

CHAPTER 21

ROADS

21.1 Road network provides the arterial network to facilitate trade, transport, social integration and economic development. It is used for the smooth conveyance of both people and goods. Transportation by road has the advantage over other means of transport because of its easy accessibility, flexibility of operations, door-to-door service and reliability. Consequently, passenger and freight movement in India over the years have increasingly shifted towards roads vis-a-vis other means of transport. In 2009-10, the road network in the country carried 85.2 per cent of the total passenger movement by roads and railways put together. Similarly, the corresponding figure for freight movement by roads was 62.9 per cent.

International Comparison of Road Network:

21.2 Road networks across countries can be compared in terms of road density (length of road per square km of area) so that the size effect may be neutralized. However, it is expected that smaller countries would have higher road density than those with considerably larger size. Accordingly, the geographic coverage of India's highway network at 1.42 km of road length per square km of land is denser than that of USA (0.67 km/sq km), and much higher than that of China (0.40 km/sq. km) and Brazil (0.21 km/sq. km). In India, expressways/motorways are around 227 km, while China's highway network consists of over 65,055 km of access controlled expressway, linking the major cities.

21.3 However, in lot of countries all the roads are paved e.g. USA, UK & France whereas even countries like Japan & Korea have higher percent of paved roads (80%) compared to India where the same is 53.83 per cent. Population & vehicular penetration in different countries may also be taken into account while comparing the road networks. While India leads in the former (second only to China) it lags behind in latter (specially in case of four wheelers)

Major Road Indicators Across select Countries

Major Road Indicators across Select Countries					
Country	Road Density (km/sq km)	Share of Paved Road (%)	Road Length in Kilometre		
			Total	Motorways	National Highways
1	2	3	4	5	6
Brazil	0.21 (2004)	N.A.	17,51,868 (2004)	0	93,071 (5.31)
China	0.40 (2009)	53.50 (2008)	38,60,823 (2009)	65,055 (1.69)	59,462 (1.54)
France	1.73 (2009)	100.00 (2009)	9,51,260 (2009)	11,240 (1.18)	9,020 (0.95)
India	1.42 (2011)	53.83 (2011)	46,90,342 (2011)	227 (0.005)	70,934 (1.51)
Japan	3.20 (2009)	80.11 (2009)	12,07,867 (2009)	7,642 (0.63)	54,790 (4.54)
Korea, Republic	1.05 (2009)	79.25 (2009)	1,04,983 (2009)	3,776 (3.60)	13,819 (13.16)
Russian Federation	0.06 (2009)	80.06 (2007)	9,82,000 (2009)	N.A.	N.A.
South Africa	0.30 (2001)	17.30 (2001)	3,64,131 (2001)	239 (0.07)	2887 (0.79)
United Kingdom	1.72 (2009)	100.00 (2009)	4,19,665 (2009)	3,674 (0.88)	49,032 (11.68)
United States of America	0.67 (2009)	100.00 (2009)	65,45,839 (2009)	75,643 (1.16)	19,857 (0.30)

Sources: For India – Transport Research Wing, Ministry of Road Transport & Highways
For all other countries – ‘World Road Statistics 2011’, published by International Road Federation, Geneva.
Figures in parentheses in columns 2, 3 and 4 refer to the calendar year while in columns 5 and 6, figures in parentheses indicate the percentage share of the category in total road length.
N.A.: Information not available.

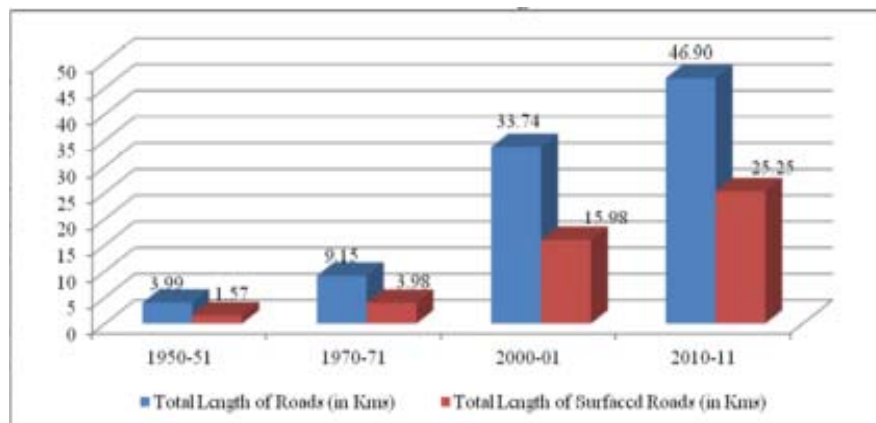
21.4 Expansion of Road Network vis-à-vis growth in Motor Vehicles: Burgeoning population and increasing vehicular penetration /traffic density are placing increasing demands on expansion of the road networks in India. The growth of road network has not kept pace with the growth in the number of registered vehicles . While the number of registered motor vehicles has grown at a CAGR of 10.6 per cent between 1951 and 2011, the growth in the road network during the same period was 4.2 per cent. During the last decade, 2001 to 2011, the number of registered motor vehicles recorded a CAGR of 9.9 per cent, while the road network increased at a CAGR of 3.4 per cent .

Compound Annual Growth Rates (in %) of Registered Motor Vehicles and Road Length: 1951 to 2011

Period	Vehicles						Roads					
	Two - Wheelers	Cars, Jeeps & Taxis	Buses	Goods Vehicles	Others*	Total	NHs	SHs & OPWD	Rural	Urban	Project	Total
1	2	3	4	5	6	7	8	9	10	11	12	13
2011/1951	14.5	8.1	6	7.6	14.1	10.6	2.1	3.2	4.4	-	-	4.2
1961/1951	12.5	6.9	5.3	7.4	26.5	8.1	1.9	4.0	-0.5	-	-	2.7
1971/1961	20.7	8.2	5.1	7.4	15.0	10.9	0.0	2.6	6.0	4.5	-	5.7
1981/1971	16.3	5.4	5.6	4.9	18.1	11.2	2.9	4.5	5.9	5.5	3.5	5.0
1991/1981	18.4	9.8	7.4	9.4	10.9	14.8	0.6	2.1	7.2	4.3	1.2	4.6
2001/1991	10.5	9.1	6.7	8.1	8.6	9.9	5.5	3.1	4.6	3.0	0.6	3.8
2011/2001	10.2	10.5	6.9	9.1	8.0	9.9	2.1	3.0	3.4	5.0	2.6	3.4

* : Others include tractors, trailers, three wheelers (passenger vehicles)/LMV and other miscellaneous vehicles which are not separately classified.

21.5 Growth in Road Length : The total road length in India increased more than 11 times during the 60 years between 1951 and 2011. From 3.99 lakh kilometre as on 31 March 1951, the road length increased to 46.90 lakh kilometres as on 31 March 2011 (Chart 1). Concomitantly, the surfaced road length increased both in absolute and relative terms. The length of surfaced roads which was 1.57 lakh kilometres (39.35 per cent of total road length) as on 31 March 1951 increased to 25.25 lakh kilometres (53.83 per cent of total road length) as on 31 March 2011.

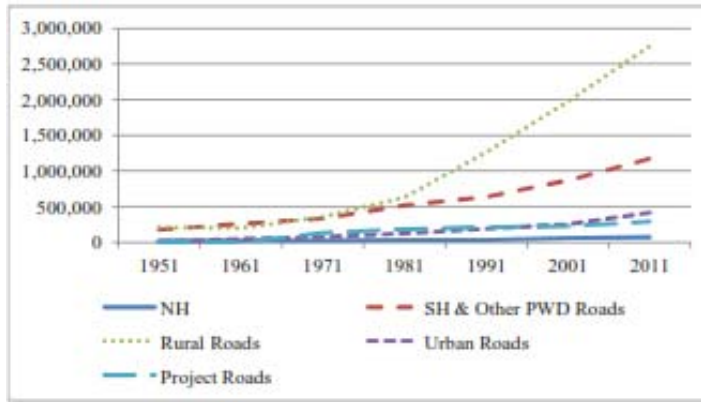


21.6 Surfaced road length in the country has expanded both in absolute and relative terms. While the total surfaced road length in India as on 31 March 2009 was 23.24 lakh kilometres, as on 31 March 2010 and 2011, the corresponding figures were 24.33 lakh kilometres and 25.25 lakh kilometres, respectively. Surfaced road length as a proportion of the total road network in the country increased from 51.98 per cent as on 31 March 2009 to 53.09 per cent as on 31 March 2010 to 53.83 per cent as on 31 March 2011.

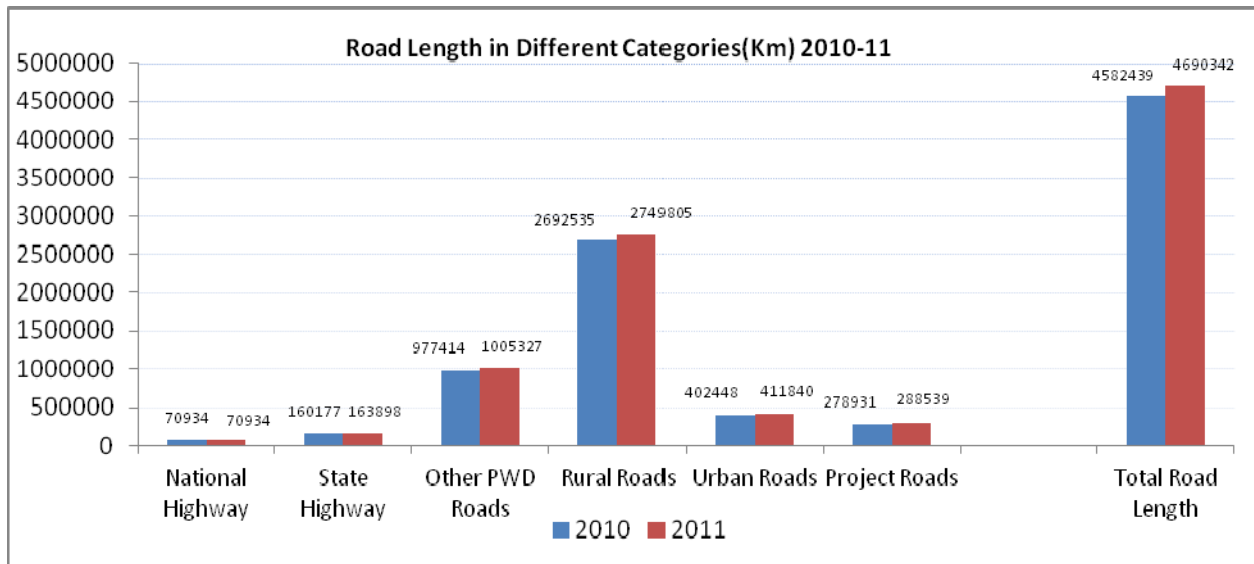
21.7 Category wise Growth in Road Length : The length of National Highways rose from 19,811 kilometres as on 31 March 1951 to 70,934 kilometres as on 31 March 2011 reflecting a compound annual growth rate (CAGR) of 2.1 per cent during the period. During the same period, the combined network of State Highways and Other Public Works Department (PWD) posted a seven-fold expansion in length. The combined length of State Highways and Other PWD roads stood at 11.69 lakh kilometres as on 31 March 2011. The highest CAGR of 4.4 per cent during 1951 to 2011 was registered by rural roads comprising Panchayati roads, and roads constructed under Jawahar Rozgar Yojana (JRY) and Pradhan Mantri Gram Sadak Yojana (PMGSY). The length of rural roads increased more than 13 times from 2.06 lakh kilometres in 1951 to 27.50 lakh kilometres in 2011. Urban roads grew by a CAGR of 4.5 per cent between 1961 and 2011. Their length stood at 4.12 lakh kilometres as on 31 March 2011. The length of Project roads grew by CAGR of 2 per cent during 1971 and 2011 and was 2.88 lakh kilometres as on 31 March 2011.

Road Network by Categories (in kilometres): 1951 to 2011							
Road Category	1951	1961	1971	1981	1991	2001	2011
1	2	3	4	5	6	7	8
National Highways	19,811 (4.95)	23,798 (4.54)	23,838 (2.61)	31,671 (2.13)	33,650 (1.45)	57,737 (1.71)	70,934* (1.51)
State Highways	1,73,723 (43.44)	257,125 (49.02)	56,765 (6.20)	94,359 (6.35)	1,27,311 (5.47)	1,32,100 (3.99)	1,63,898 (3.49)
Other PWD Roads	^	^	2,76,833 (30.26)	4,21,895 (28.40)	5,09,435 (21.89)	7,36,001 (21.82)	10,05,327 (21.43)
Rural Roads	2,06,408 (51.61)	197,194 (37.60)	3,54,530 (38.75)	6,28,865 (42.34)	12,60,430 (54.16)	19,72,016 (58.46)	27,49,805 (58.63)
Urban Roads	0 (0.00)	46,361 (8.84)	72,120 (7.88)	123,120 (8.29)	186,799 (8.03)	252,001 (7.12)	411,840 (8.78)
Project Roads	0 (0.00)	0 (0.00)	1,30,893 (14.31)	1,85,511 (12.49)	2,09,737 (9.01)	2,23,665 (6.32)	2,88,539 (6.15)
Total	3,99,942	5,24,478	9,14,979	14,85,421	23,27,362	33,73,520	46,90,342
Note: Figures within parentheses indicate per cent to total road length in each road category. *76,818 kilometres as on 31 st March 2012 ^ Included in State Highways							

Growth in Road Length by categories: 1951:2011



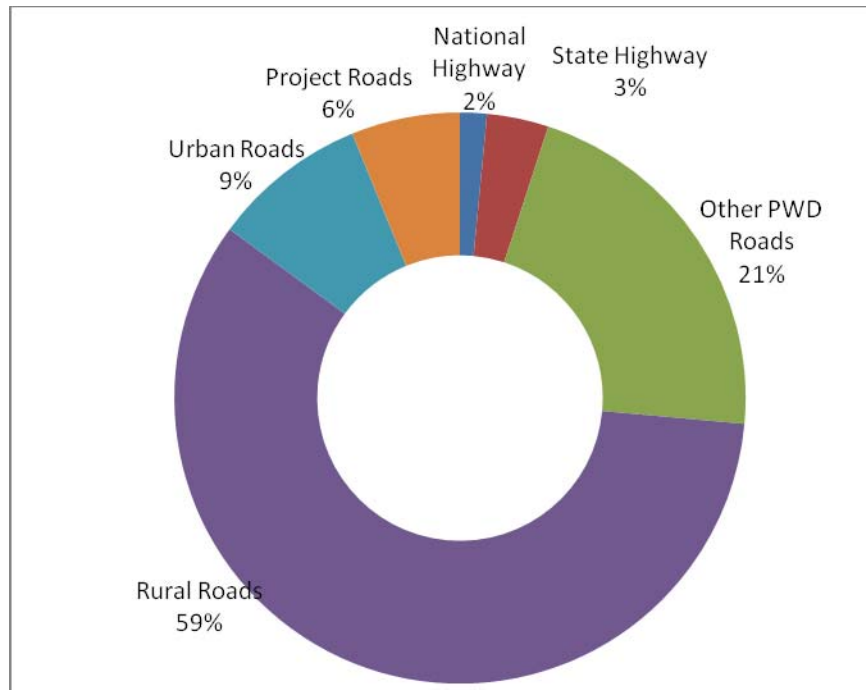
21.8 **Annual Increase in Road length in various categories** : More than 1 lakh Km (1,07,903 Km) of roads were constructed over the one year period i.e. 2010-11. More than half of the addition was in rural roads category (57,270 Km) and little over a quarter in the category of other PWD roads (27,913Km).



21.9 Road Network in Terms of Broad Categories :

Rural roads with about 59 % share in the total road length continue to constitute the major share . National Highways, though constitute small proportion of total road length, run across the length and breadth of the country and carry significant amount (40%) of road traffic. State Highways & other PWD roads constitute secondary system of road transportation in the country.

Road Length by categories 2011



Government Initiatives:

21.10 Ministry of Road Transport & Highways, and apex organization under the Central Government, is entrusted with the task of formulating and administering, in consultation with other Central Ministries/Departments, State Governments/UT administrations, organizations and individuals, policies for Road Transport, National Highways and Transport Research with a view to increasing the mobility and efficiency of the road transport system in the country.

The National Highways development Project (NHDP)

21.11 The largest highway project ever undertaken in the country is being implemented by the **National Highways authority of India (NHAI)**.

21.12 National Highway Development Project (NHDP) is targeted at the Golden Quadrilateral i.e. Delhi, Kolkata, Chennai & Mumbai (length 5846 Km) and North South i.e. Kashmir to Kanyakumari (4000Km) and East west Corridors i.e. Silchar to Porbandar (3300 Km).

21.13 As per National Highways Authority of India, out of the 5846 Km length of Golden Quadrilateral, the task for 6/4 laning has been completed for 5844 Km (99.98%) as on 31st October 2012 & out of 7142 Km of NS-EW corridors, task of 6/4 laning has been completed for 6041 Km. Taking

together allocation under various phases of NHDP (till NHDP Phase VII) out of 47,096 km road length, 17,480 Kms have already been 4/6 laned and work for 13,268 Km is under implementation . Contract for balance of 16,347 Kms is to be awarded

21.14 **Source of Information on Road Statistics : Transport Research Wing , Ministry of Road Transport & Highways**, brings out various annual publications like Basic Road Statistics of India, Road Transport Year Book & Road Accidents in India. The publications contain on Road length, national highways, state highways, other Public Work Departments roads, rural roads, urban roads, project roads etc including state wise break up . Information on expenditure is also available. The publications can be downloaded from the website of the Ministry www.morth.nic.in

Acknowledgement : The information available in **Basic Road Statistics of India, 2009-11**, Ministry of Road Transport & Highways , has been used extensively in the Chapter. Information on Progress of NHDP has been taken from website of NHAI.