



Development of Road Transport in Maharashtra State of India

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ABSTRACT:

Transport is an important infrastructure and a tertiary economic activity. The speed, structure and pattern of development of any region depend on the transport system of the region. The improvements in transport systems increase the mobility of goods and passengers in the region, as well as the development of agriculture, industries and markets. Therefore, just like the body has a network of blood vessels, a country needs to have a dense network of transport routes for economic progress.

The present paper entirely based on secondary data and discusses the scenario of the road transport in Maharashtra. Transport sector in Maharashtra comprises of various modes of transport such as roads, railways, airways, shipping and metro rail. However, road transport is the dominant mode in the state both in terms of contribution to employment and share of passenger and freight traffic.

The state of Maharashtra ranks first in India in terms of length of roads and number of motor vehicles. Compared to India, the road network and number of motor vehicles in the state of Maharashtra is growing at a slow pace. As of 2021 data, the state of Maharashtra has the most extensive road network in India with the longest national highways. State and national highways are in good condition in most parts of the state. Over 50 years (1971-2021), the number of motor vehicles in the state of Maharashtra has increased by about 248% annually.

KEY WORDS: Road Transport, National Highways, State Highways, District Roads, Road Density, Motor Vehicle Density, Growth Rate

INTRODUCTION:

Transport is an important infrastructure and a tertiary economic activity. The speed, structure and pattern of development of any region depend on the transport system of the region. The improvements in transport systems increase the mobility of goods and passengers in the region, as well as the development of agriculture, industries and markets. Therefore, just like the body has a network of blood vessels, a country needs to have a dense network of transport routes for economic progress.

Although land, water and air are the three major modes of transport, road transport (over land) is very important. It is a primary mode of transportation used daily all around the world to transport people and goods. It is one of the most cost effective, reliable and convenient modes of transportation. It has high access level with door-to-door delivery. Therefore, it is important for economic development and social integration of the country.

Transport sector in Maharashtra comprises of various modes of transport such as roads, railways, airways, shipping and metro rail. However, road transport is the dominant mode in the state both in terms of contribution to employment and share of passenger and freight traffic.

AIM AND OBJECTIVES:

The main purpose of this research paper is to present current scenario of the road transport in Maharashtra.

Other supportive objectives of the study are-

1. To compare growth and share of road transport in Maharashtra State with India.
2. To measure the growth of roads and motor vehicles in Maharashtra State.
3. To study the decadal changes of road and motor vehicle density in the state.
4. To study the district level distribution of roads and motor vehicles in Maharashtra State.

DATABASE AND METHODOLOGY:

The present research work is entirely based on secondary data. Data from Road Transport Year Books published by the Ministry of Road Transport and Highways; and Economic Survey Reports published by the Government of Maharashtra have been used for statistical analysis. In this research paper, a period of 60 years (1961 to 2021) has been considered for the study of road growth, both at state and national level. 50 years (1971 to 2021) data is used for statistical analysis of motor vehicles in Maharashtra and India. The data is processed and presented through appropriate maps, tables and graphs. The entire discussion of this research paper is divided into two major parts. Part first discusses the growth of road network in Maharashtra and India. Second part contains growth of motor vehicles in the state.

In this study, the following formulas have been used for statistical analysis-

1. Road Density–

$$\text{Road Density} = \frac{\text{Total Road Length (km)}}{\text{Total Geographical Area (sq.km)}} \times 1000$$

2. Motor Vehicle Density by Population-

$$\text{Vehicles Per Thousand Persons} = \frac{\text{Number of Motor Vehicles}}{\text{Total population}} \times 1000$$

3. Motor Vehicle Density by Road Length-

$$\text{Vehicles Per Kilometer Road Length} = \frac{\text{Number of Motor Vehicles}}{\text{Total Road Length (km)}}$$

4. Growth Rate of Road Length and Number of Motor Vehicles –

$$\text{Growth Rate} = \frac{\text{Current Value} - \text{Previous Value}}{\text{Previous Value}} \times 100$$

5. Average Growth Rate –

$$\text{Average Growth Rate} = \frac{\text{Growth Rate}}{\text{Current Value Year} - \text{Previous Value Year}}$$

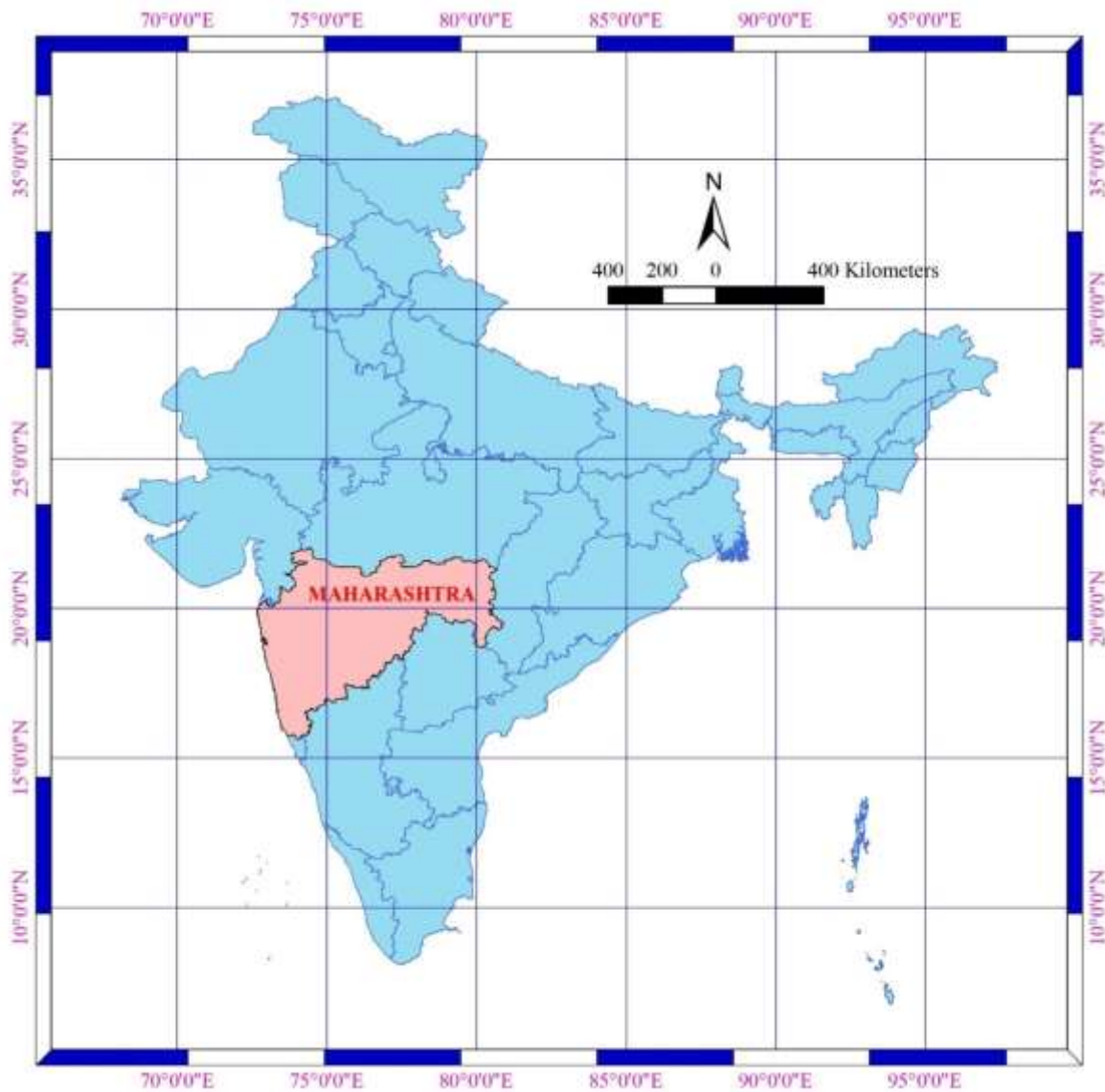
STUDY AREA:

The name Maharashtra means 'great state or nation'. The state of Maharashtra is one of the 28 states of India. This linguistic state came into existence as an independent state on 1 May 1960. It is the third largest state in India in terms of area. It is located in the western and central parts of India and covers a large part of the Deccan Plateau in the Indian Peninsula. Administratively, the state is made up of 36 districts in six administrative zones.

Profile of Study Area (Maharashtra State)

1. Establishment of State	1 st May 1960
2. Location	State in Western and Central Part of India
3. Extent	
Latitudinal	15 ^o 48' North to 22 ^o 06' North
Longitudinal	72 ^o 36' East to 80 ^o 54' East
4. Length and Width	
Length (East-West)	870 km
Width (North-South)	680 km
5. Total Area	307713 km ² (9.36% of India) (3 rd Rank in India)
6. Boundaries	Northwest- Gujarat

	North- Madhya Pradesh East- Chhattisgarh Southeast- Telangana South- Karnataka Southwest- Goa West- Arabian Sea (720 km Coastline)
7. Topographical Regions	The Konkan Coastal Strip The Sahyadri or The Western Ghat The Maharashtra Plateau
8. Climate	Tropical Monsoon (Hot and Dry)
Rainfall	135 cm (annual average)
Temperature	25°C to 27.5°C (annual ranges)
9. Major Rivers	Godavari, Krishna, Tapi, Bhima, Wainganga, Koyna
10. Soil Types	Black, Laterite, Alluvial, Red, Marshy and Peat
11. Natural Vegetation Type	Tropical Dry Deciduous
Forest Area	61907 km ² (20.11% of Maharashtra)
12. Administrative Set-Up	(2021)
Administrative Divisions	6
Number of Districts	36
Tahsils	355
Towns	534
Inhabited Villages	40959
Un-Inhabited Villages	2709
13. Population	(Census 2011) (Projected 2021)
Total	112374333 129877541
Male	58243056.51 (83%) 67468852 (51.95%)
Female	54131277 (48.17%) 62408689 (48.05%)
Rural	61556074 (54.78%) 68303286 (52.59%)
Urban	50818259 (45.22%) 61574255 (47.41%)
14. Transport	(2021)
Railway Route Length	6242.14 km
Total Road Length	323115 km
Motor Vehicles	38636247

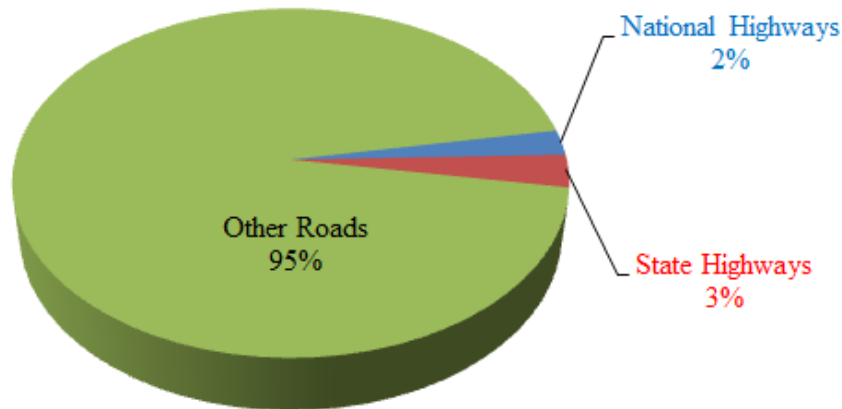
Map-1: Location of Study Area (Maharashtra State) in India

ANALYSIS AND DISCUSSION:**Road Transport in India:**

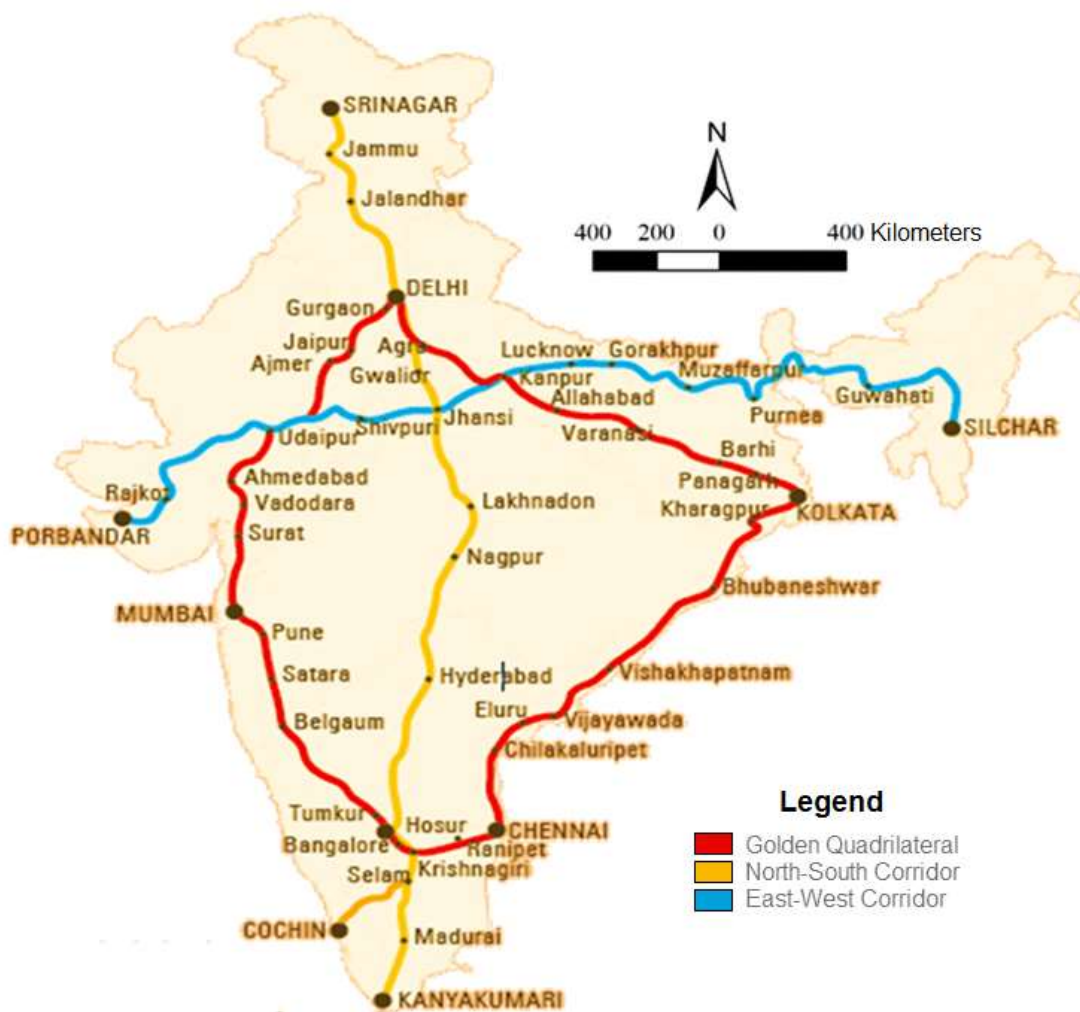
Road transport is the most economical and dominant mode of transport in India as well as in Maharashtra for the movement of goods and passengers. It is important for traffic share and contribution to the economy. It also plays a key role in helping equitable socio-economic development. It has the highest share of passenger and freight traffic compared to other modes of transport.

India's transport sector is large and diverse; it caters to the needs of 1.4 billion people. The road network of India comprises of National Highways, State-Highways, District Roads, Rural Roads, Urban Roads and Project Roads of over 63.73 lakh km of roads as on 30 November 2022, which is the second-largest in the world, after the United States of America.

Fig-1: Share of National and State Highways of India: 2021



Map-2: Major Highways in India



In India, the length of roads is continuously increasing. In 1961 the length of roads was 524478 km which in 2021 reached 6215797 km. During the period 1961-2021, the length of roads increased about 12 times. But the decadal growth rate of roads shows a continuous decline from 1961-71 to 2011-21. The decennial growth rate of roads was 74.5% in 1961-71. It increased to 62.3% in 1971-81, 56.7% in 1981-91, 45.0% in 1991-01, 38.6% in 2001-11 and 32.9% in 2011-21.

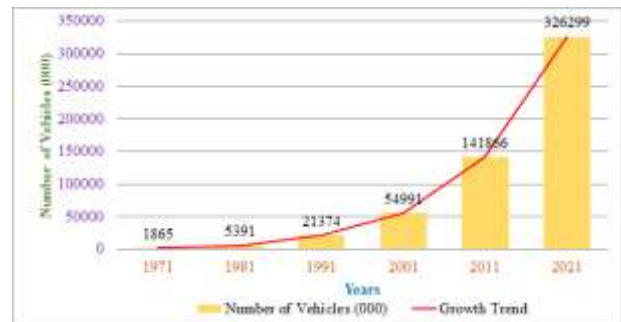
Since 1971, the number of motor vehicles registered in India has been steadily increasing. The total number of registered motor vehicles increased from 1.86 million in 1971 to 326.3 million in 2021. Therefore, the number of registered motor vehicles per km. of road length has also increased over the years.

Amongst all categories of registered motor vehicles in India, two-wheelers accounted for the highest number, and followed by Cars, Jeeps and Taxis. Buses are the main mass transport vehicles on the roads.

Fig-2: Length of Roads in India



Fig-3: Number of Registered Motor Vehicles in India



Road Network in Maharashtra:

The road network in Maharashtra plays a crucial role in the movement of people and goods. Maharashtra state has India's most extensive road network, along with the highest number of National Highways. Most of the places of the state have well-maintained state and national highways. Over the years, the road network has been steadily improving through the construction of new roads and the upgradation of existing roads.

According to 2021 data, the total length of roads in Maharashtra state is 323115 km. The total length of roads is 105 km per hundred sq km of geographical area and 248 km per lakh population.

Category-Wise Roads- The road network of Maharashtra includes four types of roads - National Highways, State Highways, District Roads, Rural or Village Roads.

- National Highways (NH):** National highways are maintained by the National Highways Authority of India (NHAI). These roads are typically designed for long-distance travel and the efficient movement of goods and people. Maharashtra has an extensive network of national highways. The total length of national highways in the state is 18089 km.
- State Highways (SH):** State highways are the responsibility of the state government. They connect important cities, towns, and industrial centers within the state. State highway network in Maharashtra is vast and covers various regions. The total length of state highways in Maharashtra is 32288 km.
- District Roads (DR):** District roads connect smaller towns and villages within districts. The total length of district roads in Maharashtra is 114758 km.
- Rural / Village Roads:** Village Roads are the smallest category of roads and provide connectivity within rural areas and between villages. They are maintained by local village panchayats or rural development authorities. The length of rural roads in Maharashtra is 157980 km.

Maharashtra has the largest network of national and state highways in India. It alone covers 13.26% of the total length of National Highways and 18.26% of the total length of State Highways in India. National Highways accounted for 5.60% of the total road length of the state as of 2020-21. The rest of the road network consists of State Highways (9.99%), District Roads (35.52%), and Rural Roads (48.89%). During the period 1961-2021, the share of National and State Highways in the total road length of Maharashtra State has always been higher than the share of National and State Highways in the total road length of the country. Also, except for 1961, the share of district roads is higher than the national average.

Table-1: Length and Share of Roads in Maharashtra and India

Road Category	Year	1961	1971	1981	1991	2001	2011	2021
National Highways	Maharashtra (km)	2312	2445	2945	2959	3688	4376	18089
	% to Total Roads in State	5.89	3.74	2.09	1.71	1.70	1.81	5.60
	% To NH in India	9.72	10.26	9.30	8.79	6.39	6.17	13.26
	India (km)	23798	23838	31671	33650	57737	70934	136440
	% to Total Roads in India	4.54	2.61	2.13	1.45	1.71	1.52	2.20
State	Maharashtra (km)	9804	14203	18949	30975	33212	34103	32288

Highways	% to Total Roads in State	24.98	21.73	13.43	17.91	15.31	14.11	9.99
	% To SH in India	NA	25.02	20.08	24.33	25.14	20.81	18.26
	India (km)	NA	56765	94359	127311	132100	163898	176818
	% to Total Roads in India	NA	6.20	6.35	5.47	3.92	3.50	2.84
District Roads	Maharashtra (km)	18012	28696	50637	77509	90447	96833	114758
	% to Total Roads in State	45.90	43.90	35.88	44.81	41.69	40.06	35.52
	% To DR in India	0.02	0.02	0.01	0.01	0.01	0.00	0.01
	India (km)	257125	276833	421895	509435	736001	998895	632154
	% to Total Roads in India	49.02	30.26	28.40	21.89	21.82	21.36	10.17
Rural Village Roads	Maharashtra (km)	9114	20020	68600	61522	89599	106400	157980
	% to Total Roads in State	23.23	30.63	48.61	35.57	41.30	44.02	48.89
	% To VR in India	3.74	3.59	7.32	3.71	3.66	3.09	3.00
	India (km)	243555	557543	937496	1656966	2447682	3443111	5270385
	% to Total Roads in India	46.44	60.94	63.11	71.20	72.56	73.62	84.79
Total	Maharashtra (km)	39242	65364	141131	172965	216946	241712	323115
	% To India	7.48	7.14	9.50	7.43	6.43	5.17	5.20
	India (km)	524478	914979	1485421	2327362	3373520	4676838	6215797
	% to Total India	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Fig.-4: Category-Wise Roads in Maharashtra State: 1961-202

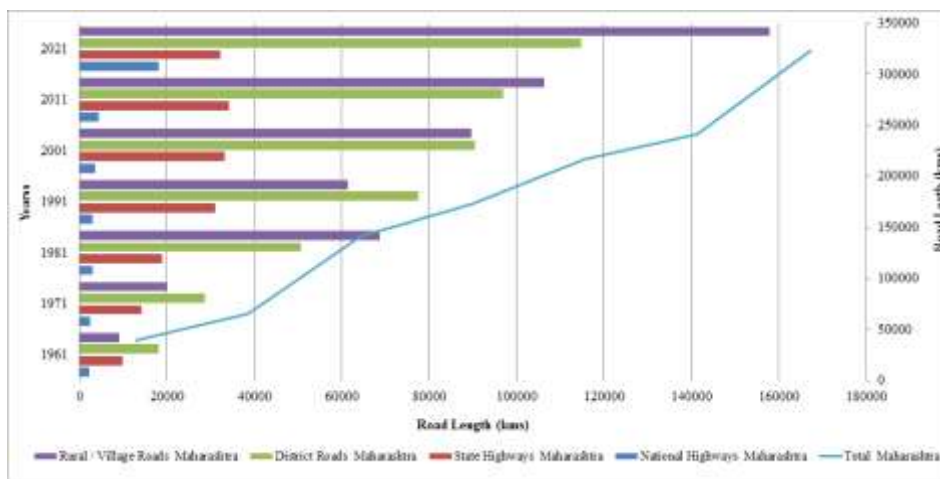
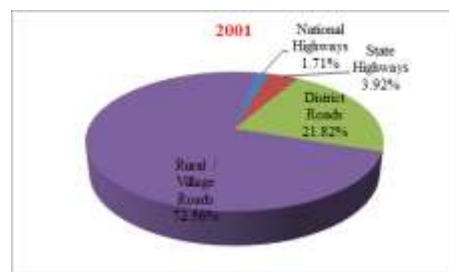
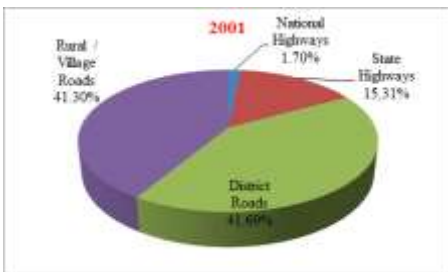
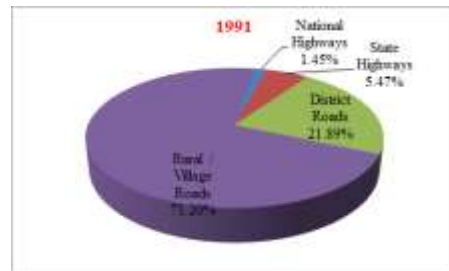
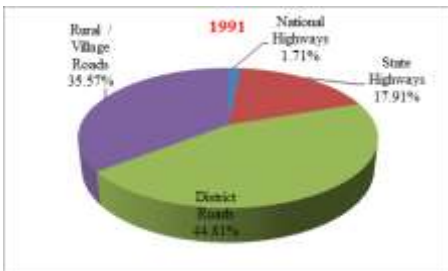
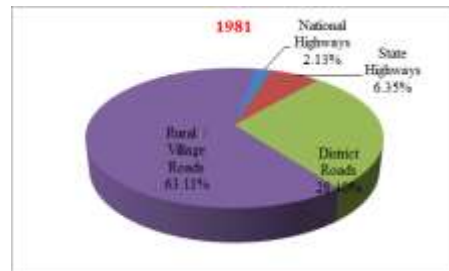
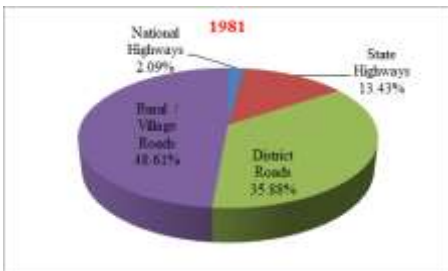
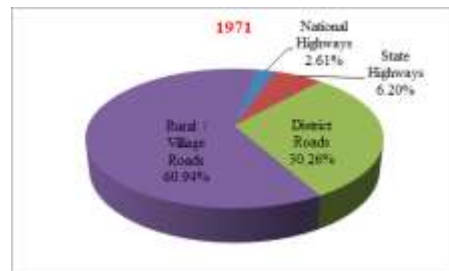
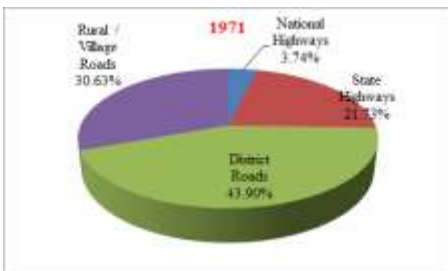
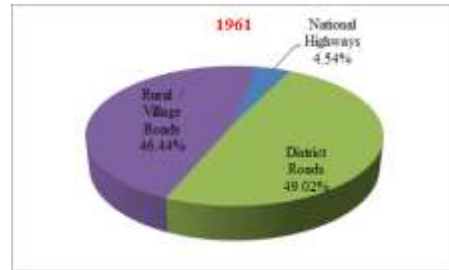
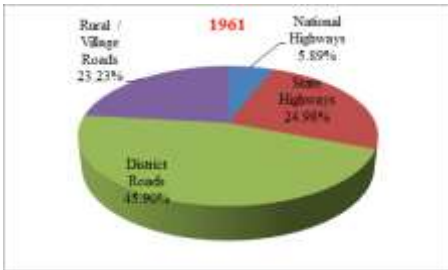
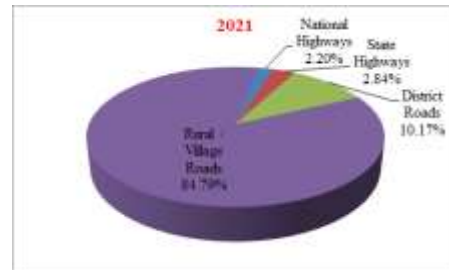
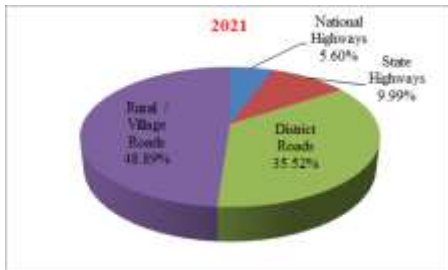
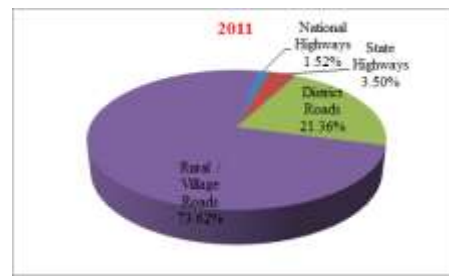
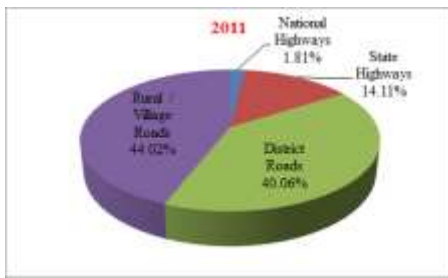


Fig.-5: Share of Roads in Maharashtra and India

Maharashtra

India





Growth of Roads- The total length of roads in Maharashtra state increased from 39242 km in 1961 to 323115 km by 2021. Over 60 years (1961-2021), the length of roads in the state increased by about 12% per year. But the annual growth rate of roads in Maharashtra is relatively low compared to India (18%). During the study period, the growth rate of national highways and district roads in Maharashtra is higher than the growth rate of national highways and district roads in the country, while the growth rate of state highways and rural roads is lower than the country. In 1961, the total length of national highways in Maharashtra was 2312 km, which increased to 18089 km in 2021. During the period 1961-2021, the number of state highways increased more than three times while the number of district roads increased more than six times.

Category-Wise Roads in Administrative Divisions- According to 2021, Pune administrative division has the longest length of roads in Maharashtra while Amravati division has the shortest length of roads. In the state, Pune division has 22.53% roads while Amravati division has 9.05% roads. The length of roads in Aurangabad (20.93%) and Nashik (21.15%) divisions is close to that of Pune and has more roads than Konkan and Nagpur divisions. Aurangabad division has the longest length of national highway (25.07% of the state) and Konkan division has the shortest length of national highway (8.67% of the state). 21.61% of the total state highways in the state are in Nashik division. In the state, Konkan division has the shortest length of district roads (8.69% of the state) while Amravati division has the shortest length of rural roads (6.57% of the state).

Table-2: Administrative Division-Wise Share of Roads in Maharashtra: 2021

Administrative Division	National Highways (%)	State Highways (%)	District Roads (%)	Rural / Village Roads (%)	Total Roads (%)
1. Amravati	13.24	14.11	10.42	6.57	9.05
2. Aurangabad	25.07	19.87	21.44	20.31	20.93
3. Konkan	8.67	12.17	8.69	12.64	10.98
4. Nagpur	15.17	12.27	15.19	16.12	15.36
5. Nashik	15.67	21.61	21.24	21.61	21.15
6. Pune	22.17	19.98	23.01	22.75	22.53
Total	100.00	100.00	100.00	100.00	100.00

Map-3: Category-Wise Roads in Administrative Divisions of Maharashtra: 2021

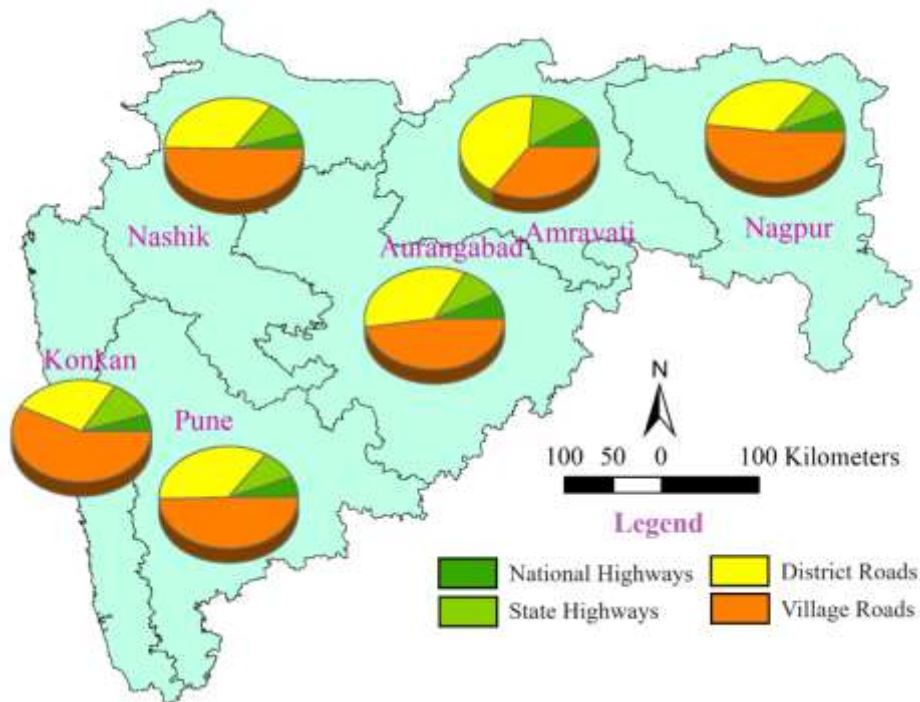


Fig.-6: Total Length of Roads (km) in Different Districts of Maharashtra State: 2021

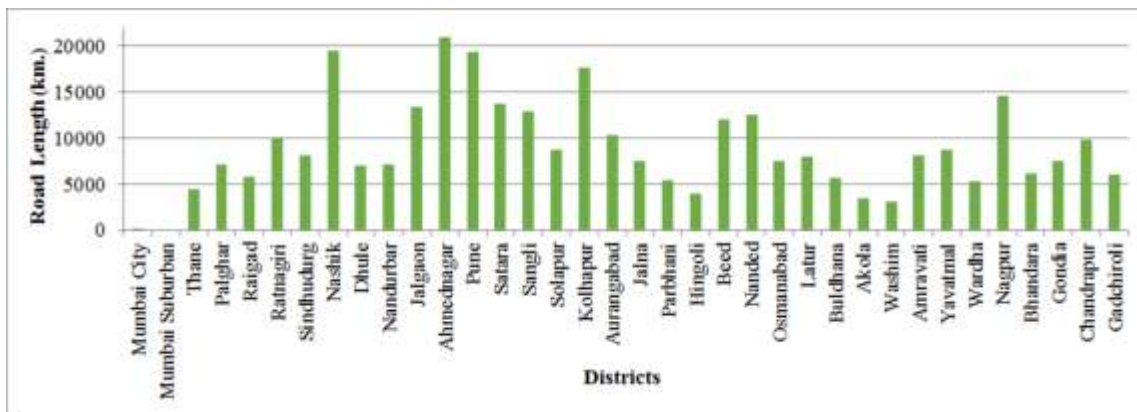


Fig.-7: Length of National Highways (km) in Different Districts of Maharashtra State: 2021

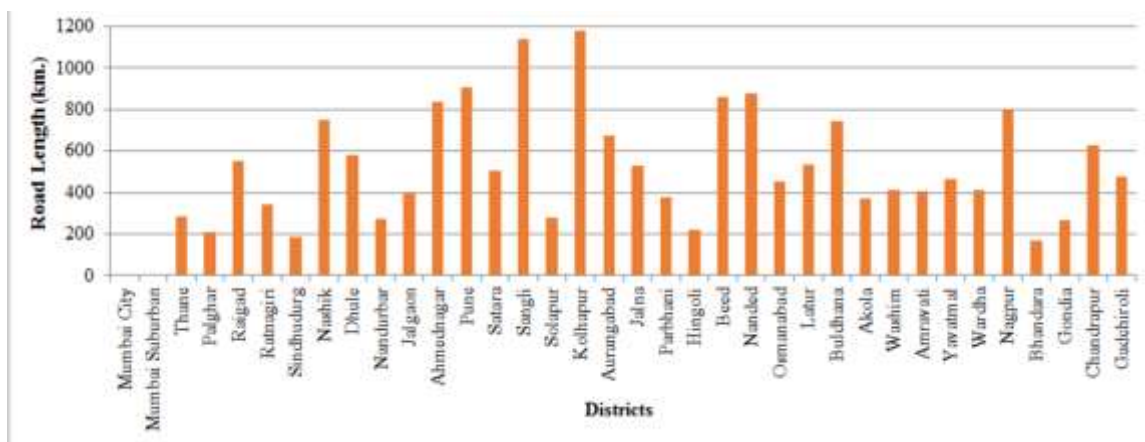
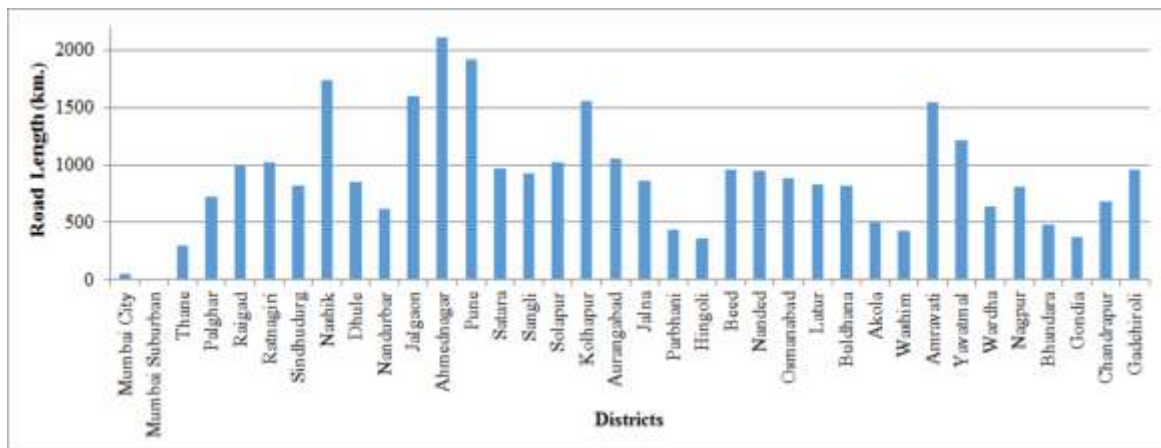


Fig-8: Length of State Highways (km) in Different Districts of Maharashtra State: 2021

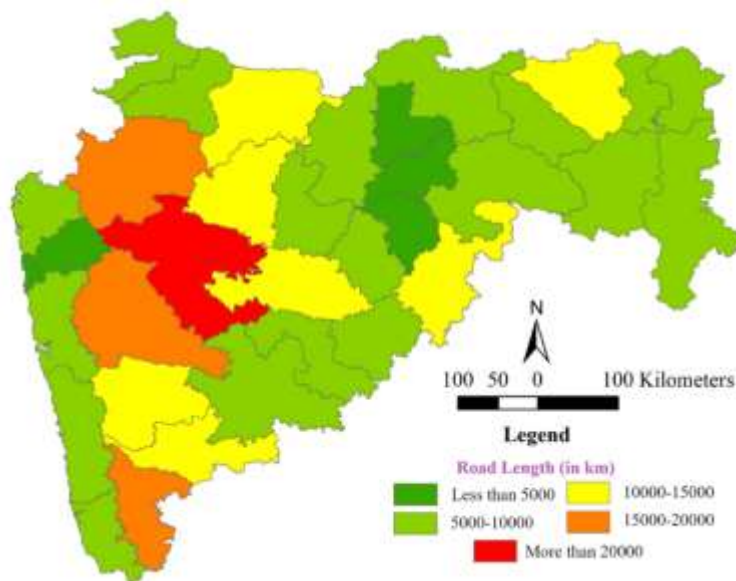


District-Wise Roads- Out of 36 districts of Maharashtra, 11 districts have more than 10000 km of roads. Ahmednagar district has the longest roads (about 21000 km) in the state. The shortest length of roads in the state (about 50 km) is in Mumbai city and Mumbai suburban. The number of national highways is highest in Kolhapur district (6.51% of the total national highways in the state) while the number of state highways is highest in Ahmednagar district (6.58% of the total state highways in the state).

Table-3: District-Wise Length of Roads in Maharashtra: 2021

Total Road Length (km)	Number of Districts	Districts
More than 20000	1	Ahmednagar
15000-20000	3	Nashik, Pune, Kolhapur
10000-15000	7	Nagpur, Satara, Jalgaon, Sangli, Nanded, Beed, Aurangabad
5000-10000	19	Ratnagiri, Chandrapur, Solapur, Yavatmal, Amravati, Sindhudurg, Latur, Osmanabad, Jalna, Gondia, Nandurbar, Palghar, Dhule, Bhandara, Gadchiroli, Raigad, Buldhana, Parbhani, Wardha,
Less than 5000	6	Thane, Hingoli, Akola, Washim, Mumbai City, Mumbai Suburban

Map-4: District-Wise Length of Roads in Maharashtra: 2021



Road Density- From 1961 to 2021, road construction in Maharashtra increased steadily, so the road density in Maharashtra increased from 127.5 per 1000 sq km in 1961 to 1050.05 per 1000 sq km in 2021. A similar upward trend is observed in road density in India.

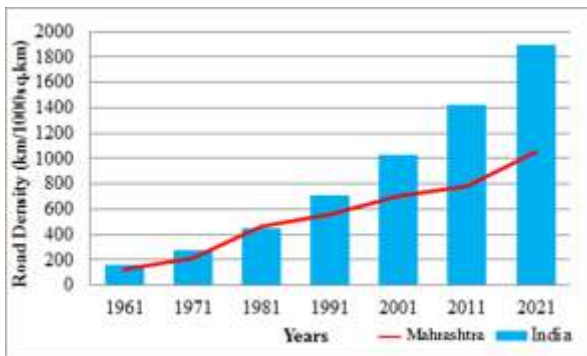
Table-4: Road Density in Maharashtra and India (Road Length (km) Per 1000 sq.km)

Year	National Highways		State Highways		District Roads		Rural / Village Roads		Total	
	Maharashtra	India	Maharashtra	India	Maharashtra	India	Maharashtra	India	Maharashtra	India
1961	7.51	7.24	31.86	NA	58.54	78.22	29.62	74.09	127.53	159.55
1971	7.95	7.25	46.16	17.27	93.26	84.21	65.06	169.61	212.42	278.34
1981	9.57	9.63	61.58	28.70	164.56	128.34	222.94	285.19	458.64	451.87
1991	9.62	10.24	100.66	38.73	251.89	154.97	199.93	504.06	562.10	707.99
2001	11.99	17.56	107.93	40.19	293.93	223.89	291.18	744.60	705.03	1026.24
2011	14.22	21.58	110.83	49.86	314.69	303.87	345.78	1047.41	785.51	1422.71
2021	58.79	41.51	104.93	53.79	372.94	192.30	513.40	1603.27	1050.05	1890.87

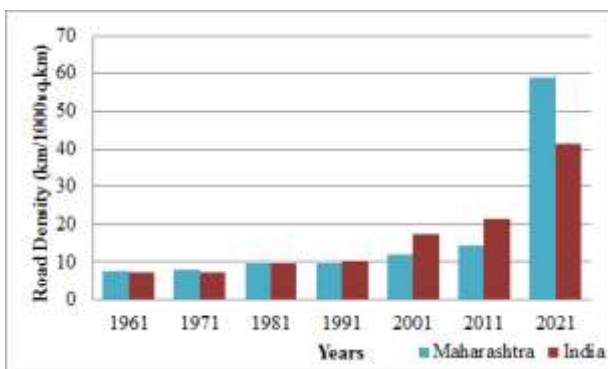
During 1961-2021, the total density of roads in Maharashtra is consistently lower than the total road density of the country, but the density of national highways, state highways and district roads in the state is always higher than the density of national highways, state highways and district roads in the country.

Fig.-9: Road Density in Maharashtra and India

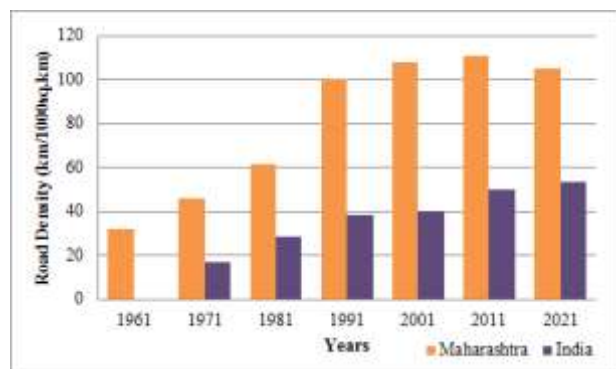
All Type of Roads



National Highway

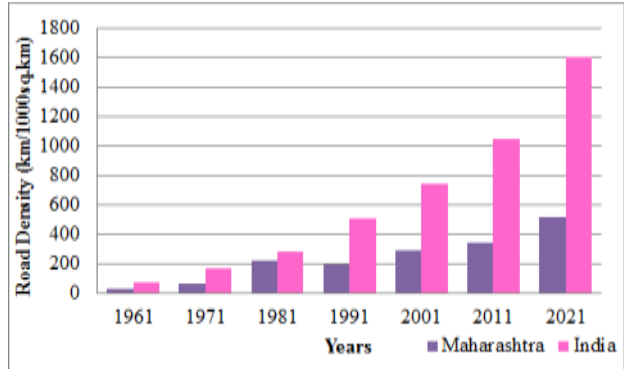
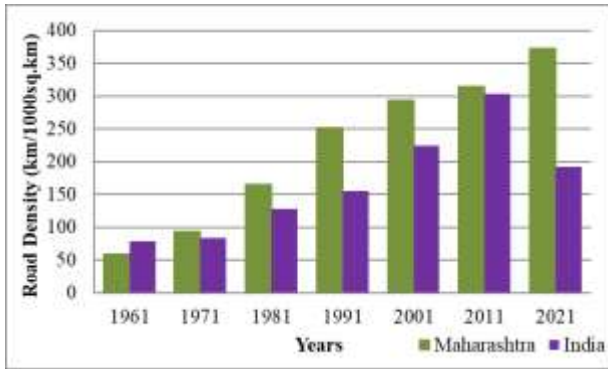


State Highway



District Roads

Village Roads



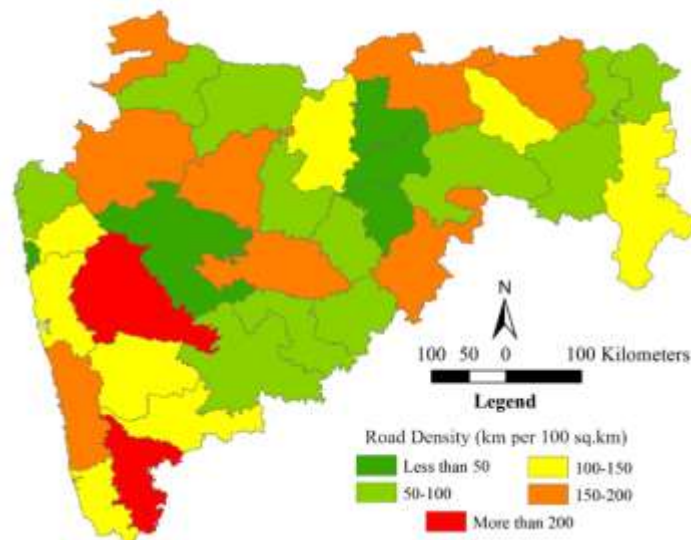
District-Wise Road Density-

Fig.-10: Road Density of Different Districts in Maharashtra State: 2021



In 2021, the total road density in the state of Maharashtra was 105 km per 100 sq km. Out of the 36 districts of the state, 17 districts have road density higher than the total road density of the state of Maharashtra while 19 districts have less than the total road density of the state. The highest road density in the state is 229 km per 100 sq km in Kolhapur district and the lowest is 8 km per 100 sq .km in Mumbai city and Mumbai suburban.

Map-5: District-Wise Road Density in Maharashtra: 2021

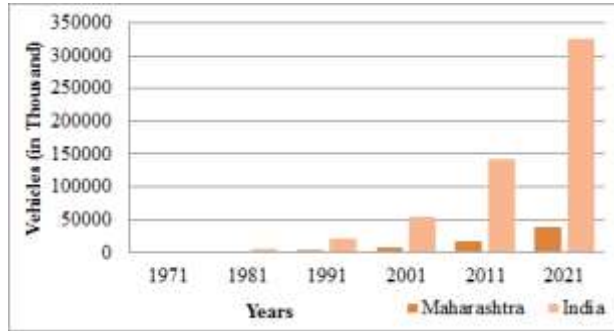


Registered Motor Vehicles in Maharashtra:

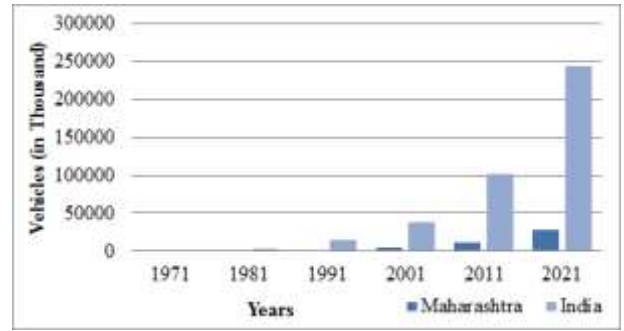
Maharashtra has the largest number of registered transport and non-transport vehicles in India. About 12% of the vehicles in the country are in Maharashtra. Vehicle registration has been steadily increasing over the last ten years. The total number of motor vehicles on road in Maharashtra State as on 1st January, 2023 is 4.33 crore showing an increase of about 5.8 percent over the previous year. Of the total registered motor vehicles in the State,

Fig.11: Number of Motor Vehicles in in Maharashtra and India

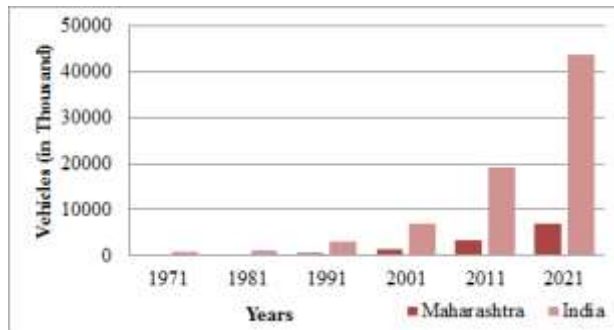
All Type of Motor Vehicles



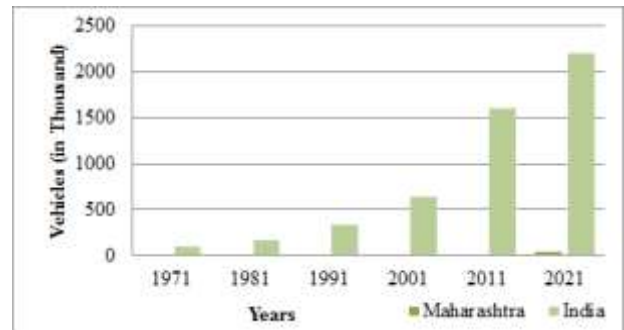
Two Wheelers



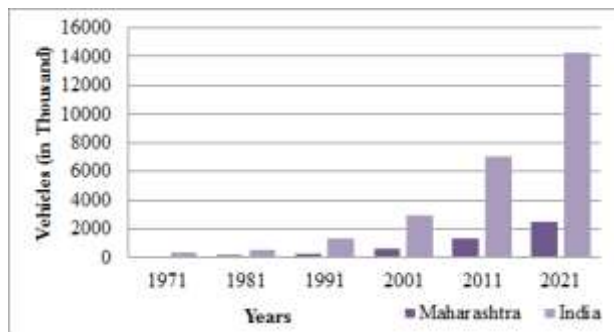
Car, Jeep, Taxi etc.



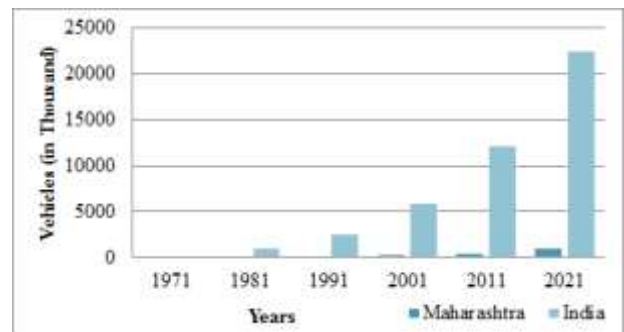
Buses



Goods Vehicles



Other Vehicles

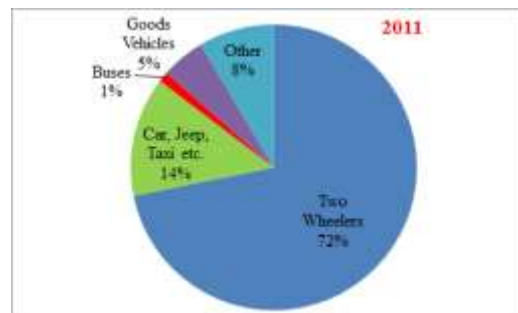
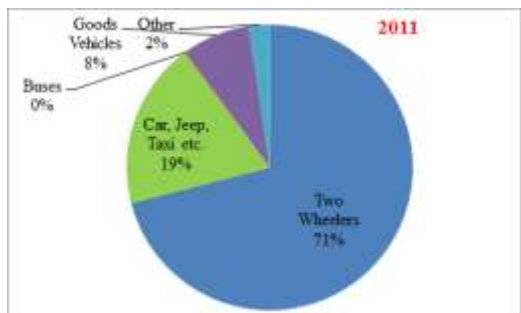
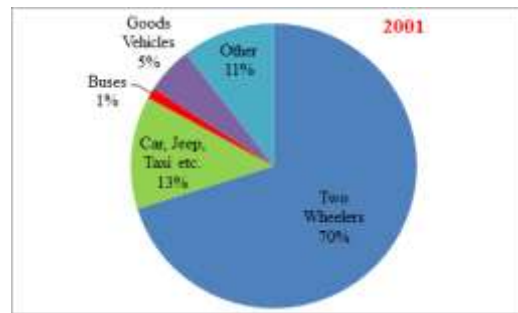
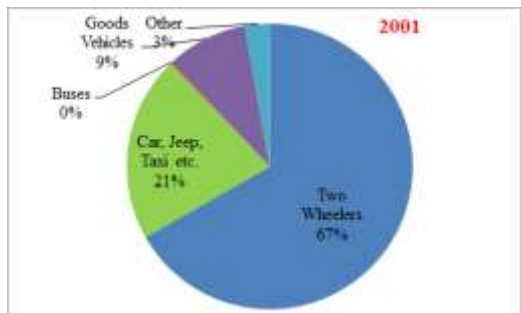
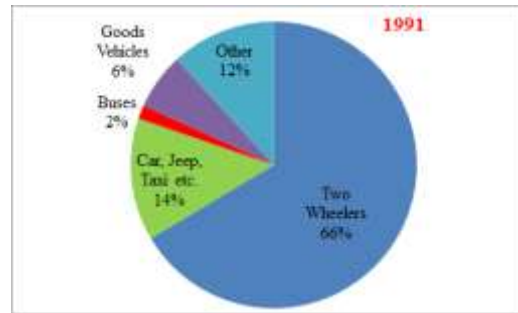
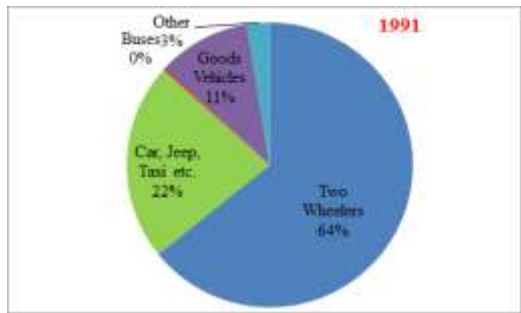
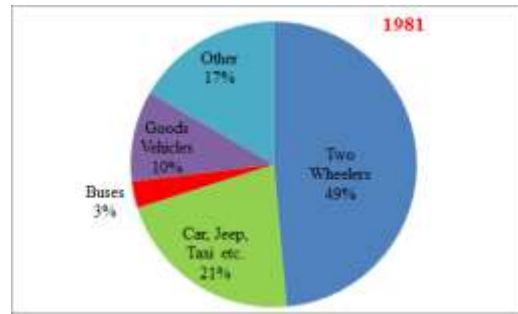
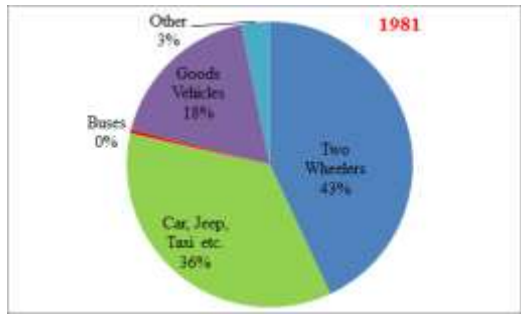
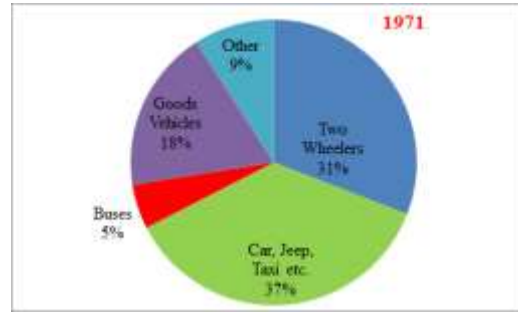
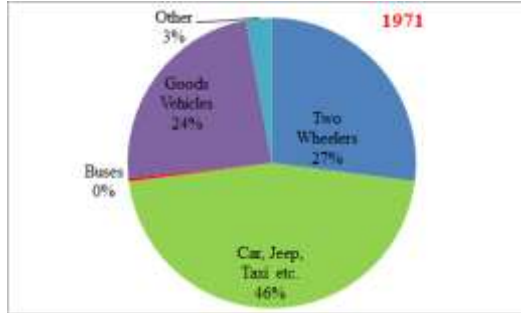


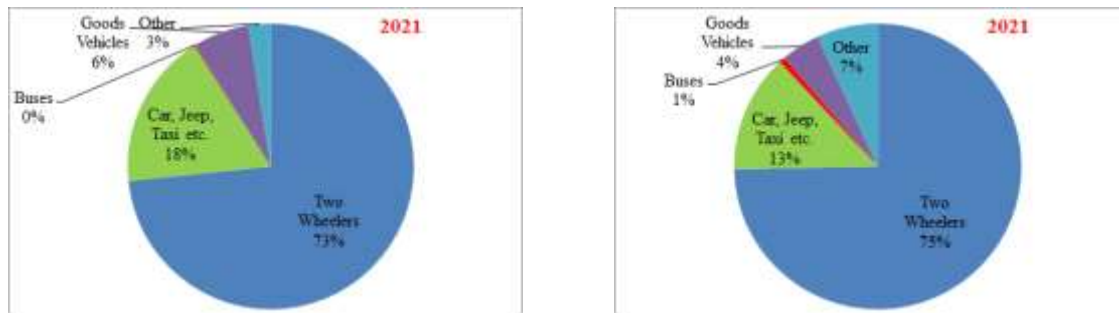
Category-Wise Motor Vehicles- Category-wise share of motor vehicles in Maharashtra and India are shown in Fig.-12. Since 1981, the share of two-wheelers in the total number of vehicles in Maharashtra and India has always been high. Since 1971 to 2021, the percentage of two-wheelers and buses in the state of Maharashtra has always been lesser than the percentage of two-wheelers and buses in India. But the share of goods vehicles and cars, jeeps, taxis in total vehicles in the state is more than India's share.

Fig.-12: Category-Wise Share of Motor Vehicles in Maharashtra and India

Maharashtra

India





Transport and Non-Transport Vehicles in Administrative Divisions- The table-6 shows the statistics of motor vehicles in six administrative divisions of the state of Maharashtra in the year 2021. Accordingly, among the six administrative divisions, Pune administrative division has the highest number of motor vehicles (30.18% of the total motor vehicles in the state) while Amravati division has the lowest number (6.66% of the total motor vehicles in the state). The number of motor vehicles transporting goods and passengers is highest in Konkan division (41.92% of the total transport vehicles in the state) and lowest in Nagpur division (6.85% of the total transport vehicles in the state).

Table-6: Administrative Division-Wise Share of Vehicles in Maharashtra: 2021

Administrative Division	Transport Vehicles (%)	Non-Transport Vehicles (%)	Total Vehicles (%)
1. Amravati	5.17	6.81	6.66
2. Aurangabad	11.69	11.43	11.45
3. Konkan	41.92	24.64	26.20
4. Nagpur	6.85	11.18	10.79
5. Nashik	11.07	15.08	14.72
6. Pune	23.30	30.86	30.18
Total	100.00	100.00	100.00

Note:

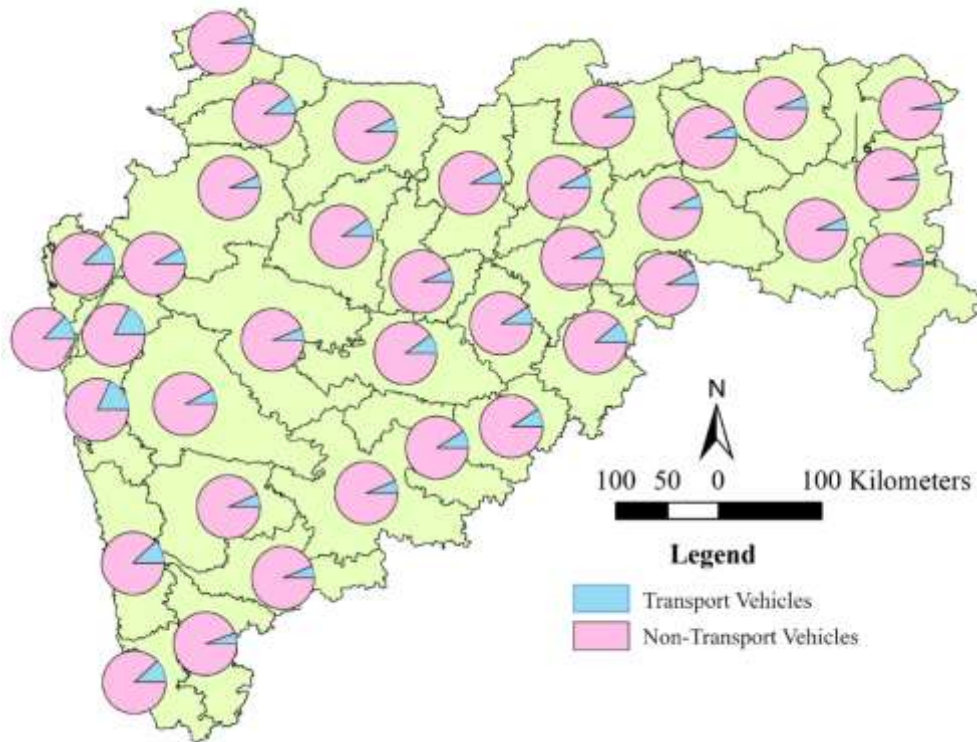
1. Non Transport Vehicles- Two wheelers, Motor cars, Jeeps, Tractors, Trailers & Others
2. Transport Vehicles- Taxi cabs, Auto rickshaws, Stage Carriages, Contract Carriages, School Buses, Ambulances, Trucks & Lorries, Tankers, Delivery Van

District-Wise Motor Vehicles- According to the 2021 records, among the total 36 districts of Maharashtra, Pune district has the highest number of motor vehicles while Gadchiroli district has the lowest number of motor vehicles. Thane district has the highest number of commercial passenger and goods transport vehicles, while Pune district has the highest number of private vehicles. The number of vehicles per km of road length is highest in Mumbai city and Mumbai suburbs districts while lowest in Gadchiroli district.

Table-7: District-Wise Number of Motor Vehicles in Maharashtra: 2021

Total Number of Vehicles	Number of Districts	Districts
More than 250000	4	Pune, Thane, Mumbai Suburban, Nagpur
200000-250000	1	Nashik
150000-200000	3	Ahmednagar, Kolhapur, Aurangabad
100000-150000	6	Solapur, Mumbai City, Satara, Jalgaon, Sangli, Raigad
50000-100000	8	Amravati, Nanded, Palghar, Chandrapur, Latur, Yavatmal, Dhule, Buldhana
Less than 50000	14	Akola, Beed, Jalna, Ratnagiri, Parbhani, Wardha, Gondia, Osmanabad, Bhandara, Washim, Sindhudurg Nandurbar, Hingoli, Gadchiroli

Map-6: Share of Transport and Non-Transport Vehicles in Maharashtra: 2021



Motor Vehicle Density- Motor Vehicle density is defined in terms of number of motor vehicles per thousand persons and number of vehicles per km of road length. From 1971 to 2021, the number of motor vehicles per thousand persons has increased steadily in Maharashtra and has always been higher than India. In the study period (1971 to 2021), the number of motor vehicles per thousand persons increased by about 50 times. The number of motor vehicles per road km in the state was 5 in 1971 as against only 2 in the country. It increased to 120 in the state and 52 in the country in 2021.

Fig.-13: Number of Motor Vehicles per Thousand Persons in Maharashtra and India

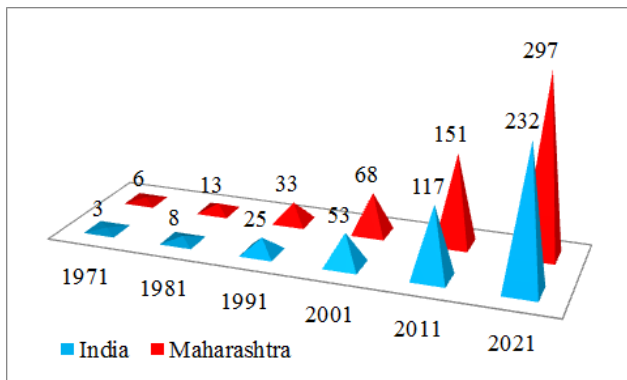


Fig.-14: Number of Motor Vehicles per Kilometer Road in Maharashtra and India

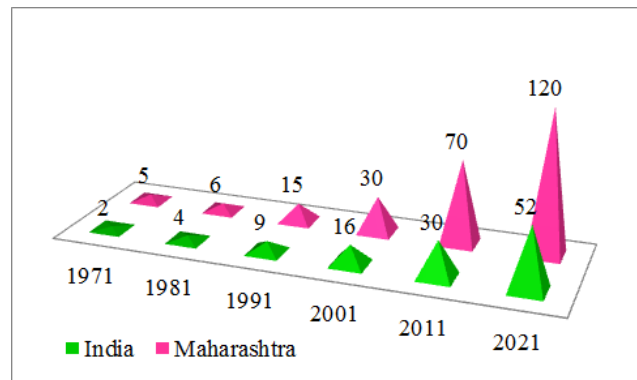


Table-8: Vehicle Density in Maharashtra and India

Region	Year	1971	1981	1991	2001	2011	2021
Maharashtra State	Number of Motor Vehicles	311769	804986	2640585	6607064	16989659	38636247
	Population	50412235	62782818	78937187	96878627	112374333	129877541
	Road Length (km)	65364	141131	172965	216946	241712	323115
	Motor Vehicles per thousand of persons	6	13	33	68	151	297
	Number of Motor Vehicles per km. road length	5	6	15	30	70	120
India	Number of Motor Vehicles	1865000	5391000	21374000	54991000	141866000	326299000
	Population	548159652	683329097	846302688	1028610328	1210854977	1407563842
	Road Length (km)	914979	1485421	2327362	3373520	4676838	6215797
	Motor Vehicles per thousand of persons	3	8	25	53	117	232
	Number of Motor Vehicles per km. road length	2	4	9	16	30	52

District-Wise Motor Vehicle Density- In 2021, the number of motor vehicle per kilometer road length in the state of Maharashtra was 120. Out of the 36 districts of the state, 10 districts have vehicle density higher than the total motor vehicle density of the state of Maharashtra while 26 districts have less than the total motor vehicle density of the state. The highest vehicle density in the state found in Mumbai city and Mumbai suburban district and the lowest in Gadchiroli District.

Map-7: District-Wise Vehicle Density in Maharashtra: 2021

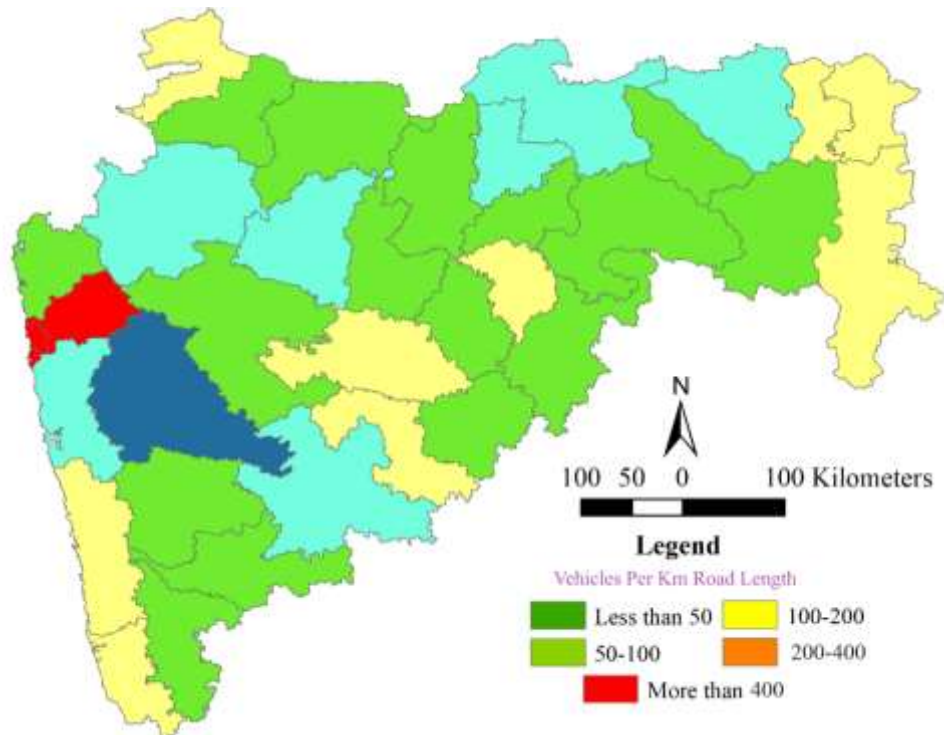
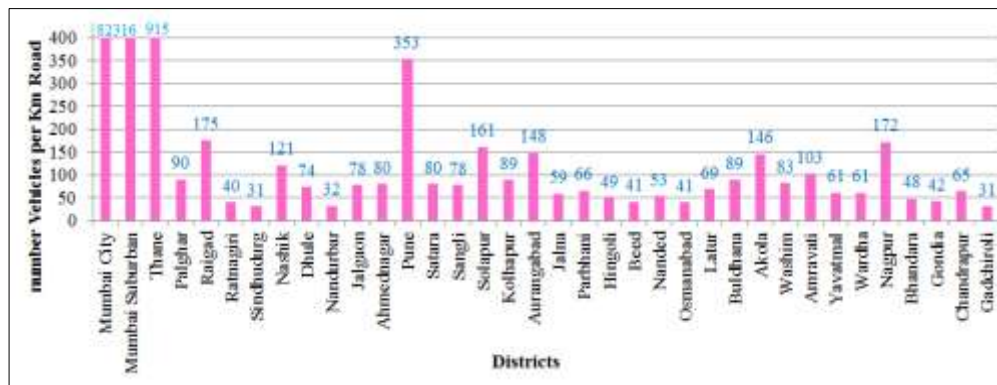


Fig-15: Vehicle Density of Different Districts in Maharashtra State: 2021



CONCLUSIONS:

1. The road network and the number of motor vehicles in the state of Maharashtra are growing at a slow rate compared to India.
2. The decennial growth rate of roads in India was 74.5% in 1961-71. It increased to 62.3% in 1971-81, 56.7% in 1981-91, 45.0% in 1991-01, 38.6% in 2001-11 and 32.9% in 2011-21.
3. The total number of registered motor vehicles in India increased from 1.86 million in 1971 to 326.3 million in 2021.
4. According to 2021 data, the total length of roads in Maharashtra state is 323115 km. The total length of roads is 105 km per hundred sq km of geographical area and 248 km per lakh population.
5. During the study period (1961-2021) Maharashtra has the largest network of national and state highways in India. It alone covers 13.26% of the total length of national highways and 18.26% of the total length of state highways in India.
6. According to 2021, Pune administrative division has the longest length of roads in Maharashtra while Amravati division has the shortest length of roads.
7. Among the 36 districts of Maharashtra, Ahmednagar district has the longest length of roads in the state (about 21000 km) and Mumbai city and Mumbai suburban districts have the shortest length of roads in the state (about 50 km).

8. The road density in Maharashtra increased from 127.5 km per 1000 sq km in 1961 to 1050.05 km per 1000 sq km in 2021.
9. The density of national highways, state highways and district roads in Maharashtra state is always higher than the density of national highways, state highways and district roads in the country (India).
10. During the 50 years (1971-2021), the number of motor vehicles in Maharashtra state increased by about 248% annually.
11. Since 1971 to 2021, the percentage of two-wheelers and buses in the state of Maharashtra has always been lesser than the percentage of two-wheelers and buses in India. But the share of goods vehicles and cars, jeeps, taxis in total vehicles in the state is more than India's share.
12. The number of motor vehicles transporting goods and passengers is highest in Konkan division (41.92% of the total transport motor vehicles in the state) and lowest in Nagpur division (6.85% of the total transport motor vehicles in the state).
13. According to the 2021 records, among the total 36 districts of Maharashtra, Pune district has the highest number of motor vehicles while Gadchroli district has the lowest number of motor vehicles.
14. From 1971 to 2021, the number of vehicles per thousand persons has increased steadily in Maharashtra and has always been higher than India.
15. Out of the 36 districts of the state, 10 districts have motor vehicle density higher than the total motor vehicle density of the state of Maharashtra while 26 districts have less than the total motor vehicle density of the state.

In short, during the study period, total and district-wise number of motor vehicles and length of roads are increasing rapidly in Maharashtra state.

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