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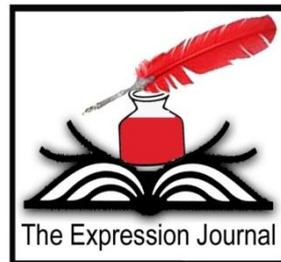
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## **IMPACT OF POPULATION GROWTH ON EDUCATIONAL FACILITIES AND TRANSPORT NETWORK IN KARNAL CITY, HARYANA**

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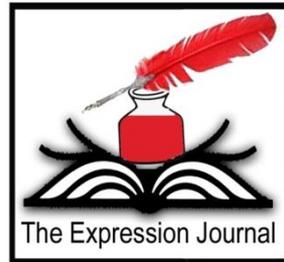
### **Abstract**

It has been examined that the economic reforms implemented in the country in 2001 had major effect on the karnal city. The high rate of population growth is a result of high fertility and migration from surrounding rural areas. It creates a lot of social and economic problems. The Study is based on primary and secondary data combined with primary survey. For the different seasons from 2001, 2011, and 2018, the latest satellite details images of Google earth and Land sat have been used. Apart from satellite, Toposheet No. 53C/14 and the map of the city of Karnal has been used for purposes. ARC GIS 10.0 and MS OFFICE use for the software. Arc GIS 10.0 has been used for geo-referencing and image processing of MC map of Karnal city and software used for the preparation of different thematic layer of map such as ward wise boundary, mc boundary, transport network and location of educational institutions. Analysis shows that the growth of population in the study area is the result of a lot of forces such as education facilities, transport network, employment sources, good status of living, migration and security etc. Karnal City was granted the status of Municipal Corporation by notification on 17 March 2010 (Haryana Government, 2010). The extension is more along the national highway no.44 leads to Delhi. It currently covers 90.57 km<sup>2</sup>, more than three times that of 2001 and includes 10 villages, namely Uchani, Uchana, Munda Khera, Saidpura, and Phooshgarhetc.

### **Keywords**

Population Growth, Educational Institutions and Transport Network.

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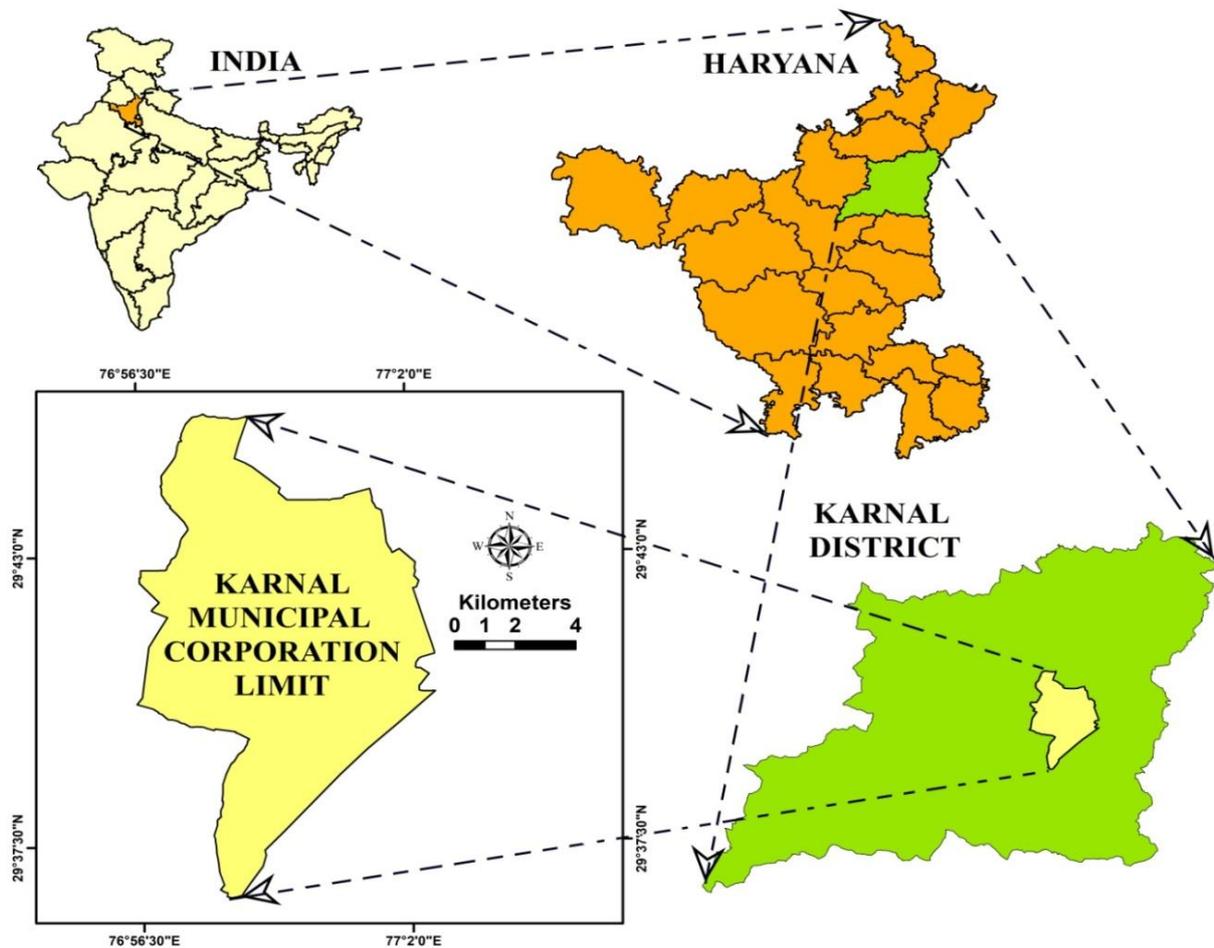
### **Introduction**

The extension of the city and its geographical borders influence its social and economic activities. The principal factor for deciding the growth level of the urban area will therefore be social and economic activities. The research carried out on this subject is focused on socio-economic status. It would be very useful to influence other work as the economic status and lifestyle characteristics vary in the upper level. The role of families as economic and social systems, the essence of jobs, social institutions, and population structures is now generally recognized. The researcher also searched for the modifications which have taken place in the urban side in Haryana from 2001-2018. The aim of the study is to discover the Population Growth, surrounding education facilities and transport network in Karnal city. The world population is becoming increasingly urban and in order to accommodate urban population inflow and to promote development, better planning and effective management is required (UN, 2007). The role of population growth in infrastructure development is well documented in development literature. Population growth rate ordinarily refers to the change in population over a unit time period, often expressed as a percentage of the number of individuals in the population at the beginning of that period. In 1971, the ancient village of Karnal became a Class I town with a population of 0.92 lakhs, which more than doubled to 2.07 lakhs (India Census, 2001). A commensurate increase in the extent from 18.57 km<sup>2</sup> in 1971 to 22.10 km<sup>2</sup> was observed (NIUA 1991). Space had become less dense in town. It acquired urban agglomeration status in 2001, with the addition of HUDA Sector I (1.20 km<sup>2</sup>).

### **Study Area**

Karnal is believed to be a mythological hero and a key figure in the epic story, founded by the Kauravas during the Mahabharata era for king Karnal. The city of Karnal is located at 29°37'50"- 29°44'40"N and 76°56'20"-77°02'50"E in Haryana in the province of India. Karnal is one of the twenty two state districts. The city of Karnal is also the headquarters of the district of Karnal. Karnal's population is 3,57,284 in 2011 after formation of Municipal Corporation. Karnal City was granted the status of Municipal Corporation by notification on 17 March 2010 (Haryana Government, 2010). The extension is more along the national highway no.44 leads to Delhi. It currently covers 90.57 km<sup>2</sup>, more than three times that of 2001 and includes 10 villages, namely Uchani, Uchana, Munda Khera, Saidpura, and Phooshgarhetc.

Fig. 1: Location Map of Study Area



It is located on the national highway No.44 (popularly called GT road) between Delhi and Chandigarh, 123 km north of Delhi and midway between Delhi and Chandigarh. Karnal is renowned for its luxurious grasslands, Liberty shoes, quality Basmati rice production and its many institutes for agricultural and dairy research.

## Objectives

The objectives of the present study are:

- ❖ To analyze the population growth in study area.
- ❖ To analysis the growth of transport network.
- ❖ To analysis the growth of education institutions.
- ❖ To analysis the impact of urbanization on transport network and educational facilities.

## Data Sources and Methodology

The following data sources have been used for the present work. Topsheet No 53C/14 on scale 1:50000 (Survey of India, Dehradun). Guide Map of Karnal City. M.C. boundary Map of Karnal city (2011). For the different seasons from 2001, 2011, and 2017, the latest satellite details images of Landsat have been used with 0% cloud covers are downloaded from [www.glovis.usgs.gov/](http://www.glovis.usgs.gov/). All these data are open-source satellite images and Census data published by the Census of India 2011. Primary data will be collected through a field survey. Study focus on urban expansion and its impact on land use/land cover pattern. Arc Map 10.0 is used for the preprocessing, import image, geo-referencing of satellite data, and the

premier application for desktop Geographic Information System (GIS) and mapping. The Study is based on primary and secondary data (Town Directory Map and satellite images) combined with primary survey. Arc GIS 10.0 software has been used for the preparation of different thematic layer of map such as ward wise boundary, mc boundary, transport network and location of educational institution. Google earth pro has been used for ground true and accuracy for unsure things during image interpretation.

## Population Growth in Karnal City

We see the statistics of Karnal City, there is no significant increase in urban population up to 1931 and it remains varied 23559 in 1901 to 26610 in 1931. After that, there is a continuous increase in urbanization and the urban population increased 59790 people in 1951 to 132107 persons in 1981 and 3,57,284 in 2011 after formation of Municipal Corporation. "In regard to the decadal growth rate of the urban population, it has been observed a highly irregular trend of the growth in the city. The general factors affecting population growth rates are extreme malaria and plague attacks during 1901-1911, mass relocation of people following division during 1941-1951, and government health initiatives. Due to its proximity to Delhi, Karnal City had a strong work opportunity, thus attracting a large number of refugees. In addition, there is a general increase in-country population increasing. Over the course of two decades (1911-1931), an increase in population was nominal. There was a sharp rise in population during the post-independence period (1951-1981), and there was an increase in the urban population in the city (Table 1). "This can be due to the Government's sanitary initiatives. Many people in the villages do not find such facilities. It has been observed that a significant number of people are moving for education and livelihood from surrounding villages to cities. After the establishment of Municipal Corporation, Karnal City my study area has a population of 357284, as indicated by statistics 2011. Males are from 189239 and Females is from 168045. Among the aggregates are 267963 literate individuals. It occupies a total area of 90.57 sq. Km and population density is 3945 people per square km. in the 20th wards in the town of Karnal City.

**Table 1: Growth of Population in Karnal City (1901-2011)**

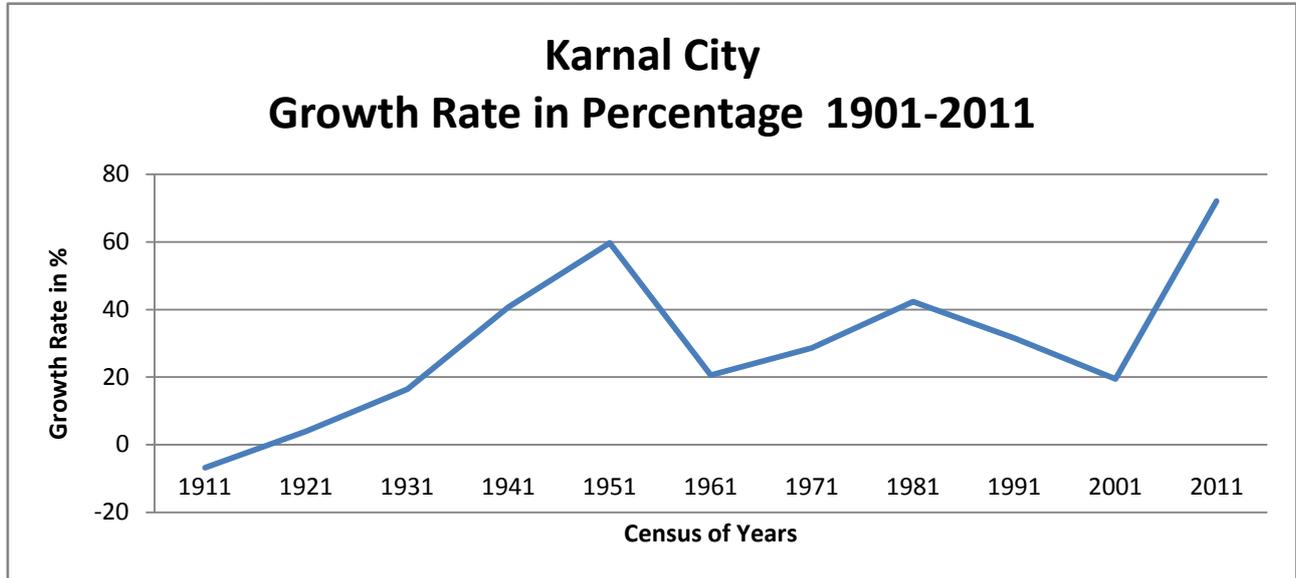
Census year	Population	Variation in Population	Growth Rate in Percentage
1901	23559	.....	.....
1911	21961	-1598	-6.78
1921	22845	884	4.02
1931	26610	3765	16.48
1941	37444	10834	40.71
1951	59790	22346	59.67
1961	72109	12319	20.6
1971	92784	20675	28.67
1981	132107	39323	42.3
1991	173751	41644	31.52
2001	207640	33889	19.5
2011	357284	149644	72.06

**Source:** Primary Census Abstract 1991, 2001 and 2011. Chandigarh, Haryana

In 1981, there was a boom in population when growth rate have increased up to 42.3 per cent. It was the period of population explosion in the population history of India as mortality rate have witnessed a great decline due to availability of better medical facilities. After this period, the population has recorded an increase with surprisingly decline in growth rate and in 2011 it has been recorded only 72.06 per cent (**Table 1 and Fig. 2**). As per 2011 Census, the total population of karnal city is 357284. The city experienced rapid increase in population. The decadal growth rate of population during 1971

to 1981 was about 42 per cent, during 1981 to 1991 it was nearly 31 per cent and during 1991 to 2001 it was nearly 20 per cent (Census of India, 2001).

**Fig. 2: Growth of Population in Karnal City (1901-2011)**



**Source:** Primary Census Abstract 1991, 2001 and 2011. Chandigarh, Haryana

Growth of population in the study area is the result of a lot of forces such as education facilities, employment sources, good status of living, migration and security etc. The highest concentration of have been found in core area of the city which is mainly inhabited by lower income groups, whereas the wards having low population are the part of peripheral and planned areas of the city. This area has less built up area compare to its total area and inhabited by high income groups.

## Education Facilities

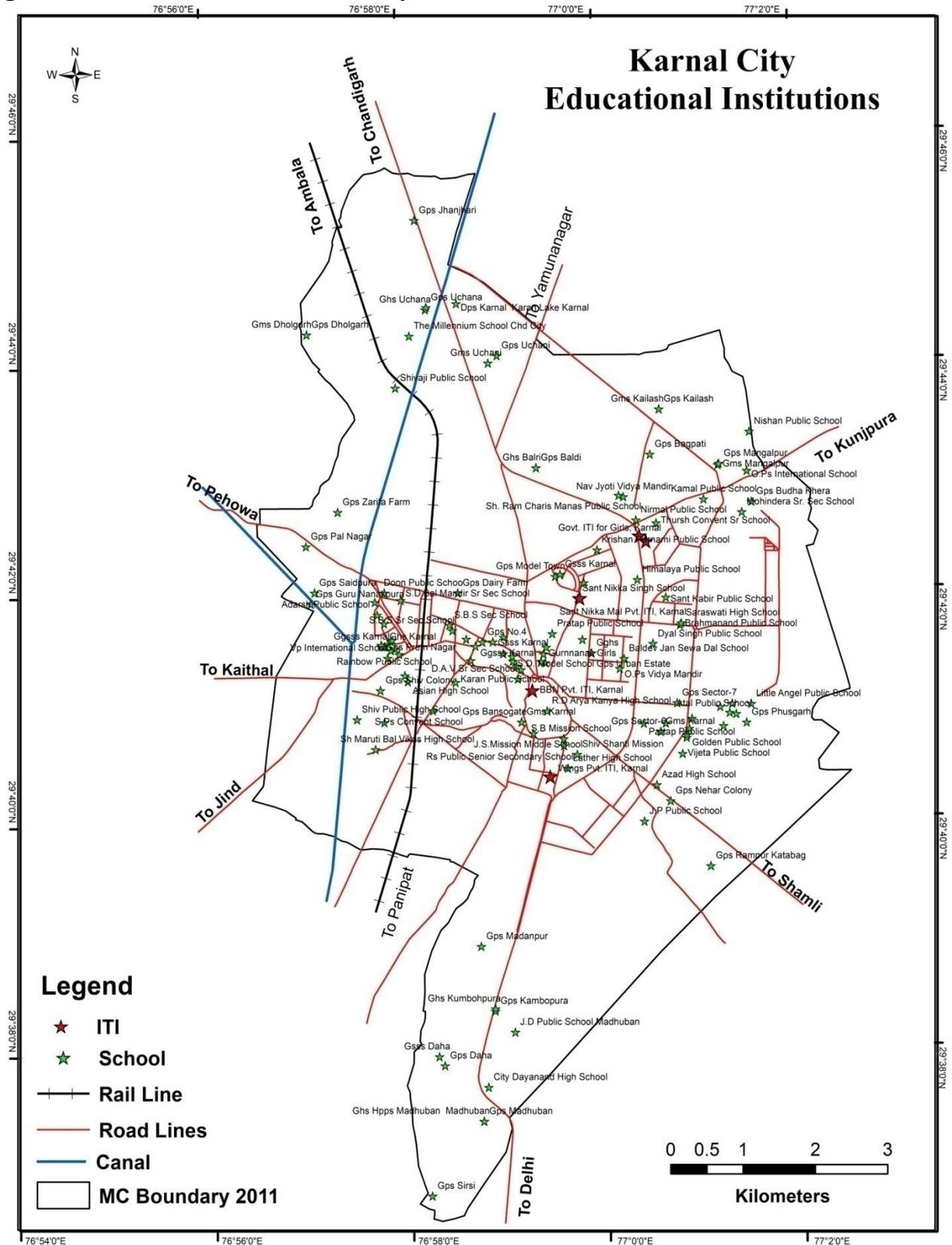
Educational facilities are one of the salient features of urban life. These facilities are essential in order to produce better citizens. The qualitative education plays a very important role to the development of the society (Kadu *et. al.* 2009). All the basic facilities related to the quality education are available in Karnal city. **Fig. 3** shows the location of major educational institutions in the study area. **Table 2** illustrates the change position of educational facilities in Karnal city during 2005 to 2018.

**Table 2: School of Karnal city**

"Year"	"Primary School"	"Middle School"	"High & Sr. Secondary School"	"Total Schools"
2005-2006	2	-	3	5
2007-2008	2	3	5	10
2009-2010	22	4	6	32
2011-2012	25	7	19	51
2013-2014	44	7	23	74
2015-2016	31	7	46	84
2017-2018	36	7	84	127

**Source:** census of Karnal, and department of education

Fig. 3 Educational Institutes of Karnal City



Source: Karnal City Map in M.C. Office & Census of Karnal, and Department of Education

It has been revealed that the number of total school was 5 in 2005; it was reached 32 in 2010 whereas primary schools were only 25 followed by higher secondary or secondary and middle school i.e. 19 and 7 respectively in 2011-12. Most of the increase has been noticed in primary and higher secondary and secondary institutes from 2013 to 2018.

**Table 3: Education Institutes of Karnal city 2018**

Education Institutes	Govt.	Private
Primary	30	6
Middle	6	1
High School or Sr. Secondary School	10	74
ITI	1	4
Total	47	85

Source: census of Karnal, and department of education

## Transport Network

Transportation plays an important role in the political, economic and social development of any society and whether in rural or urban societies, transportation constitutes the main avenue through which different parts of the society are linked together. As a society grows in terms of population and functions, the need for interaction among its various components also grows thereby requiring quality and effective transportation systems (Aderamo and Magaji 2010). They are the main arteries of inter districts and interstate movements of goods and traffic (Dutta, 1975). The growth of the city is directly depending on transport network pattern because high level of transport network creates high level of connectivity and accessibility as well as interaction between urban centers and nearby areas (Rani and Bansal, 2012). Karnal city is almost suffering jam and congestion during peak hours due to the encroachment of roads by the shopkeepers, movementary rehries and illegal parking and improper traffic regulations system. There is need to build flyover on railway crossing and parking places in market areas to solve this problem. The transport network has recorded a remarkable change in the study area (Table 4).

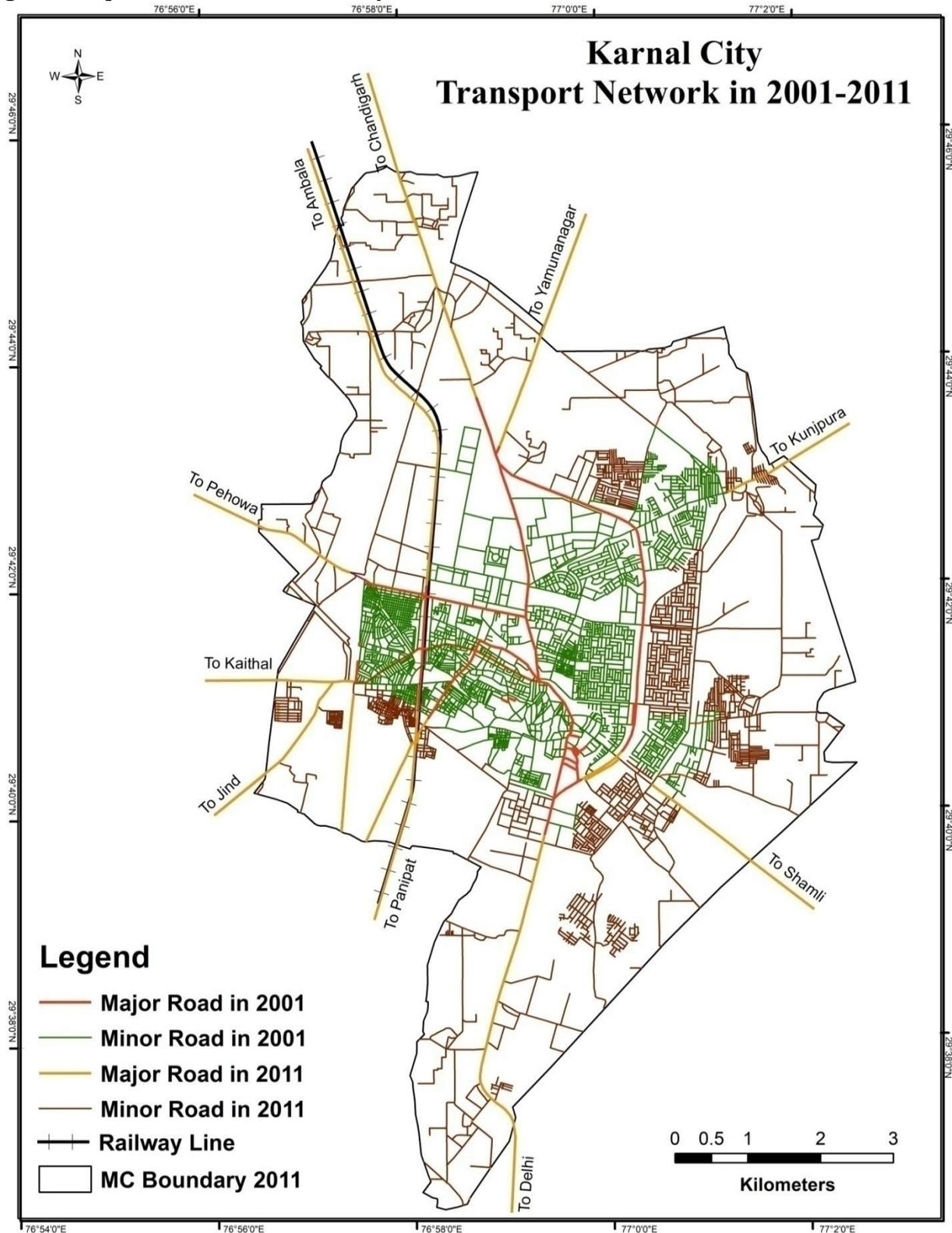
In 2001, major road length was 26453 meter. The minor roads have recorded highest road length i.e. 330910 meter and decreased to 312170 meter in 2011. Length of National Highways in the locale is 52 kilometers and State Highways as 186 kilometers during the year 31-07-2013 according to data provided by the Engineer-in-boss PWD (B&R) In light of the deliberate and true endeavors taken by the Haryana Highway Patrol and Road Safety throughout the previous one year, the mishap and death rate has begun demonstrating huge decay. The street client's conduct has likewise begun improving. Karnal Smart City Limited (KSCL), the company was looking after the smart city project, carried out the beautification work of four major entry roads.

**Table 4: Road Length in Karnal City**

Road Type	Length in Meter		Different in percent
	2001	2011	
Major	26453.38	38806.64	46.7
Minor	330910.3	312170.6	-5.66

Source: Karnal City Map in M.C. Office and Landsat Data 2001 & 2011

Fig. 4 Transport Network in Karnal City



Source: Karnal City Map in M.C. Office and Landsat Data 2001 & 2011

All overhead electric wires were converted into underground power lines for the beautification process. Besides, the KSCL provided all modern features for the beautification of these roads, including tactile flooring, solar panels, solar trees, sitting places, and dedicated space for vendors. The roads include the stretch between bald bypass and NDRI, Devi Lal Chowk and Maharana Pratap Chowk, Namastey Chowk, and Meera Ghati Chowk and Meera Ghati Chowk and Luv Kush Chowk. These stretches will be turned into smart roads under the area-based development (ABD) plan. The city has relatively good road network, particularly in the sectors developed HUDA, where streets are wide and not heavily utilized by traffic. The situation however is different in the old town where roads are narrower and more congested (with both traffic and pedestrians) and the roads are not well maintained (**Fig. 4**)

## Conclusion and Suggestions

Study shows that the development of residential area having good road network was to absorb the increasing population and all this was done on the cost of surrounding agricultural land. It had provided good transport accessibility and connectivity to the people. Map shows that in eastern, north and south direction, the pattern of road network developed by HUDA is rectangular, well planned, wide and having dividers on main road. The improvement in major and minor road network due to new manufacturing of roads in residential area, there is more increase in minor roads. There is no increase in length of rail network because no new rail track was constructed. The population growth (due to employment opportunities, education and security etc.) has also put a burden on urban services like marketing and transport facilities which has resulted in jamming in city and there is need of more over bridge to solve this problem. Study demonstrates the augment in educational institutions from 2005 to 2018. It is also a result of population growth because to provide the good education as well as managing the population is also a responsibility of administration. The major educational institutions are located on both sides of rail network and city centre and it is developed with city establishment. This reflects that improvement in education institution is also associated with road network of the city. The main reason for the population increase in cities is the attraction of employment and education opportunities, good transport accessibility and connectivity, and basic facilities. So there should be a plan to develop these conveniences in the fringe area to control the migration toward the city from villages.

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