In ancient times, when people moved nomadically from one place to another in search of food, the beaten path or tracks were the only means of communication. The period of this nomadic movement is not certain. "Nor is it certain what period of time passed before Man, tiring of interminably wandering on and on in his quest, settled at one particular spot and went on gathering or killing food to be taken back to his family" (Eaton, 1955). Even in the agricultural stage of the development of economic life when people inhabited sparsely populated self-dependent hamlets, roads did not exist. The importance of roads came to be realized only when organised governments were established. In the words of an old economist, Jeremy Bentham: "Roads are the veins and arteries of a country through which every improvement channels and circulates." It is interesting to quote here the observation made by a famous author regarding the general significance of roads in modern world: "The road is one of the great fundamental institutions of mankind. Its history dates back to the dawn of recorded history and beyond" (Srivastava, 1971).

Human culture shows two outstanding developments, namely advance technology and fast growth of cities. The role of transport in these developments has been most significant in organising landscape through better spatial linkage. However, the nomadic movements have proceeded to raise the trade routes, the trails may go to the tracks and ultimately to roads. Nomads discovered the most convenient traffic routes in adjustment with nature. It generally followed the natural line of drainage that afforded certain advantages along their courses. Thus, the routes were evolved rather than created and the geographers call them as "Natural Routes". But the settled people have paradoxically enough created such important construction, both in their nature and the mode of transport using them. After the advent of specialized wheels in carriages, the roads intended for bullock carts and reflecting their local needs to be gradually modified for the use not only by pedestrian's, animal, animal driven carts, bicycles but also by automobiles. They also began to cater the needs of more extensive areas (Meena, 2003).
In the evolution process, the routes and roads in Rohtak division were following the same pattern. Though numerous trade carven and army route existed prior to the present century, but no systematic account is available about their nature, structure and length of routes and roads before 1900 A.D.

We found that the history of road development in India can be traced back to as early as 3500 B.C. The noted metalled road belonging to the period of Harppa-Mohenjodro civilization was excavated at Rajgir near Patna. The means of communication were really very hard and difficult in the middle ages. The upkeep of the highways was not satisfactory. The Population was sparse and cities were situated at considerable distances. They were interspersed with dense forests and crossing them was a hazardous job. For a country’s efficient administration provision of good roads was an indispensable necessity. The proper maintenance of old roads and the construction of new ones were, thus, considered to be one of the primary duties of local officers. Good roads undoubtedly lead to the progress and prosperity of people, but during the Sultanate Period, it was not well being of the people that actuated the state to direct its attention to their development. But the military necessity forced the rulers to look after roads. Good roads were actually means to safeguard the ruling interests of a monarch. In order to do this, capital was connected with all different provinces by a network of roads, so that in the time of need, the royal army might be quickly dispatched to the seat of the enemy’s citadel. In due course of time, small markets sprang up near the public houses constructed by them. Sher Shah Suri constructed a long highway running from Rohtas in the Punjab up to Sunargaon in Bengal. But to say that before Sher Shah there was no road connecting Lahore with Delhi or Bengal was a misstatement (Singh, 1972).

During the regime of Guptas and Mauryas, a good network of roads existed in India in the medieval ages. As far as study region is concerned, particularly Shershah Suri and at later stage the Mugals contributed a lot to the extension of roads mileage.

The period of evolution and development of the roads in the study region has been classified in the five phases for the purpose of present study:
3.1 EARLY PERIOD BEFORE INDEPENDENCE (BEFORE -1900):

In ancient times, the means of communication and roads were poor in most parts of the country. The life was restricted to the villages. The desires and choices of the people were limited. Only on rare occasions, such as visits to holy places, people used to travel from one place to another and that too in groups, on foot by taking a long time to complete their onward and inward journey. Country carts and cart tracks were used by common people in the villages for the movement from one village to another. Initially the Rohtak division was a part of Punjab State. In 1966 erstwhile Punjab state was bifurcated into Punjab and Haryana. Depending upon dominant regional language southern part of erstwhile Punjab was rearranged and grouped as Haryana.

Karnal, from the very beginning, has been on the high-road to Capital of India, Delhi. Shershah Suri recognized the advantages of improved means of communication and constructed a road from the coast of Bengal to his great fort at Rohtas, north in Jhelum, in 1543 A.D. The road was later improved upon by the Mugal Emperors who constructed spacious seriais with bricks and stones, 8 Kos apart and 20 – 30 feet high Kos minars, 2.50 miles apart. The Kos minars extend at a number of places in the study area and the gateway at Gharaunda marks the route of the Old Royal Road in the Gharaunda tahsil. During the rule of Britishers, East India Company, Karnal was the frontier post to keep a watch on the Sikh states and some of roads built by British converged here (Gazetteer, 1970).

Historically the road development aspect was neglected in Rohtak division and also in whole of India in the pre-independence period. The roads were built principally from administrative and strategic points of view. Yet, it must be admitted that the pace of road construction activity was accelerated with the advent of British rule in India. The East India Company, which was mainly a commercial corporation, did not evince much interest in road making in the country. Lord William Bentick revived the idea of constructing roads by connecting Peshawar, Delhi and Kolkata. In his time, the Military Boards used to look after the maintenance of roads. It was only during the regime of Lord Dalhousie that a Central Public Works Department was created in the history of road development. In 1855 such departments were created in provinces also, eliminating Military Boards. The macadamized roads in this region
were introduced for the first time by the board of administration. The proper scientific construction of roads in Rohtak region began with the reorganisation of Public Works Department in 1854 (Khan, 2003).

Prior to its annexation in 1859, the roads in the study division were in an appalling condition. There were old type fair weather roads serving for the transportation of grains to the market, which served well, even over the dry river beds during the winter. By 1870, the roads improved remarkably. In 1879, the Rohtak district, middle part of the study area had 90 Km of metalled and 818 Kms unmettaled roads, but no railway or telegraph line touched the district (Gazetteer, 1966).

A very large of number of unmettaled roads also served as links between the interior of the rural tracts and between various metalled roads as below:-

- Karnal to Assandh
- Karnal to Meerut
- Indri to Chaugarwa
- Panipat to Kaithal
- Panipat to Rohtak
- Panipat to Snaouli
- Panipat to Safidon
- Rohtak to Jhajjar
- Sonipat to Mimarpur Kharkhoda
- Sonipat to Bhagpat

By the end of 19th century, Grand Trunk Road was passing from northern part of Rohtak division to southern part and one another important road Delhi-Hisar-Sulemanki road was traversing division from eastern part to south-western part. These two were the only metalled roads in the division and all other roads were unmetalled (Map 3.1). The total metalled road length was 230.82 Kms.

Account about the traffic and condition of roads written by Mr. Fanshawe in Rohtak District Gazetteer: “The lines that carry most of traffic are firstly, the Gohana - Rohtak road which in winter, I have seen in worn condition in short span of two months by heavy cotton laden carts from a first class motor track to a series of holes which would each shelter a litter of pigs, Secondly, Gohana-Bhiwani, Gohana-Panipat and Gohana-Sonipat roads also carried a good deal of traffic”.

3.2 UNDER BRITISH RULE (1900-1947):

By the year 1912, there was some improvement in the roads, in addition to Grand Trunk Road. The position of metalled roads in Rohtak division was not satisfactory. During this period, unmetalled road which had been transformed to metalled roads were Gohana-Rohtak, Sampla-Kharkhoda-Sonipat, Rohtak-Kharkhoda and Gohana-Meham (Map 3.2).

With the opening of the railways, British Government had maximum opportunities for earning revenues, hence road development was neglected. The advent of motor transport after World War I, however, redressed this imbalance. Many feeder roads and highways were constructed to connect the interior of the Rohtak division with railway stations.

All the roads were usually good in fair weather and easy for country carts, except after heavy rain. The village roads, however (called gondhas) were not good. As a rule, they were about as straight as cork screw and they lay below the level of country roads. They were consequently bad flooded by rain or canal cut bursting. They were perpetually being encroached on and occasionally a water course or trench was dug right across them. Many of the unmetalled roads were strikingly broad, but heavy traffic of carts soon spoiled them and was often bad for driving and riding alike. While repairing to them it might be impossible to raise a driving path on one side (separated by a ditch or mud embankment from the rest of road), on which country carts could be tabooed and light traffic allowed (Gazetteers, 1966).

After 1919, the construction of roads proved beneficial for the government as well as for the people. It facilitated easy military transport. This region was situated in between the north-west frontier and the major part of British Empire in India. Through the Grand Trunk Road and other roads, British authorities could transport soldiers for army more easily and timely. Apart from this, the imperial government could take prompt action against rebels and lawless elements.

The condition of roads under the British rule was generally not good. While drawing the attention of government towards the backwardness of road
communication in province, Sewak Ram a member of Punjab legislative council, Multan division said that numerous roads in the province were not metalled and it was difficult for people to travel by unmetalled roads. He severally criticized government on this account and said that many roads were getting into disrepair and means of communication had become very bad. Pir Akbar Ali (urban) opined similarly for those which were in bad condition in many places and required serious consideration of government (Singh, 1971).

Some feeder link roads were constructed near main roads in that time, namely Rohtak to Gohana, Meham to Gohana, Sampla to Kharkhoda, Sonipat to Kaithal, Panipat to Meerut and Karnal to Indri road. The total metalled road length was 474.66 Kms in 1947.

3.3 AFTER INDEPENDENCE (1947 – 1955):

In the year 1947, when the country became independent, the area falling under metalled roads in Haryana was only 1,895 Kms. The roads were classified as National and State Highways, district major and minor roads and village roads.

The National and State Highways and district major roads were maintained by Rohtak and Karnal provincial division of the Punjab PWD. The district minor and village roads were under the preview of Zila Parishad, but due to stringency of funds with Zila Parishad, and in accordance with the recent policy of the government, also many minor roads were transferred to the PWD in Rohtak division. During the post partition period there was a considerable expansion in road construction. Rohtak district occupied the fourth position in respect of road length, Hisar, Gurgaon and Karnal being the first, second and third respectively.

On August 15, 1947 India achieved independence with emerging the new outlook for the constructions of roads. The State Government took over the charge of Nagpur Plan from British companies. India launched the Five-Year Development Plans, but due to the paucity of capital and underdeveloped economy of the state very few roads were added to the earlier network. The partition of country also somewhat affected the progress of roads in Haryana as well as India.
The principal roads of this period compiled from the toposheets of 1955 on 1:2,50,000 scale, published by Survey of India are shown in Map-3.3. During this phase there were small scattered settlements like Jhajjar, Beri, Meham, Ganaur, Indri, Tarori and Nilokheri on the periphery of the division and short roads were connecting them with administrative with in the same state and adjacent province to mark the beginning of the penetration lines (Map-3.4).

It may be regarded as the period of scattered nodes and the beginning of penetration lines. During this period, most of the tahsil headquarters were connected with the main nodes of study area like Karnal, Panipat, Rohtak, Sonipat and Jhajjar. The administrative centres and all the towns, both with in the division and with the adjacent province, were linked with each other.

Roads of study area have been classified for the purpose of present study as follows:

1) National Highways.
2) Major Roads.
3) Other District Roads.
Table 3.1
Rohtak Division
Metalled Road (1955)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of Tahsils</th>
<th>N.H.</th>
<th>MJR</th>
<th>ODR</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Karnal</td>
<td>23.72</td>
<td>--</td>
<td>93.82</td>
<td>117.54</td>
</tr>
<tr>
<td>2</td>
<td>Indri</td>
<td>--</td>
<td>--</td>
<td>11.80</td>
<td>11.80</td>
</tr>
<tr>
<td>3</td>
<td>Nilokheri</td>
<td>18.40</td>
<td>--</td>
<td>--</td>
<td>18.40</td>
</tr>
<tr>
<td>4</td>
<td>Assandh</td>
<td>--</td>
<td>--</td>
<td>34.00</td>
<td>34.00</td>
</tr>
<tr>
<td>5</td>
<td>Gharaunda</td>
<td>12.93</td>
<td>--</td>
<td>14.20</td>
<td>27.13</td>
</tr>
<tr>
<td>6</td>
<td>Panipat</td>
<td>21.05</td>
<td>32.61</td>
<td>9.31</td>
<td>62.97</td>
</tr>
<tr>
<td>7</td>
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<td>--</td>
<td>11.80</td>
<td>11.80</td>
</tr>
<tr>
<td>8</td>
<td>Samalkha</td>
<td>12.95</td>
<td>11.00</td>
<td>--</td>
<td>23.95</td>
</tr>
<tr>
<td>9</td>
<td>Sonipat</td>
<td>22.00</td>
<td>--</td>
<td>61.00</td>
<td>83.00</td>
</tr>
<tr>
<td>10</td>
<td>Ganaur</td>
<td>15.22</td>
<td>--</td>
<td>--</td>
<td>15.22</td>
</tr>
<tr>
<td>11</td>
<td>Gohana</td>
<td>--</td>
<td>--</td>
<td>70.78</td>
<td>70.78</td>
</tr>
<tr>
<td>12</td>
<td>Kharkhoda</td>
<td>--</td>
<td>--</td>
<td>33.50</td>
<td>33.50</td>
</tr>
<tr>
<td>13</td>
<td>Rohtak</td>
<td>54.30</td>
<td>--</td>
<td>80.50</td>
<td>134.80</td>
</tr>
<tr>
<td>14</td>
<td>Meham</td>
<td>26.50</td>
<td>--</td>
<td>20.00</td>
<td>46.50</td>
</tr>
<tr>
<td>15</td>
<td>Jhajjar</td>
<td>--</td>
<td>25.00</td>
<td>90.28</td>
<td>115.28</td>
</tr>
<tr>
<td>16</td>
<td>Beri</td>
<td>--</td>
<td>11.00</td>
<td>29.20</td>
<td>40.2</td>
</tr>
<tr>
<td>17</td>
<td>Bahadurgarh</td>
<td>40.83</td>
<td>--</td>
<td>6.00</td>
<td>46.83</td>
</tr>
<tr>
<td></td>
<td>Rohtak Division</td>
<td>247.90</td>
<td>79.61</td>
<td>566.19</td>
<td>893.70</td>
</tr>
</tbody>
</table>

Source: Calculated from Survey of India Toposheets, (1955).

By the year 1955, the division average metalled road length came out to be 52.57 Kms. Six tahsils namely Karnal, Sonipat, Panipat, Gohana, Rohtak and Jhajjar had more road length in comparison to division average metalled road length (52.57 Kms). They were Karnal, Sonipat, Panipat, Gohana, Rohtak, Jhajjar and remaining eleven tahsils had road length below the division average road length.

The total road length of Rohtak division was 893.70 Kms in 1955. National Highway No. 1 was the longest road with length of 126.21 Kms passing through middle part of division, by connecting Karnal, Panipat and Sonipat to Delhi. The length of other roads was 566.19 Kms. Map-3.4 shows sparsely linkages and four important roads in 1955. They were National Highway No. 1, Delhi-Sulemanki road,
ROHTAK DIVISION
ROAD MAP (1955)

Source: Survey of India Toposheets (1955)
Delhi-Jhajjar-Dadri road and Muzaffarnagar-Panipat-Jind road. Tahsil wise distribution of roads in 1955 is shown in Table-3.1, which reveals that Rohtak tahsil had highest length of roads with 134.80 Kms, Karnal 117.54 Kms and Jhajjar 115.28 Kms respectively. Indri and Israna showed lowest road length with 11.80 Kms only.

3.4 BETWEEN 1955- 1971:

The tempo of road construction increased appreciably after 1966. After the formation of Haryana state, the area was given an average increase of nearly 175 kilometers of metalled road per year. At this stage, only 20 percent of Haryana’s villages were interconnected with all weather roads. In first three years after the formation of Haryana state, another 1,000 Kms of new roads were constructed, bringing the total road length to 6,100 Kms. By the end of 1969, only 26 percent villages were connected with black bitumen roads. At the end of 1970-71, the length of Pacca roads in India per 100 Sq. Kms was 12.40 Kms whereas in Haryana, the corresponding figure was 20.90 Kms, and in Rohtak division, it was 21.39 Kms. It can be concluded that Rohtak division has marked a good position in comparison to the rest of India in terms of road length per 100 Sq. Kms. During the period of 1955-71, the total length of metalled road was 2,025.46 Kms in the Rohtak division.

In 1970, the state government took historic decision to embark upon a crash program of linking every village with metalled road. The Indian National Congress set its sights much lower: it aimed at bringing every village with in six miles of metalled road by 1961-81. The Committee on Rural Roads, Government of India, in its reports, published in 1968 laid down the following targets.

The network of roads would bring every village:

1). In a developed and agriculture area within four miles of a metalled road and with in 1.5 miles of any road.

2). In a semi–developed area with in eight miles of metalled road and within three miles of any road.

3). In an undeveloped and uncultivated area with in 12 miles of metalled road and with 5 miles of any road.
The effects of the above policy were seen by 1972-73, an additional 8,380 Kms of new roads were built to bring nearly 60 percent of villages on the banks of roads. This may be termed as period of penetration lines. During this period existing roads were extended. The detailed study (Map-3.5) reveals that the south-eastern part of Rohtak division was more developed in road transport in comparison to the northern and western parts because of being adjacent to Delhi. The demand and services also affected the road development, so this was the basic factor which affected the road length.

### Table-3.2
Rohtak Division
**Metalled Road (1971)**

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of Tahsils</th>
<th>N.H.</th>
<th>MJR</th>
<th>ODR</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Karnal</td>
<td>23.72</td>
<td>79.40</td>
<td>61.08</td>
<td>164.20</td>
</tr>
<tr>
<td>2</td>
<td>Indri</td>
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<td>16.30</td>
<td>22.10</td>
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</tr>
<tr>
<td>3</td>
<td>Nilokheri</td>
<td>18.40</td>
<td>--</td>
<td>50.68</td>
<td>69.08</td>
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<tr>
<td>4</td>
<td>Assandh</td>
<td>--</td>
<td>43.47</td>
<td>13.25</td>
<td>56.72</td>
</tr>
<tr>
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<td>Gharaunda</td>
<td>12.93</td>
<td>--</td>
<td>68.04</td>
<td>80.97</td>
</tr>
<tr>
<td>6</td>
<td>Panipat</td>
<td>21.05</td>
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<td>96.91</td>
<td>150.81</td>
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<tr>
<td>7</td>
<td>Israna</td>
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<td>48.77</td>
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</tr>
<tr>
<td>8</td>
<td>Samalkha</td>
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<td>11.00</td>
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<td>115.33</td>
</tr>
<tr>
<td>9</td>
<td>Sonipat</td>
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<td>123.28</td>
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<td>33.50</td>
<td>53.82</td>
<td>87.32</td>
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<td>Rohtak</td>
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<td>94.00</td>
<td>97.16</td>
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</tr>
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<td>Meham</td>
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<td>34.90</td>
<td>20.28</td>
<td>81.68</td>
</tr>
<tr>
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<td>Jhabbar</td>
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<td>114.38</td>
<td>103.71</td>
<td>218.09</td>
</tr>
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<td>Beri</td>
<td>--</td>
<td>24.00</td>
<td>49.09</td>
<td>73.09</td>
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<tr>
<td>17</td>
<td>Bahadurgarh</td>
<td>28.83</td>
<td>27.06</td>
<td>135.70</td>
<td>191.59</td>
</tr>
<tr>
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<td>Rohtak Division</td>
<td>235.90</td>
<td>674.26</td>
<td>1115.30</td>
<td>2025.46</td>
</tr>
</tbody>
</table>

Source: Calculated from Survey of India Toposheets, (1971).
ROHTAK DIVISION
ROAD MAP
(1971)

Source: Survey of India Toposheets (1971) Map - 3.5
It was observed that total fifteen roads were important during this period as below:

1) National Highway No. 1.
2) National Highway No. 10.
3) Delhi-Jhajjar-Dadri Road.
4) Jhajjar-Patoda Road.
5) Jhajjar-Farruknagar Road.
6) Rohtak-Jhajjar Road.
7) Murthal-Kharkhoda-Jhajjar-Rewari Road.
8) Panipat-Gohana-Meham Road.
9) Kalanaur-Rohtak-Gohana Road.
10) Rohtak-Lakhanmajra Road.
11) Meerut-Sonipat-Gohana Road.
12) Muzaffarnagar-Panipat-Jind Road.
13) Karnal-Assandh-Jind Road.
14) Karnal-Indri-Radour Road.
15) Karnal-Nisang-Pundri Road.

In the year 1971, the division average road length was 119.14 Kms. Seven tahsils had more road length than the division average of 119.14 Kms and main tahsils were Rohtak (245.46 Kms), Jhajjar (218.09 Kms) and Sonipat (182.78 Kms). Ten tahsils had road length below division average road length and main tahsils were (Indri 38.40 Kms), Assandh (56.72 Kms) and Israna (62.69 Kms). The Map-3.5, 3.6 shows the situation of road length and road length per 100 Sq. Kms of Rohtak division in 1971. Rohtak tahsil had highest road length, but road length per 100 Sq Kms was highest in Bahadurgarh tahsil. It means that the facility of road transport was better in Bahadurgarh tahsil in comparison to other tahsils. The area of tahsil has influenced the road density but other factors had disturbed this sequence like urbanisation and industrialisation etc. This period was very important in the history of Road Making in the study region as well as in Haryana state. During this period the
construction of new roads and bridges, the strengthening and widening of existing roads was carried out. A clear observation was made by Mr. Munilal in 1972 about the situation of roads and their future developments. Road maintenance which is a money consuming exercise was not ignored either. A progressive increase in the provision of funds for this purpose reflects the forget-nothing approach to their assignments by administrators and technical experts in Haryana state. The maintenance and improvement of the state highways was the main concern throughout the year. Special care was taken to maintain the rural and link roads in good shape. The hectic activity on all aspects of road development-construction of new roads, provision of new bridges, strengthening and widening of existing roads, improvement of national highways was being maintained in the face of acute shortage of trained engineers, as also of normal road-building machinery and equipment. Despite these handicaps, the day does not seem far distant when every village in Haryana will be on a black-top road (Munilal, 1972).

3.5 BETWEEN 1971-2001:

With the increase of agriculture production, in 1974 the state government also decided upon mobilizing the resources of the Market Committees in the form of their contribution towards construction of roads. Previously the Market Committees used to contribute the specific roads in their marketing areas but since then they were expected to subscribe substantially to the construction of link roads in the whole of the division. This was designed to generate a better rural economy by enhancing the area of road transportation, free up and down movement of the villagers.

With the help of Table-3.3 and Map-3.7, 3.8 it can be concluded that Rohtak, Jhajjar and Karnal are the three tahsils which show the highest length of roads in 2001, because Rohtak and Jhajjar are situated in National Capital Region and Karnal tahsil is agriculturally developed. These factors affected the growth of roads in these tahsils. Kharkhoda tahsil shows the lowest road length with 106.35 Kms. The division’s average road length is 296.65 Kms in 2001. Seven tahsils have more road length than division average and ten tahsils have lower road length than division average.
ROHTAK DIVISION
ROAD MAP
(2001)

NATIONAL HIGHWAY
STATE HIGHWAY
MAJOR ROAD
OTHER ROAD

10 5 0 10 20 30
KILOMETRES

Source: Public Works Department, Chandigarh
Map - 3.7
Table-3.3
Rohtak Division
Metalled Road (2001) ___________________ In Kms

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of Tahsil</th>
<th>N.H.</th>
<th>S.H.</th>
<th>M.D.R</th>
<th>O.D.R.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Karnal</td>
<td>23.72</td>
<td>79.40</td>
<td>9.30</td>
<td>320.09</td>
<td>432.51</td>
</tr>
<tr>
<td>2</td>
<td>Indri</td>
<td>--</td>
<td>16.30</td>
<td>--</td>
<td>215.84</td>
<td>232.14</td>
</tr>
<tr>
<td>3</td>
<td>Nilokheri</td>
<td>18.40</td>
<td>21.80</td>
<td>24.64</td>
<td>211.09</td>
<td>275.93</td>
</tr>
<tr>
<td>4</td>
<td>Assandh</td>
<td>--</td>
<td>43.47</td>
<td>30.97</td>
<td>159.62</td>
<td>234.06</td>
</tr>
<tr>
<td>5</td>
<td>Gharaunda</td>
<td>12.93</td>
<td>--</td>
<td>30.16</td>
<td>194.04</td>
<td>237.13</td>
</tr>
<tr>
<td>6</td>
<td>Panipat</td>
<td>29.75</td>
<td>33.64</td>
<td>--</td>
<td>231.00</td>
<td>294.39</td>
</tr>
<tr>
<td>7</td>
<td>Israna</td>
<td>14.30</td>
<td>13.82</td>
<td>6.50</td>
<td>148.48</td>
<td>183.10</td>
</tr>
<tr>
<td>8</td>
<td>Samalkha</td>
<td>12.95</td>
<td>11.00</td>
<td>--</td>
<td>225.54</td>
<td>249.49</td>
</tr>
<tr>
<td>9</td>
<td>Sonipat</td>
<td>22.00</td>
<td>61.00</td>
<td>12.40</td>
<td>274.70</td>
<td>370.10</td>
</tr>
<tr>
<td>10</td>
<td>Ganaur</td>
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<td>--</td>
<td>16.45</td>
<td>231.00</td>
<td>262.67</td>
</tr>
<tr>
<td>11</td>
<td>Gohana</td>
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<td>67.50</td>
<td>--</td>
<td>208.60</td>
<td>302.88</td>
</tr>
<tr>
<td>12</td>
<td>Kharkhoda</td>
<td>--</td>
<td>33.50</td>
<td>12.05</td>
<td>60.80</td>
<td>106.35</td>
</tr>
<tr>
<td>13</td>
<td>Rohtak</td>
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<td>58.00</td>
<td>15.00</td>
<td>465.77</td>
<td>643.07</td>
</tr>
<tr>
<td>14</td>
<td>Meham</td>
<td>34.40</td>
<td>27.00</td>
<td>--</td>
<td>244.20</td>
<td>305.60</td>
</tr>
<tr>
<td>15</td>
<td>Jhajjar</td>
<td>35.98</td>
<td>78.04</td>
<td>39.00</td>
<td>309.61</td>
<td>462.63</td>
</tr>
<tr>
<td>16</td>
<td>Beri</td>
<td>13.00</td>
<td>11.00</td>
<td>13.60</td>
<td>98.00</td>
<td>135.60</td>
</tr>
<tr>
<td>17</td>
<td>Bahadurgarh</td>
<td>28.83</td>
<td>27.06</td>
<td>66.91</td>
<td>193.97</td>
<td>316.77</td>
</tr>
<tr>
<td></td>
<td>Rohtak Division</td>
<td>392.56</td>
<td>582.53</td>
<td>276.98</td>
<td>3792.35</td>
<td>5044.42</td>
</tr>
</tbody>
</table>

Source: Public Works Department, Chandigarh.

3.6 DESCRIPTION OF ROADS IN ROHTAK DIVISION (2001)

National Highways:

1) Grand Trunk Road (N.H.-1):

This is the oldest road passing through eastern part of the division. The road enters in division from Delhi after 25 Kms stone near Kundli village, traverses and leaves the division at 152.21 Kms stone. It runs almost parallel to the Delhi-Ambala-Railway line and passes the division through Sonipat, Samalkha, Panipat, Gharaunda, Karnal, and Nilokheri. The total length of this road is 127.21 Kms in the study area. The road is metalled bitumen-surfaced and has double lane width. This highway is
being widened to the six lane highway. This project is being executed by National Highway Authority of India (NHAI). This road connects Delhi with Haryana, Punjab, Himachal Pradesh and Jammu-Kashmir. This road is very important for defense point of view (Map-3.9).

2) Delhi-Hisar-Sulemanki Road (N.H.-10):
This road was previously known as the Delhi-Multan road and connected Delhi with Sulemanki Head (now in Pakistan). It enters the division from southern part in Bahadurgarh tahsil to Rohtak and connects Hissar tahsil. This is an important road connecting Rohtak to Delhi. The Delhi-Bhatinda railway line runs parallel to this road. The total length of this road is 106.8 Kms in the division which is totally metalled (Map-3.9).

3) BawaJ-Hajjar-Rohtak-Jind Road (N.H.-71):
This metalled road starts from Rohtak and passes through Jhajjar and crosses the division boundary near Kulana, towards Rewari. In Rewari this road extends up to N.H. No-8 near Bawal. The total length of this road is 89.38 Kms. (Map-3.9).

4) Rohtak-Gohana-Panipat Road (N.H.-71A):
This road runs from Panipat town to Rohtak town via Gohana. It connects three main towns of division with each other, Rohtak, Gohana and Panipat. The total length of this road is 69.28 Kms. This is an important transition link for traffic between National Highway No. 1 and National Highway No. 10. (Map-3.9).

State Highways:
1) Karnal-Indri-Shabad Road (S.H.-7):
This road starts from Karnal, reaches Shabad via Indri. The total length of this road is 27.80 Kms, which is all bitumen surfaced road. This road connects Indri town with National Highway No.-1 at Karnal and with State Highway No. 6 at Ladwa (Map-3.9).

2) Kunjpura-Karnal-Kaithal Road (S.H.-8):
This road starts from Kunjpura, runs with in division and connects Karnal with Kaithal. The total length of this road is 42 Kms. This road serves as a link road between Grand Trunk Road (N.H.-1) and State Highway No.-11 (Map-3.9).
ROHTAK DIVISION
HIGHWAYS & MAJOR ROADS
(2001)

10 5 0 10 20 30
KILOMETRES

NATIONAL HIGHWAY
STATE HIGHWAY
MAJOR ROAD

Map - 3.9
3) Karnal-Kachhwa-Pehowa Road (S.H.-9):
   This road runs from Karnal to Patiala after passing through Kachhwa in Karnal district and Dhand in Kaithal district with a total road length of 32 Kms (Map-3.9).

4) Gohana-Jind Road (S.H.-10):
   This road runs from Gohana to Jind. The total length of this road is 16.3 Kms in the division (Map-3.9).

5) Meerut-Sonipat-Gohana-Assandh Road (S.H.-11):
   This road provides a short and direct route from Meerut to Patiala via Sonipat, Gohana, Jagsi, Safidon, Assandh and Kaithal. It starts from Meerut and enters in the division from Jagdishpura on eastern side and after passing through Sonipat, Gohana, Jagsi and Safidon again enters in Karnal district and proceeds to Assandh with 9.21 Kms inside the tahsil boundary. This road further proceeds to Rajond, Kaithal and Ghula via Chika. The total length of this road is 101.58 Kms (Map-3.9).

6) Karnal-Assandh-Jind Road (S.H.-12):
   This road starts from Karnal to Jind via Assandh. This road is black bitumen road with a length of 47.50 Kms (Map-3.9).

7) Panipat-Safidon-Jind Road (S.H.-14):
   This road starts from Panipat and leads to Jind. This road connects Safidon and Jind with N.H. No. 1 at Panipat and total length of this road is 24.94 Kms (Map-3.9).

8) Jhajjar-Farruqnagar-Gurgoan Road (S.H.-15A):
   This road connects Jhajjar town with Gurgaon, one of the main industrial towns of Haryana state with Farruqnagar. The total length of this road is 21.30 Kms in Jhajjar tahsil (Map-3.9).

9) Sanaouli-Panipat road (S.H.-16):
   The total stretch of 41.67 Kms of this road in division is metalled. This enters in the division after crossing the Yamuna River. Major part of this road between Rohtak and Panipat is upgraded as National Highway No. 71A (Map-3.9).

10) Gohana-Lakhanmajra-Meham Road (S.H.-16A):
    The total distance covered by this road in the division is 51.00 Kms. It connects Gohana and Bhiwani by the shortest route (Map-3.9).
11) Rohtak-Kharkhoda-Delhi Border Road (S.H.-18):
This road connects two towns Rohtak and Kharkhoda with Delhi. The length of this road is 43 Kms (Map-3.9).

This road starts from National Highway No.1 (Murthal Chowk) and runs through the division from east to south west via Sonipat to Chuchhakwas. The total length of the road is 80.85 Kms (Map-3.9).

13) Bahadurgarh-Jhajjar-Kosli Road (S.H. 22):
Bahadurgarh-Jhajjar section of the road connects Jhajjar with Delhi-Hisar-Sulemanki road at Bahadurgarh. The total length of this road is 52.35 Kms in Jhajjar and Bahadurgarh tahsil (Map-3.9).

Major District Road:

1) MDR 114: Assandh-Salwan-Khond Road, length-36.95 Kms.
2) MDR 115: Karnal-Munak Road, length-25.20 Kms.
3) MDR 120: Nilokheri-Kharsa-Dhand Road, length -24.64 Kms.
4) MDR 121: Ganaur-Shahpur Road, length-26.00 Kms.
5) MDR 122: Bahadurgarh-Dujana-Chara Road, length-54.81 Kms.
6) MDR 123: Jhajjar-Badli-Delhi Road, length-18.75 Kms.
7) MDR 130: Chuchhakwas-Bahu Road, length-24.00 Kms.
8) MDR 136: Bahadurgarh-Badli Road, length-27.96 Kms.
9) MDR 138: G.T. Road-Nara-Sohati-Bahadurgarh Road, length-38.67 Kms.

3.7 Changes and Development of Road Transport Network in Rohtak Division (1900-2001)

This part of chapter deals with the development of metalled road transport network from (1900-2001). The basic objective of this part is to understand the changes in the road transport network. The development of transport network has played a pivotal role as an artery for men and material between the regions. Many factors involve in the development of transport network. The present day road transport network of a region cannot be explained by one factor alone. In fact, services of interrelated factors are responsible for the development of transport
network as depicted in Fig-3.2 White and senior (1983), considered five factors, which influence the growth and development of transport network and the ways in which changes take places. These are:

**Fig.-3.2**

**FACTORS INFLUENCING THE DEVELOPMENT OF TRANSPORT NETWORK**

1) **The Historical Factor:**-This involves the location and pattern of network, technological development, and institutional development and land use patterns.

2) **The Technological Factor:**-The technological characteristics of each major transport mode are considered together with a discussion of the effects of technological advances.

3) **The Physical Factor:**-This includes physiographic controls upon route selection and geological and climatic influences.

4) **The Economic Factor:**-The structure and nature of transport costs are examined, together with service quality and method of pricing and charging.

Source: Geography of Transport (Saxena, 2005).
5) **Political and Social Factors:** These include political motives for transport facilities; government involvement in capital, monopolies and competition, safety, working conditions and coordination between modes, transport as employer and the social consequences of transport development.

**Formation of Departments and Committees for Road Transport Development in India**

1) Formation of Central Public Works Development (CPWD) during the time of Lord Dalhousie.
2) Reorganization of Public Works Department (PWD) in 1854.
3) In December 1919, a provincial board of communication was formed to consider the development of roads.
4) Royal Commission on Agriculture in India (1926-28).
5) Indian Road Development Committee (1927).
6) Central Road Development Fund (1930).
7) Indian Road Congress (1930) to give recommendation on the quality of roads.
8) Central Road Reserve Fund (1931).
9) In 1943, December a conference of the Chief Engineers was held in Nagpur. In this conference a ten year plan was formulated for the construction and development of roadways in India.
12) Road Research Planning and Advisory Committee (1950).
13) Central Road Research Institute (1952).
15) National Highway Authority of India.

The Table-3.4 and Fig.-3.3 depicts the change in total length in Kms of metalled roads in Rohtak division from early 20th century to 2001. The gradual increase in length of roads after the independence was due to policies of the Government of India especially in the field of agriculture and road network. Agriculture was the only base of Indian Economy at that time. So many committees
Fig. 3.3
Rohtak Division
Sequence of Road Development
(1900-2001)
and programs were launched with the objectives of "The growth of roads and agriculture".

Table - 3.4
Rohtak Division
Sequence of Road Development (1900-2001)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Years</th>
<th>Road Length in (Kms.)</th>
<th>Increase in Length (Kms.)</th>
<th>Growth Rate (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1900</td>
<td>230.82</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>2.</td>
<td>1947</td>
<td>474.66</td>
<td>243.84</td>
<td>105.64</td>
</tr>
<tr>
<td>3.</td>
<td>1955</td>
<td>893.70</td>
<td>419.04</td>
<td>88.28</td>
</tr>
<tr>
<td>4.</td>
<td>1971</td>
<td>2025.26</td>
<td>1131.56</td>
<td>126.61</td>
</tr>
<tr>
<td>5.</td>
<td>2001</td>
<td>5044.42</td>
<td>3019.16</td>
<td>149.04</td>
</tr>
</tbody>
</table>

The Fig.-3.3 reveals a picture that there is a gradual increase in roads length of roads in the 20th century. The length of road in 2001 becomes approximate twenty folded in comparison to the beginning of the 20th century.

The above analysis presents the study of road development in Rohtak division in 1900-2001. The increase of road length was 105.64 percent in 1900-1947 and change of length was 243.84 Kms. The road length became twice in a time span of forty seven years and in next eight years again road length became more than double. It is clear that Government of India has done much for the development of road network in comparison to British and also same trend followed up to the year 1971.

Four categories have been classified on the basis of changes and development in road length during the period of three decades (1971-2001).

1) **Very High Development Area (Above 300%)**: Indri and Assandh tahsils are lying in this category. These tahsils were neglected in the historical time. These tahsils lie aside to main district headquarters and do not have well established industries and commercial trade. Karnal district is an agricultural based area in this division. After independence and formation of Haryana
state different market committees and mandis were opened and organised for the
development of agriculture sector. The main objective of PWD and MBR agencies
was to construct link roads to connect the agriculture area to main market.

**Table-3.5**
Rohtak Division
Changes and Development in Road Length (1971-2001)

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of Tahsil</th>
<th>Length in Kms</th>
<th>% Change in Tahsil(1971)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Karnal</td>
<td>268.31</td>
<td>163.40</td>
</tr>
<tr>
<td>2</td>
<td>Indri</td>
<td>193.14</td>
<td>504.53</td>
</tr>
<tr>
<td>3</td>
<td>Nilokheri</td>
<td>206.85</td>
<td>299.44</td>
</tr>
<tr>
<td>4</td>
<td>Assandh</td>
<td>177.34</td>
<td>312.66</td>
</tr>
<tr>
<td>5</td>
<td>Gharaunda</td>
<td>156.16</td>
<td>192.86</td>
</tr>
<tr>
<td>6</td>
<td>Panipat</td>
<td>143.58</td>
<td>95.21</td>
</tr>
<tr>
<td>7</td>
<td>Israna</td>
<td>120.41</td>
<td>192.07</td>
</tr>
<tr>
<td>8</td>
<td>Samalkha</td>
<td>134.16</td>
<td>116.33</td>
</tr>
<tr>
<td>9</td>
<td>Sonipat</td>
<td>187.32</td>
<td>102.48</td>
</tr>
<tr>
<td>10</td>
<td>Ganaur</td>
<td>178.70</td>
<td>212.81</td>
</tr>
<tr>
<td>11</td>
<td>Gohana</td>
<td>179.60</td>
<td>145.68</td>
</tr>
<tr>
<td>12</td>
<td>Kharkhoda</td>
<td>19.08</td>
<td>21.79</td>
</tr>
<tr>
<td>13</td>
<td>Rohtak</td>
<td>397.61</td>
<td>161.99</td>
</tr>
<tr>
<td>14</td>
<td>Meham</td>
<td>223.92</td>
<td>274.14</td>
</tr>
<tr>
<td>15</td>
<td>Jhajjar</td>
<td>244.54</td>
<td>112.13</td>
</tr>
<tr>
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<td>Beri</td>
<td>62.51</td>
<td>85.52</td>
</tr>
<tr>
<td>17</td>
<td>Bahadurgarh</td>
<td>125.18</td>
<td>65.34</td>
</tr>
<tr>
<td></td>
<td>Rohtak Division</td>
<td>3018.96</td>
<td>149.05</td>
</tr>
</tbody>
</table>

2) **High development area (150% to 300%)**:  
Nilokheri, Meham, Rohtak, Ganaur, Gharaunda, Israna and Karnal lie in this
category. Rohtak and Karnal tahsil showed high development in roads due to location
of first class towns and also district headquarters. Ganaur, Israna, Gharaunda were
located in transition zone between Rohtak division. For example Ganaur was situated
between Panipat and Sonipat, Israna between Panipat and Gohana, Gharaunda
between Karnal and Panipat. It means interaction between two towns also affected the
Fig. 3.4
Rohtak Division
Changes in Metalled Road Length
(1971-2001)
ROHTAK DIVISION
EVOLUTION OF ROAD NETWORK
(1900 - 2001)

PHASE WISE CONSTRUCTION OF ROADS
BEFORE 1900
1900 - 1947
1947 - 1955
1955 - 1971
1971 - 2001
road development in its surrounding areas. Also location of an industry favors the development of tahsils for example in Meham, co-operative sugar mill is the main reason for development of road network in order to transfer raw material as well as finished product. These tahsil grow up with highest growth road length in (1971-2001).

3) **Medium development area (50% to 150%)**:

Sonipat, Beri, Jhajjar, Bahadurgarh, Samalkha and Panipat are located in this category. It means that the rate of road construction is not very high during this period. But the percentage in road change in whole division is high and actual length is also high it means this area already well connected in past.

4) **Low development area (below 50%)**:

Kharkhoda tahsil lies in this category. In Kharkhoda tahsil actual road length was 87.32 Kms in 1971 and 106.35 Kms in 2001. So this figure shows that Kharkhoda tahsil was a neglected area being near to NCR Region. The second factor for low road development is its location that is not on a direct link between any district headquarters and to Delhi.

After this we can conclude that most of the roads in Rohtak division have been constructed in the period of 1955-2001. This was a very important period for the Evolution of Road Transport Network Structure of Rohtak division depicted in Map-3.10. But before 1955, the greatest impediment to proper road development was the lack of finances. The local bodies did not have sufficient funds of their own for the maintenance of old roads and construction of new ones. As the result, the condition of the roads constructed and managed was not good.