an expanding economy. There are 139 settlements (93.29 percent) are connected with metalled roads. Only 10 settlements (6.71 percent) fall within the access of 3 km. from the roads, it means the study area is highly accessible by roads.
Accessibility by Rail

The areas located more than 15 kms. away from railway stations are considered inaccessible.

Mainly this type of areas are found in north-western and south-western part of the district. It covers only 2.68 per cent settlements of the whole district.

Movement of passengers

A study of the regional flow of passengers on various routes have been made and the data was collected as part of a study of growth potential of important service centres in the district.

The movement of passengers within the region mainly takes place through Private buses and the buses of different state road transport corporations such as (H.S.R.T.C., R.S.R.T.C., M.P.S.R.T.C. and D.T.C.). A large fleet of such vehicles operates on the regional routes. It has been observed in the study area specially on routes connecting Delhi with Rohtak as this is unable to cope up with the morning rush of passengers to Delhi and their evening flow back from Delhi. A solution of this problem either in the form of a regular commuter's railway service or faster and more efficient road transport services from Delhi to the important urban centres of the district has to be found out.
MOVEMENT OF GOODS

The goods imported to the study area mainly include, cement, chemical fertilizers, coal, bicycles, clothes, kerosene, diesel oil, medicines, hardware goods and iron and steel, timber, building stone etc. The variety of goods exported from the district is larger than the range of goods imported. The district exports agricultural products like food grains, pulses, gur, sugar, mustard oil, milk and milk products, and vegetables, vanaspati oil, agricultural implements, cotton and livestock etc. Thus the study area is an 'export area' in respect of agricultural products. The regional vehicular traffic indicates that the intensity of goods movement in the region by road is quite high. The proportion of trucks is the highest on the State Highways.

OPTIMALITY OF TRANSPORT SYSTEM

The National Capital Region (N.C.R.) is characterized by high mobility especially between the rural and urban and the Delhi metropolis and also by net migration to Delhi from the surrounding areas. Development of transportation facilities in the Region may only aggravate this situation if incentives for development in the rural and urban areas of the region are not provided side by side. The existing and proposed transportation arteries should, therefore, be designed as corridors for extending development services and infrastructure to the rural growth areas. This means that creation and improvement of new transportational linkages
should be done primarily to open up new areas for
development without allowing the concentration of economic
activities and development infrastructure to strengthen in the
central urban areas.

It is necessary that the existing transport network
should be examined in relation to the concentration of
population and economic potential of different areas. The
network of transportation and communication should be
extended to the various concentration of population and the
underdeveloped regions, especially those which have a higher
economic potential and high import and export capability.
These under served areas should be linked to the rest of the
region and other neighbouring areas.

Though, it is neither possible to make accurate
projections of traffic flow without making detailed surveys on
gravity type models, nor it appears necessary to do so in view
of the rather extensive and general nature of the district plan,
an assessment of the future pattern of growth of traffic can
provide useful guidelines for detailed designing of the road
traffic network in future. The 'Report of Chief Engineer's on
road Development plan for India (1961-81)', popularly known
as the 'Bombay plan' has recommended an increase in average
road density from 185 to 370 kms. per thousand square kms. in
the country and 500 kms. per thousand square kms. for
developed and agricultural areas.
In comparison with the requirement of 500 kms. of road length per 1000 sq. km. for developed and agricultural areas 1981, the Rohtak district at present has only a little more than 596.73 sq. kms. of road length per 1000 sq. kms.

Therefore, it may be said that the study area has adequate transport facilities. For example, at present, the total length of roads per thousand sq. km. in Meham tahsil and Rohtak tahsil 626.22 and 583.48 kms. respectively. It is obvious, that the length of roads per 1000 sq. kms. in the study area is more than the length proposed by Bombay Plan.

REQUIREMENTS:
1. As Rohtak district has special importance in the N.C.R. Plan. People from surrounding around Delhi do their trade or service in Delhi. Due to it the pressure of population on Delhi is excessively increasing. If this pressure of population is to be reduced, then the setting up of cheaper and faster transport system becomes an urgent necessity. If a person working in Delhi get the convenience of easy and fast transport facility, he will be able to go to Delhi from his native place instead of residing in Delhi and in this way the pressure of population on Delhi will be reduced.

2. The study of movement of passengers within the study area reveals that the frequency of buses on the Rohtak-
Delhi route is the greatest. Inspite of this the rush of passengers increases in the morning and in the evening.

3. Due to poor quality of roads and poor bus service there is always a great rush on the bus stands. This problem gives impetus to improve the quality of roads and increase the frequency of buses and open up new rail service on the route from Meham to Rohtak.

4. The opening up of new rail service will result in quick development of the hidden resources in these areas and it will lead to the socio-economic development of the people there.

**Potentials for transport development**

The study area is mainly agricultural and it is known mainly for agricultural produce (wheat, rice, pulses, oil seeds and sugarcane etc.). The map showing major land use pattern and transport network, it may be seen that there is a marked concentration of transport network in an area under cultivation. This indicates that transport works as catalyst in bringing about agricultural development of the area.

Formerly the self sufficient village economy did not warrant much exchange, thus there was least development of transport. But at present due to increased consumption of fertilizer, HYVs high intensity of irrigation, per acre yield has been increased. So every villager would like to send his
agricultural commodities as far as possible to a better competitive market so as to get more profit. The profit of the cultivator is determined by the difference between the cost of production plus transport and the selling price of the goods. The cultivator now prefers to produce such things as can be easily sold and as may fetch him handsome return for his labour.

This naturally involves his decision for selecting an appropriate market place, may be a distant place but connected with available means of transportation.

PROPOSALS FOR TRANSPORT DEVELOPMENT

The following proposals have been determined on the basis of its potentials and requirements:-

1. 14 rural settlements (9.59 per cent of the total rural settlements) which are away from the bus service should be considered.

2. Some of the roads within the district are proposed to be upgraded some of them should be given express way and state highway standard in accordance with N.C.R. plan. For example National Highway No.-10 should be upgraded as express way and major district road should be upgraded as state highway.

3. Width and condition of roads are not satisfactory in the study area, hence, due to heavy volume of traffic on the major roads special attention is greatly needed for proper
enlargement of width and provision of separate lanes for fast and slow traffic of at least the Meham, Rohtak-Delhi (National Highway), Jind-Rohtak-Jhajjar, LBhiwani to Panipat via Rohtak (State Highway).

4. Railway over bridge and byepass road should be provided at Rohtak.

After upgradation of roads into a State highway standard will help to achieve a rectangular pattern of highways directly linking with Delhi, Sonipat, Panipat, Bhiwani and Jind.
REFERENCES


