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PREFACE

The country has witnessed an unprecedented and undreamt of changes in the economic sphere in the last decade or so, resulting in almost complete economic freedom for the people. The sweeping economic reforms have overhauled the economic scenario, causing jubilation all-around. Many things which were once a monopoly of the rich have become a common man's commodity. For example, in the past, telephones were found only in the houses of rich and middle classes, but, today, even a common man is going around with a mobile phone in his hand. The elixir of economic freedom can be enjoyed by each and every one in immense quantity if the fruits of economic reforms can be made to reach every nook and corner of our country. This calls for not only improving the basic infrastructural facilities like water, power, roads, in all our towns and villages, but also maintaining them properly.

Uninterrupted power and water supplies along with good internal roads in a town go a long way in not only improving the quality of life of the inhabitants but also attract both foreign and domestic investments. However, today, there are wide disparities among our cities and towns with regard to availability of basic infrastructural facilities and services, both in terms of quantity and quality. Municipal roads constitute an important basic infrastructure, but, unfortunately, the condition of municipal roads in many of our towns and cities is far from satisfactory. Such towns which do not have proper municipal road network with satisfactory maintenance may fail to attract investments in them and, therefore, may lag far behind in the economic race ushered in by the economic reforms. There is, therefore, a crying need to give more attention to municipal roads. Hence, in this report the present scenario of municipal roads, both at state and city levels, have been highlighted and recommendations have also been made to reduce the inter-town disparities. The minimum expenditure that would be required to improve the condition of municipal roads has also been worked out.

I would like to place on record my appreciation of the team of officers and staff led by Sh. J. Nagarajan, Senior Social Scientist, for bringing out this report for the benefit of local bodies. The responsibility of drafting the report was shared by Sh. J. Nagarajan, Senior Social Scientist, Sh. H.L. Poddar, Research Officer, Smt. Nilima Verma, Research Officer, Sh. C.A. Lokesh and Sh. P.P. Tuteja. Sh. B.D. Kapoor, Sh. R.S. Meena, Smt. Aruna Pathak and Sh. Tarcitus Tete were involved in the collection, compilation, scrutiny and computerization of data. Sh. S.K. Arora prepared the maps that have gone into this report. Secretarial assistance was rendered by Smt. Amarjeet Kaur.

It is hoped that this report would be useful for policy-makers, administrators, urban planners, researchers, and, particularly, the agencies involved in the development, construction and maintenance of municipal roads.

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New Delhi
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CHAPTER I

Introduction

The economic scenario of India has undergone a sea-change since the early nineties. It is no more a closed economy where a few capitalists could thrive. The economic reforms which began in the early nineties have afforded every Indian to become a capitalist. Liberalization, privatization, globalization, computerization, fiscal reforms are the keywords that are being liberally used in the corridors of power. The quota, license and permit raj is fading away. Many of the sectors which were hitherto the monopoly of the state have been thrown open to the private sector. The key sectors like telecommunication and power have already been opened to the private sector. Even railways are being opened to the private sector. Today, every Indian seems to be enjoying the economic freedom. Yes, capitalism has been democratized. Capitalism is no more a monopoly in India.

India always possessed the spiritual and political strength and with the ushering in of economic reforms, its economic strength is also growing day by day and the day is not far off when it would become the economic giant of the world. However, the urban problems that may escalate in the near future due to speedier economic growth should not be lost sight of. Since, globalization and liberalization will attract huge foreign investment and also increase domestic investment, there is an urgent need to improve all types of economic and social infrastructure of our cities and towns. If urgent attention is not given for improving infrastructural facilities in our towns and cities, the flow of foreign investment may go down, affecting adversely the economic growth.

Roads constitute an important infrastructure and thereby an important element in economic development. Good roads are indispensable for easier movement of vehicles and pedestrians and to ensure easy accessibility. A town having good network of internal roads and accessible by good roads will develop faster. Every settlement, whether it is an urban or rural area, should have a good network of all weather internal roads, so that even during heavy rains, the flow of traffic on roads is smooth and unhindered. A good and wide road network within a country is indispensable to achieve balanced regional development.

In relation to population, the position of road development in India is definitely deplorable when compared to many of the developed countries of the world. India's position can be easily ascertained from the figures given in Table1. It may be seen from Table 1 that in India the road length in relation to population is not even one-fifth of that of the U.S.A. When compared to Australia, which occupies the top position, India's road length per million of population is not even one-tenth of that of Australia. All the European countries given in the table are found to be having much higher road length in relation to population than that of India. Japan's figure is observed to be more than double the figure of India. Among the 28 countries mentioned in the table, India ranks twenty second in terms of road length per million of population. The six countries which fall below India are Philippines, Mexico, Morocco, Indonesia, Pakistan and Egypt.

With regard to internal roads, i.e., roads within a city, the required data is not available to compare India with other countries of the world. However, if such data were available and the same had been analysed, it would have depicted only a dismal scenario for India. The internal roads in an urban area in India which has a municipality, are generally under the jurisdiction of the municipality and therefore are better known as municipal roads. Good municipal road network constitutes an important pre-requisite for strengthening the economic base of a city. If all the cities in the country are provided with good roads, it will pave the way for achieving the important goal of balanced regional development.

It is well known that municipal roads in many of our towns are in very bad condition. One of the major problems that confront every municipality today is the problem relating to construction and maintenance of municipal roads. There is hardly any town or city in the country today where all the municipal roads are in good condition. A large proportion of municipal roads do not have adequate widths. Many of the municipal roads get submerged during heavy rains due to lack of proper drainage system along the roads. Good roads allow smooth and fast flow of traffic, while bad roads create traffic jams, cause damage to the vehicles, give growth to environmental hazards etc. The municipal roads are in bad condition because of shortage of funds with the municipalities.There is, however, an urgent need to improve them because of the higher importance they have acquired after the ushering in of the economic reforms. It is principally because of this reason the instant study was taken up.

Table 1
Road Length in relation to Area and Population for Selected Countries 1996

S.No.	Countries	Road Length (kms)	
		Per 100sq.kms of Area	Per Million of Population
	I. AFRICA		
1	Egypt	6.39	1059.78
2	Morocco	8.53	2245.41
3	Zambia	5.27	3799.04
4	South Africa [(a)]	29.49	7048.19
	II. ASIA & MIDDLE EAST		
1	India	100.87	3664.07
2	Indonesia	19.39	1926.47
3	Japan	307.04	9206.35
4	Malaysia	28.6	4639.18
5	Philippines [(a)]	68.07	2836.11
6	Saudi Arabia	7.19	9090.91
7	Pakistan	28.23	1707.62
	III. EUROPE		
1	Austria	153.9	16031.68
2	Belgium	469.13	14119.82
3	France	161.98	15361.45
4	West Germany	254.53	7701.67
5	United Kingdom	161.75	6526.32
6	Hungary	170.52	15567.52
7	Netherlands	308.55	8099.49
8	Poland	119.93	9704.71
9	Spain	68.32	8686.32
10	Switzerland	172.25	10058.98
11	Sweden	33.57	15488.22
	IV. AMERICA		
1	United States	65.45	24044.94
2	Mexico	12.8	2769.23
3	Brazil	23.26	11856.29
4	Canada [(a)]	9.15	31618.72
	V. OCEANIA		
1	Australia	11.88	50054.82
2	New Zealand	*34.08*	25898.88

Note : (a) Relates to the year 1995

Source : "Basic Road Statistics of India – 1996-97",Ministry of Surface Transport, Govt. of India, New Delhi

Objectives of the Study

1. To know the extent of municipal road development in Class I cities and also make inter - city comparisons to highlight the extent of disparities among the cities in municipal roads, both in terms of quantity and quality.

2. To study the financial resources of the local bodies of Class I cities and the expenditure made by them on road development and assess inter - city variations in the same.

3. To assess the extent of municipal road development in various class I cities in relation to their population and areas and the inter- city variations in the same.

4. To study the expenditure on road development in relation to its total length within the city, population of the city and area of the city, in various Class - I cities, and also know the inter - city variations in the same.

5. To study the adequacy of financial resources of the local bodies of Class I cities in relation to road development and also highlight the inter-city variations in the same.

6. To ascertain the various problems encountered by municipal bodies with regard to road development and make recommendations.

Methodology

Keeping in view the objectives of the study and the data that was required to fulfill the objectives of the study, a detailed proforma seeking information on various aspects such as financial resources, area, population, road length, expenditure on roads etc., was prepared for collecting the required information and copies of this proforma were mailed to the concerned states and local bodies. A copy of the proforma can be seen in Appendix I. The data received from the local bodies form the basis of the instant report.

Coverage

Though all the class-I towns were proposed to be covered, but due to poor response from the states this ambition remain unfulfilled. Among the 414 towns which were required to send us the data, only 102 towns (about 24%) responded. On scrutiny of the data received from those which responded, it was observed that data pertaining to many towns was either incomplete or found to have many inconsistencies. Hence, in the present report, the towns that have been selected for analysis differ from variable to variable. In the third chapter which deals with road length in class I cities, the data received from only 96 towns out of 102 has been analysed. The expenditure on municipal roads has been analysed in Chapter IV and in this chapter, the data received from only 79 towns were found suitable for analysis. In chapters 5 and 6, where municipal income has been analysed, the data pertaining to only 58 towns has been used.

Chapterisation

The report has been divided into nine chapters including this introductory chapter. The second chapter deals with the surface quality of municipal roads in various states and union territories and in the country as a whole. In the third chapter surface quality of municipal roads in 96 towns has been analysed. Fourth chapter deals with municipal expenditure in 79 towns, whereas in the firth and sixth chapters, data relating to municipal income received from 58 towns has been analysed. The estimated costs of strengthening of municipal roads in various states and union territories and in the country as a whole are presented in chapter VII. Chapter VIII deals with estimated costs of strengthening of municipal roads in some of the class I towns. The last chapter, i.e., chapter 9 gives findings and recommendations.

CHAPTER II

Surface Quality of Municipal Roads in States and Union Territories

Cities are widely recognized as engines of economic growth. The importance of urban transportation in shaping urban development and its quality need hardly be stressed. Except for very large cities, where rail-based systems would be an additional requirement, transport needs of cities are to be met basically by provision of road infrastructure. As evident from the census surveys, the urbanization in our country has been growing steadily for the past several decades. While it was 10.84 percent in 1901, it rose to 27.78 percent in 2001. The total number of towns has also increased from 1915 in 1901 to 5161 in 2001. Another important feature of this urbanization trend is the rapid growth of Million Plus Cities. In 1951, there were only 5 such cities. In 1991, the number of million-plus cities was 23 which increased to 35 in 2001.

Urbanisation is growing not only in terms of number of towns and population but also in terms of areas of existing towns. Such a situation naturally results in putting more pressure on the public transport which in turn make people depend more on taxis, auto rickshaws and private cars and scooters. The increasing number of vehicles in our cities and towns definitely call for better urban/municipal roads. It is high time to give serious thought to the need for having better urban roads in cities to enable the increasing volume of traffic to move smoothly and safely.

Length of Municipal Roads

A road within the limits of the area of a Municipality and which is maintained by the concerned Municipality is regarded as a Municipal road. Municipal roads can be broadly classified into two categories viz., (i) surfaced roads and (ii) un-surfaced roads. Whereas un-surfaced roads are Kacha roads i.e. a road with the carriageway composed of natural soil, the surfaced roads are Pucca roads and generally found with three types of surfaces, which are explained below.

(i) *Water Bound Macadam (W.B.M.)* : A type of surfacing in which sten fragments are find interlocked by rolling and then bound

with smaller stone gravel etc., which in-forced into the interstices by brooming, watering and rolling.

(ii) *Black Top Surface (B.T.)* : In this case the surface of roads is made with tar bitumen as a binder.

(iii) Cement Concrete *(C.C.)* : Here the road surface is obtained by placing and consolidating cement concrete to required thickness.

As per the "Basic Road Statistics of India – 1998-99" published by the Ministry of Road Transport and Highways, Govt. of India, the total length of municipal roads in India was 2.14 lakh kms., of which the length of surfaced and unsurfaced roads constituted 1.59 lakh kms. (74.2%) and 0.55 lakh kms. (25.8%) respectively. The state/UT-wise length of municipal roads is given in Table 2.1. The length of municipal roads varies from 30 kms in Meghalaya to 48014 kms in Uttar Pradesh. Uttar Pradesh, which is at the top with 48014 kms., is followed by Delhi (24441 kms), West Bengal (20124 kms.) and Maharashtra (17868 kms.). The table indicates that in small states like Arunachal Pradesh, Mizoram, Nagaland, Sikkim and UTs of A & N Islands, D & N Haveli, Daman & Diu and Lakshadweep, there were no municipal roads at all. This is perhaps because the local urban roads in these states are being maintained by some other agency. In Goa, Jammu & Kashmir, Manipur, Meghalaya, Tripura and Pondicherry, the length of municipal roads was observed to be less than 1000 kms. The length of roads varies between 10000 kms and 20000 kms in Andhra Pradesh, Gujarat, Kerala, Maharashtra, Orissa, and Tamilnadu. In 3 states / UT's, viz., Uttar Pradesh, West Bengal and Delhi , the length is more than 20000 kms.

In order to assess the adequacy of roads in relation to population and area, the following indicators have been worked out for each state and are presented in Table 2.2

(i) Length of surfaced municipal roads per 100 sq. km. of urban area.

(ii) Length of surfaced municipal roads per 1 lakh of urban population.

Table 2.1

Length of Municipal Roads by Type of Surface in India

As on 31st March,1999 – Statewise

(In Kms.)

S.No.	State / U.T's	Total	Surfaced				Unsur-faced
			Total	W.B.M	B.T	C.C	
1	Andhra Pradesh *(a)*	15173	11457	4533	4966	1958	3716
2	Arunachal Pradesh	N.M	N.M	N.M	N.M	N.M	N.M
3	Assam *(a)*	2512	862	172	669	21	1650
4	Bihar *(b)*	3731	1820	480	1093	247	1911
5	Goa *(c)*	675	474	38	433	3	201
6	Gujarat	12988	10048	2205	7136	707	2940
7	Haryana *(a)*	3372	2459	270	1954	235	913
8	Himachal Pradesh	1065	759	74	426	259	306
9	Jammu & Kashmir* *(a)*	441	441	2	439	0	0
10	Karnataka *(a)*	8366	6687	2265	4203	219	1679
11	Kerala	10728	7395	1356	5228	811	3333
12	Madhya Pradesh *(d)*	3750	2267	834	1292	141	1483
13	Maharashtra *(e)*	17868	12797	6000	6000	797	5071
14	Manipur	122	68	22	46	0	54
15	Meghalaya	30	26	0	1	25	4
16	Mizoram	N.M	N.M	N.M	N.M	N.M	N.M
17	Nagaland	N.M	N.M	N.M	N.M	N.M	N.M
18	Orissa *(a)*	13288	6758	3021	3142	595	6530
19	Punjab *(f)*	6399	3705	291	3259	155	2694
20	Rajasthan *(d)*	5167	2971	676	1859	436	2196
21	Sikkim	N.M	N.M	N.M	N.M	N.M	N.M
22	Tamilnadu	13978	12709	1544	9571	1594	1269
23	Tripura *(e)*	194	157	75	82	0	37
24	Uttar Pradesh *(a)*	48014	38614	17738	20876	0	9400
25	West Bengal *(g)*	20124	12757	0	12757	0	7367
26	A & N Islands	N.M	N.M	N.M	N.M	N.M	N.M
27	Chandigarh *(h)*	1469	1469	0	1469	0	0
28	D & N Haveli	N.M	N.M	N.M	N.M	N.M	N.M
29	Daman & Diu	N.M	N.M	N.M	N.M	N.M	N.M
30	Delhi *(a)*	24441	21933	4958	16975	0	2508

31	Lakshadweep	N.M	N.M	N.M	N.M	N.M	N.M
32	Pondicherry	580	536	42	479	15	44
All India		214475	159169	46596	104355	8218	55306

(a) As on 31st March,1997

(b) As on 31st March,1984

(c) As on 31st March,1995

(d) As on 31st March,1980

(e) As on 31st March,1989

(f) As on 31st March,1992

(g) As on 31st March, 1998

(h) As on 31st March, 1996

**Jammu province only*

Abbreviations :

W.B.M. : Water Bound Macadam

B.T. : Black Top

C.C. : Cement Concrete

N.M. : No Municipal Roads

Source : " Basic Road Statistics of India 1998 - 1999 ", Ministry of Road Transport & Highways, Govt.of India

Surfaced Municipal Roads in relation to Urban Area

It may be seen from Table 2.2 that the length per 100 sq.kms. of urban area ranges from a minimum of 17 kms in Meghalaya to a maximum of 1965 kms in Delhi. Chandigarh, with a length of 1883 kms., ranked next to Delhi, which was followed by Uttar Pradesh (777 kms) and West Bengal (416 kms.). Madhya Pradesh, with a length of 29 kms., occupied the place above Meghalaya. In the country as a whole, the average was 254 km. per 100 sq. km. of urban area and eight states / UTs were having ratios more than this average. These states were Delhi (1965), Chandigarh (1883), Uttar Pradesh (777), West Bengal (416), Pondicherry (351).Himachal Pradesh (281), Orissa (266) and Punjab (257).

Table 2.2
Length of Surfaced Municipal Roads (in Kms.) in relation to Urban Area and Urban Population - As on 31st March, 1999 - Statewise

S.No.	State / U.T's	Length per 100 Sq. Kms. of Urban Area*	Length per 1 lakh of Urban Popn*.
1	Andhra Pradesh *(a)*	252	64
2	Arunachal Pradesh	N.M	N.M
3	Assam *(a)*	107	35
4	Bihar *(b)*	49	16
5	Goa *(c)*	123	99
6	Gujarat	202	71
7	Haryana *(a)*	216	61
8	Himachal Pradesh	281	169
9	Jammu & Kashmir **(a)*	N.A	N.A
10	Karnataka *(a)*	168	48
11	Kerala	226	96
12	Madhya Pradesh *(d)*	29	15
13	Maharashtra *(e)*	205	42
14	Manipur	47	13
15	Meghalaya	17	8
16	Mizoram	N.M	N.M
17	Nagaland	N.M	N.M
18	Orissa *(a)*	266	160
19	Punjab *(f)*	257	62
20	Rajasthan *(d)*	62	30
21	Sikkim	N.M	N.M
22	Tamilnadu	206	67
23	Tripura *(e)*	107	37
24	Uttar Pradesh *(a)*	777	140

25	West Bengal *(g)*	416	68
26	A & N Islands	N.M	N.M
27	Chandigarh *(h)*	1883	255
28	Dadra and Nagar Haveli	N.M	N.M
29	Daman & Diu	N.M	N.M
30	Delhi *(a)*	1965	259
31	Lakshadweep	N.M	N.M
32	Pondicherry	351	104
All India		254	74

** Area and Population as per the 1991 Census*
Note : Footnotes under Table 2.1 may please be seen

The distribution of states / UTs by length of surfaced municipal roads per 100 sq kms of urban area can be seen in Table 2.3. It may be seen that in only five states / UTs, i.e. 22% of the states and UTs, the ratio is above 300 kms. In nine states / UTs (39%), namely Gujarat (202kms.), Maharashtra (205 kms.), Tamilnadu (206 kms.), Haryana (216 kms.), Kerala (226 kms.), Andhra Pradesh (252 kms.), Punjab (257 kms.), Orissa (266 kms.) and Himachal Pradesh (281 kms.), the ratio ranges between 200 and 300 kms. Only 3 states/U.T.,s (13%) namely Delhi, Chandigarh & Uttar Pradesh had more than 500 kms. of surfaced roads per 100 sq. kms. of urban area. Five states which were having less than 100 kms. of surfaced roads per 100 sq. urban area, were Meghalaya (17 kms.), Madhya Pradesh (29kms.), Manipur (47kms.), Bihar (49 kms.) and Rajasthan (62kms.).

Table 2.3
Distribution of States and U.T.'s by Length of Surfaced Municipal Roads per 100 Sq.Kms. of Urban Area - As on 31st March,1999

Range of Length in Kms.	No. States and U.T.'s	Percentage
Less than 100	5	21.7
100 - 200	4	17.4
200 - 300	9	39.1
300 - 400	1	4.3
400 - 500	1	4.3
500 & above	3	13.0
Total	23	100.0

Note : Footnotes under Table 2.1 may please be seen

Surfaced Municipal Roads in relation to Urban Population

The figures furnished in Table 2.2 indicate that the length of municipal roads per one lakh of urban population was as low as 8 kms in Meghalaya to as high as 259 kms in Delhi. The highest availability of municipal roads in Delhi can be attributed to its being the National Capital. Delhi is followed by Chandigarh (255 kms), Himachal Pradesh (169 kms),Orissa (160 kms) and Uttar Pradesh (140 kms). As may be seen from Table 2.2, the average all-India figure for length of surfaced roads per one lakh of urban population was 74 kms. The states which had higher figures than the national average were eight in number and these are Delhi, Chandigarh, Himachal Pradesh, Orissa, Uttar Pradesh, Pondicherry, Goa, and Kerala.

The distribution of states and UTs by length of surfaced municipal roads per one lakh of urban population is given in Table 2.4. The statistics given in this table show that in 15 states / UTs, i.e. about 65% of the 23 states, the ratio was less than 75 kms. Four states, viz. Bihar, Madhya Pradesh, Manipur and Meghalaya were having a ratio of less than 25 kms. The availability of municipal roads in these four states can definitely be termed as very poor.

Table 2.4
Distribution of States and U.T.'s by Surfaced Municipal Road Length per 1 lakh of Urban Population - As on 31st March, 1999

Road Length in Kms.	No.of States and U.T.'s	Percentage
Less than 25	4	17.4
25 - 50	5	21.7
50 - 75	6	26.1
75 - 100	2	8.7
100 & above	6	26.1
Total	23	100.0

Note : Footnotes under Table 2.1 may please be seen

Delhi ranked first in terms of availability of municipal roads not only in relation to urban area but also in terms of urban population. Delhi was followed by Chandigarh on both the accounts. Meghalaya occupied the last position in terms of availability of municipal roads in relation to urban area as well as in relation to urban population. Five states viz. Rajasthan, Bihar, Madhya Pradesh, Manipur and Meghalaya featured among the last five both in terms of availability in relation to urban area and urban population.

Surface Quality of Municipal Roads

It has been mentioned earlier that the length of surfaced municipal roads in the country as a whole was 1.59 lakh kms. and this formed 74.2 percent of the total length of municipal roads in the country. The state / U.T wise percentage share of each category of municipal road to total municipal road length may be seen in Table 2.5. It is observed from this table that the proportion of surfaced roads was lowest in Assam (34.3%) and highest in Jammu & Kashmir (100%) and Chandigarh(100%). Pondicherry stood next to Chandigarh and was followed by Tamilnadu. In Bihar, only about 49% of the municipal roads was surfaced and is followed by Assam.

Table 2.5
Percentage Share of Each Category of Municipal Road to Total Municipal Road Length - All India and States - As on 31st March,1999

S.No.	State / U.T's	Surfac-ed	Unsurfa-ced	W.B.M	B.T	C.C	B.T.+ C.C
1	Andhra Pradesh *(a)*	75.5	24.5	29.9	32.7	12.9	45.6
2	Arunachal Pradesh	N.M	N.M	N.M	N.M	N.M	N.M
3	Assam *(a)*	34.3	65.7	6.8	26.6	0.8	27.5
4	Bihar *(b)*	48.8	51.2	12.9	29.3	6.6	35.9
5	Goa *(c)*	70.2	29.8	5.6	64.1	0.4	64.6
6	Gujarat	77.4	22.6	17.0	54.9	5.4	60.4
7	Haryana *(a)*	72.9	27.1	8.0	57.9	7.0	64.9
8	Himachal Pradesh	71.3	28.7	6.9	40.0	24.3	64.3
9	Jammu & Kashmir* *(a)*	100.0	0.0	0.5	99.5	0.0	99.5
10	Karnataka *(a)*	79.9	20.1	27.1	50.2	2.6	52.9
11	Kerala	68.9	31.1	12.6	48.7	7.6	56.3
12	Madhya Pradesh *(d)*	60.5	39.5	22.2	34.5	3.8	38.2

13	Maharashtra *(e)*	71.6	28.4	33.6	33.6	4.5	38.0
14	Manipur	55.7	44.3	18.0	37.7	0.0	37.7
15	Meghalaya	86.7	13.3	0.0	3.3	83.3	86.7
16	Mizoram	N.M	N.M	N.M	N.M	N.M	N.M
17	Nagaland	N.M	N.M	N.M	N.M	N.M	N.M
18	Orissa *(a)*	50.9	49.1	22.7	23.6	4.5	28.1
19	Punjab *(f)*	57.9	42.1	4.5	50.9	2.4	53.4
20	Rajasthan *(d)*	57.5	42.5	13.1	36.0	8.4	44.4
21	Sikkim	N.M	N.M	N.M	N.M	N.M	N.M
22	Tamilnadu	90.9	9.1	11.0	68.5	11.4	79.9
23	Tripura *(e)*	80.9	19.1	38.7	42.3	0.0	42.3
24	Uttar Pradesh *(a)*	80.4	19.6	36.9	43.5	0.0	43.5
25	West Bengal *(g)*	63.4	36.6	0.0	63.4	0.0	63.4
26	A & N Islands	N.M	N.M	N.M	N.M	N.M	N.M
27	Chandigarh *(h)*	100.0	0.0	0.0	100.0	0.0	100.0
28	D & N Haveli	N.M	N.M	N.M	N.M	N.M	N.M
29	Daman & Diu	N.M	N.M	N.M	N.M	N.M	N.M
30	Delhi *(a)*	89.7	10.3	20.3	69.5	0.0	69.5
31	Lakshadweep	N.M	N.M	N.M	N.M	N.M	N.M
32	Pondicherry	92.4	7.6	7.2	82.6	2.6	85.2
	All India	74.2	25.8	21.7	48.7	3.8	52.5

Note : Footnotes under Table 2.1 may please be seen

N.M : No Municipal Roads

The distribution of states and UTs by percentage share of surfaced municipal roads is given in Table 2.6. The statistics depicted in Table 2.6 indicate that only in 8 states / UT's, that is in only about 33% of the 24 states / UT's, more than 80% of the municipal roads was surfaced. These states / UT's are Jammu & Kashmir, Chandigarh, Pondicherry, Tamilnadu, Delhi, Meghalaya, Tripura and Uttar Pradesh. In Bihar and Assam, surfaced roads account for not even 50%. The picture is also dismal in Manipur, Orissa, Punjab and Rajasthan, as the ratio is not even 60% in any of these states.

Table 2.6
Distribution of States and U.T.'s by
Percentage of Surfaced Municipal Roads
As on 31st March,1999

Percentage Range	No. States and U.T.'s	Percentage
0 - 50	2	8.3
50 - 60	4	16.7
60 - 70	3	12.5
70 - 80	7	29.2
80 - 90	4	16.7
90 & above	4	16.7
Total	24	100.0

Note : Footnotes under Table 2.1 may please be seen

Surfaced roads are generally classified into three types based on the basis of type of surface, viz., Water Bound Macadam (W.B.M), Black Top (B.T) and Cement Concrete (C.C). Figures furnished in Table 2.5 show that, in the country as a whole, B.T + C.C roads accounted for only about 52%. This clearly indicates the poor condition of municipal roads in our country. Cement Concrete roads formed about only 4%, as the cost of construction of C.C roads is comparatively very high. Surprisingly, C.C roads account for more than 80% in Meghalaya. This is perhaps because the municipalities in this state prefer to construct C.C roads in view of the heavy rainfall in the region. The proportion of C.C. roads is less than 10% in all other states / UT's except Andhra Pradesh (12.9%) and Himachal Pradesh (24.3%).

The distribution of states and UTs by percentage of BT + CC municipal roads is presented in Table 2.7. Among the 24 states / UTs, where municipal roads existed, the proportion of BT + CC roads was found to be more than 70% in 5 states viz. Chandigarh (100%), Jammu and Kashmir (99.5%), Meghalaya (86.7%), Pondicherry (85.2%) and Tamil Nadu (79.9%). The proportion of BT + CC roads formed not even 50% in 10 states / UTs (40%) namely, Andhra Pradesh, Assam, Bihar, Madhya Pradesh, Maharashtra, Manipur, Orissa, Rajasthan, Tripura and Uttar Pradesh. The states which had a figure higher than the national average of 52.5% were 14 in number.

Table 2.7
Distribution of States and U.T.'s by Percentage of B.T *plus* C.C. Municipal Roads As on 31st March,1999

Percentage Range	No. States and U.T.'s	Percentage
Below 30	2	8.3
30 - 40	4	16.7
40 - 50	4	16.7
50 - 60	3	12.5
60 - 70	6	25.0
70 & above	5	20.8
Total	24	100.0

Note : Footnotes under Table 2.1 may please be seen

The Water Bound Macadam municipal roads accounted for about 22% of the total length of municipal roads in the country. Looking at the state / UT wise picture in Table 2.5, it is revealed that the proportion of W.B.M. roads was more than the national average of 21.7% in Andhra Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Tripura and Uttar Pradesh. The proportion was observed to be more than 30% in three states viz., Maharashtra, Tripura and Uttar Pradesh.

CHAPTER III

Surface Quality of Municipal Roads in Class I Cities

In the last chapter, data on municipal roads were presented at all-India and state levels and were analysed. The aggregated pictures at all-India and state levels do not indicate the inter-town variations. As far as municipal roads at town level are concerned, the required data was received from only 96 Class I cities. Hence, in this chapter, data pertaining to only 96 Class I cities have been analysed.

Length of Municipal Roads

The town wise data on the length of municipal roads by type of surface, as on 1.4.2001, for 96 cities can be seen in Table-3.1. The data furnished in Table 3.1 shows that there are wide variations among towns with regard to availability of municipal roads. The total length of municipal roads varies from 9.8 kms. in Patan to 5308 Kms. in Lucknow. Among the 96 towns, the total length of municipal road was highest in Lucknow (5308 kms.) and was followed by Chennai (2812 kms). The lowest length was in Patan (9.8 kms) and Dimapur, with a length of 13.5 kms., stood ahead of Patan.

Table 3.1
Length of Municipal Roads by Type of Surface (in kms.)
As on 1.4.2001

Sl. No.	City	Kuch-cha	W.B.M	B.T	C.C	Others	Total
1	Nagaon	16.2	7.0	34.5	0.0	13.5	71.2
2	Silchar	42.0	24.0	2.0	0.0	0.0	68.0
3	Anand	2.3	52.9	81.7	3.1	0.0	140.0
4	Jetpur-Navagadh	82.2	36.5	28.5	10.9	0.0	158.2
5	Bhavnagar	4.5	12.6	186.0	10.4	19.7	233.1
6	Nadiad	125.6	72.4	106.1	0.4	0.0	304.4
7	Navsari	0.0	18.3	108.0	0.4	2.0	128.7
8	Palanpur	28.2	6.7	24.9	4.2	0.0	63.9
9	Patan	6.8	3.0	0.0	0.0	0.0	9.8

10	Surat	62.3	24.7	832.8	0.6	0.0	920.4
11	Veraval	73.9	9.9	29.6	20.2	0.0	133.6
12	Bhiwani	51.4	4.2	51.8	55.6	0.0	163.0
13	Hisar	96.7	75.5	52.7	11.9	0.0	236.7
14	Shimla	40.6	0.0	121.9	0.0	0.0	162.5
15	Belgaum	30.0	78.0	492.0	15.0	0.0	615.0
16	Bellary	71.0	152.0	233.0	11.0	0.0	467.0
17	Bhadravati	11.3	35.6	33.5	0.2	0.0	80.5
18	Bidar	159.6	95.5	40.9	5.6	0.0	301.6
19	Bijapur	55.0	23.9	320.0	3.0	10.1	412.0
20	Byatarayanapura	31.5	42.0	193.0	37.0	17.0	320.5
21	Chikmagalur	24.0	18.0	26.0	2.5	0.0	70.5
22	Chitradurga	41.0	15.0	32.0	1.8	14.2	104.0
23	Dasarahalli	230.0	49.0	90.0	20.0	0.0	389.0
24	Davanagere	185.0	122.0	168.0	13.0	0.0	488.0
25	Gadag-Betigeri	19.0	39.7	43.2	6.0	0.0	107.9
26	Gulbarga	290.0	95.0	172.0	13.0	0.0	570.0
27	Hassan	17.5	39.3	40.8	0.5	38.1	136.1
28	Hospet	28.0	32.0	11.2	5.4	0.0	76.6
29	Hubli-Dharwad	45.0	92.0	428.0	0.0	2.0	567.0
30	Kolar	20.0	71.0	60.0	5.0	0.0	156.0
31	Krishnarajapura	78.0	142.0	137.0	2.0	3.0	362.0
32	Mandya	49.4	25.1	73.3	4.1	0.0	151.9
33	Mangalore	32.0	60.0	414.0	5.0	0.0	511.0
34	Mysore	92.5	80.0	978.5	11.0	0.0	1162.0
35	Raichur	500.0	48.0	110.0	10.0	25.0	693.0
36	Robertson Pet	30.0	50.0	12.0	11.0	14.0	117.0
37	Shimoga	40.0	90.0	280.0	10.0	50.0	470.0
38	Tumkur	70.0	110.0	125.0	0.0	0.0	305.0
39	Udupi	2.3	16.3	574.2	8.3	0.0	601.0
40	Achalpur	13.4	32.4	66.8	21.4	1.8	135.8
41	Ambarnath	55.0	28.8	88.4	19.2	0.0	191.4
42	Bhiwandi	0.0	1.1	161.2	184.1	0.4	346.8
43	Chandrapur	141.7	109.1	129.5	11.7	0.0	392.0
44	Ichalkaranji	38.9	7.1	305.2	2.0	0.0	353.1
45	Latur	0.0	520.0	550.2	164.8	140.8	1375.8

46	Mira-Bhayandar	1.5	1.2	154.4	148.5	0.0	305.6
47	Navghar-Manikpur	0.0	0.1	43.6	20.5	0.0	64.2
48	Panvel	0.0	12.6	34.5	0.6	0.0	47.7
49	Sangli-Miraj & Kupwad	53.4	69.4	190.4	0.0	0.0	313.1
50	Thane	90.0	42.0	136.0	12.0	0.0	280.0
51	Ulhasnagar	0.0	7.8	86.2	29.0	2.1	125.1
52	Virar	0.0	2.0	43.0	2.0	0.0	47.0
53	Dimapur	8.0	4.0	1.5	0.0	0.0	13.5
54	Baleshwar	0.0	108.8	190.4	28.3	22.9	350.4
55	Bhubaneswar	67.7	181.2	548.9	50.4	51.9	900.0
56	Brahmapur	28.8	44.5	150.3	23.0	0.0	246.6
57	Cuttack	64.8	117.2	485.1	116.0	0.0	783.0
58	Puri	52.5	91.8	106.0	27.0	40.0	317.4
59	Raurkela	140.5	59.1	221.0	136.2	27.0	583.9
60	Sambalpur	194.2	82.8	124.5	37.9	63.8	503.1
61	Pondicherry	4.2	8.1	218.9	3.5	3.5	238.2
62	Bathinda	11.3	7.5	188.5	6.4	42.0	255.7
63	Jalandhar	54.0	0.0	801.0	306.0	250.0	1411.0
64	Malerkotla	0.0	5.0	44.0	13.2	1.5	63.7
65	S.A.S. Nagar (Mohali)	0.0	0.0	477.0	3.0	0.0	480.0
66	Sikar	182.0	7.9	27.9	14.0	0.0	231.7
67	Tonk	70.0	15.0	50.0	20.0	5.0	160.0
68	Avadi	118.7	46.2	145.9	21.3	0.0	332.1
69	Chennai	0.0	0.0	2777.0	35.0	0.0	2812.0
70	Erode	0.0	0.0	96.7	5.3	0.0	102.1
71	Kancheepuram	2.6	8.5	47.8	19.5	0.0	78.4
72	Pudukkottai	0.0	4.0	143.5	9.0	1.5	158.0
73	Thanjavur	0.0	50.0	128.5	64.8	0.0	243.3
74	Thoothukkudi	8.7	23.7	90.3	20.0	0.0	142.7
75	Tiruvannamalai	6.1	7.2	51.6	8.0	0.0	73.0
76	Vellore	0.0	2.0	46.8	50.3	5.3	104.4
77	Deoria	9.7	38.6	35.0	2.3	0.0	85.6
78	Loni	50.0	25.0	0.0	0.0	12.5	87.5
79	Lucknow	365.0	0.0	4015.0	123.0	805.0	5308.0
80	Mathura	56.0	0.0	33.5	1.5	55.0	146.0

81	Rae Bareli	42.2	99.3	133.1	0.3	0.0	274.8
82	Dehradun	58.4	0.0	344.0	3.6	44.2	450.2
83	Hardwar	7.8	0.0	48.1	58.8	30.6	145.3
84	Ashoknagar Kalyangarh	55.9	41.9	137.5	14.5	27.7	277.5
85	Bally	7.3	6.9	90.8	0.0	65.6	170.5
86	Barddhaman	0.0	55.0	146.0	6.7	0.0	207.7
87	Barrackpur	378.0	39.6	125.2	9.6	180.5	732.9
88	Durgapur	101.5	16.6	371.0	0.0	14.0	503.1
89	Haldia	50.0	105.0	35.0	2.0	438.0	630.0
90	Halisahar	35.5	25.9	38.7	27.4	24.2	151.6
91	Hugli-Chinsurah	12.0	6.0	160.0	3.0	95.0	276.0
92	Kanchrapara	15.0	2.0	62.0	1.0	33.0	113.0
93	Madhyamgram	77.3	57.2	102.9	3.6	37.8	278.9
94	Maheshtala	7.5	17.7	116.9	55.5	49.9	247.5
95	Panihati	112.0	0.0	120.2	30.0	88.0	350.2
96	Serampore	39.1	51.2	89.0	2.8	0.0	182.1

Source : Data received from the local bodies

Abbreviations :

W.B.M : Water Bound Macadum

B.T : Black Top

C.C : Cement Concrete

The total length of municipal roads was more than 1000 kms. in Lucknow(5308), Chennai(2812), Jalandhar(1411), Latur(1375.8) and Mysore(1162) and less than 100 kms. in 16 towns, viz., Loni(87.5), Deoria(85.6) Bhadravati(80.5), Kancheepuram(78.4), Hospet(76.6), Thiruvannamalai(73.0), Nagaon(71.2), Chikmagalur(70.5), Silchar(68), Navgarh-Manikpur(64.2), Palanpur(63.9), Malerkotla(63.7), Panvel(47.7), Virar(47), Dimapur(13.5) and Patan(9.8). There were wide variations among the 96 towns which can be attributed to area, population and topography of the town. It may also be noted here that in case of some towns, all or some of the internal roads within the town may be under the jurisdiction of an agency other than the municipality and, therefore, the length of municipal roads in such towns may be nil or much less.

Municipal Roads in relation to Population

The absolute figures given in Table 3.1 do not indicate the adequacy of municipal roads in a town. A town may have a much higher total length of roads than the length in another town, but that does not mean that the former is better placed than the latter, as much of the population in the former may not be served by municipal roads. In order to know the adequacy of municipal roads in different towns, the length of roads has to be analysed after relating it to area and population.

It is seen from Table 3.2 that there are wide variations with regard to length of municipal roads in relation to population. The length of municipal roads per lakh of population was more than 500 kms. in Udupi (531.6 - highest) and Barrackpur (507.8) whereas it was only 8.8 kms (lowest) in Patan and 12.6 Kms in Dimapur.

Table 3.2
Length of Municipal Roads in relation to Population and Area
As on 1.4.2001

Sl. No.	City	Length of Roads Per Lakh of Population * (Km.)	Length of Roads Per Sq. Km. of Area ** (Km.)
1	Nagaon	66.3	7.7
2	Silchar	47.8	4.3
3	Anand	107.3	6.6
4	Jetpur-Navagadh	151.6	4.4
5	Bhavnagar	45.6	4.3
6	Nadiad	157.9	10.5
7	Navsari	96.1	15.1
8	Palanpur	57.9	3.2
9	Patan	8.8	0.7
10	Surat	37.8	8.2
11	Veraval	94.6	13.8
12	Bhiwani	96.2	5.6
13	Hisar	92.2	5.2
14	Shimla	114.3	5.7
15	Belgaum	153.9	6.5

16	Bellary	147.3	5.7
17	Bhadravati	50.2	1.2
18	Bidar	175.1	7.0
19	Bijapur	167.5	3.1
20	Byatarayanapura	177.1	12.8
21	Chikmagalur	69.8	2.6
22	Chitradurga	84.8	4.7
23	Dasarahalli	147.6	15.6
24	Davanagere	134.1	8.0
25	Gadag-Betigeri	69.7	2.1
26	Gulbarga	133.2	10.3
27	Hassan	116.0	10.8
28	Hospet	46.9	1.5
29	Hubli-Dharwad	72.1	2.8
30	Kolar	137.7	13.0
31	Krishnarajapura	193.1	8.2
32	Mandya	115.8	8.9
33	Mangalore	128.2	4.3
34	Mysore	156.5	9.0
35	Raichur	337.0	8.8
36	Robertson Pet	82.8	2.0
37	Shimoga	171.5	9.4
38	Tumkur	122.7	5.2
39	Udupi	531.6	8.8
40	Achalpur	126.5	8.2
41	Ambarnath	93.9	5.0
42	Bhiwandi	57.9	13.1
43	Chandrapur	131.7	7.0
44	Ichalkaranji	137.1	11.8
45	Latur	458.9	43.0
46	Mira-Bhayandar	58.7	3.8
47	Navghar-Manikpur	55.0	4.0
48	Panvel	45.8	3.9
49	Sangli-Miraj & Kupwad	71.7	2.6
50	Thane	22.2	1.9
51	Ulhasnagar	26.5	9.6

52	Virar	39.5	2.4
53	Dimapur	12.6	3.4
54	Baleshwar	330.5	18.0
55	Bhubaneswar	139.0	6.7
56	Brahmapur	85.1	7.4
57	Cuttack	146.3	5.8
58	Puri	201.4	18.9
59	Raurkela	260.0	4.2
60	Sambalpur	326.3	14.9
61	Pondicherry	107.9	12.2
62	Bathinda	117.6	2.3
63	Jalandhar	201.2	13.1
64	Malerkotla	59.7	2.5
65	S.A.S. Nagar (Mohali)	389.3	20.6
66	Sikar	125.3	5.9
67	Tonk	118.0	3.2
68	Avadi	143.8	5.1
69	Chennai	66.7	16.2
70	Erode	67.5	12.1
71	Kancheepuram	51.3	6.8
72	Pudukkottai	145.0	12.2
73	Thanjavur	112.8	6.7
74	Thoothukkudi	66.1	10.6
75	Tiruvannamalai	56.0	5.4
76	Vellore	58.8	9.0
77	Deoria	82.2	5.3
78	Loni	72.5	13.5
79	Lucknow	240.5	17.1
80	Mathura	48.9	5.8
81	Rae Bareli	162.3	8.4
82	Dehradun	100.5	6.6
83	Hardwar	83.0	11.4
84	Ashoknagar Kalyangarh	248.9	16.8
85	Bally	65.2	14.4
86	Barddhaman	72.6	15.7
87	Barrackpur	507.8	62.9

88	Durgapur	102.0	3.3
89	Haldia	369.1	5.8
90	Halisahar	121.8	18.3
91	Hugli-Chinsurah	162.2	16.0
92	Kanchrapara	89.6	12.5
93	Madhyamgram	179.3	13.0
94	Maheshtala	63.6	5.8
95	Panihati	100.5	18.1
96	Serampore	92.0	10.7

** Based on Provisional Population of Census 2001*

*** Based on Area as on 1.4.2001 (as per the data obtained)*

Note : Area and Population of towns can be seen in Appendix II

The distribution of towns by length of municipal roads per lakh of population as on Ist April, 2001, is given in Table 3.3. It is seen from Table 3.3 that in 11 towns (Patan, Dimapur, Thane, Ulhasnagar, Surat, Virar, Bhavnagar, Panvel, Hospet, Silchar & Mathura) or about 11.5% of the 96 towns, the length of municipal roads per lakh of population was less than 50 kms.

Table 3.3
Distribution of Towns by Length of Municipal Roads Per lakh of Population - As on 1.4.2001

Range of Length in Kms.	No. of Towns	Percentage
Less than 50	11	11.5
50 - 100	33	34.4
100 - 200	39	40.6
200 - 300	5	5.2
300 - 400	5	5.2
400 - 500	1	1.0
500 & above	2	2.1
Total	96	100.0

In 83 towns or about 86% of the 96 towns, the length of municipal roads per lakh of population was less than 200 kms, and in 10 towns (10%), it was between 200 kms to 400 kms. In one town, viz. Latur, the length of municipal roads per lakh

of population was 458.9 kms. i.e. between 400 kms to 500 kms. whereas in 2 towns, viz. Udupi (531.6 kms) and Barrackpur (507.8 kms), it was more than 500 kms.

It can be concluded from the data furnished in Table 3.3 that the length of municipal roads in relation to population was inadequate in most of the selected towns. The condition was worst in 11 towns where the length of municipal roads was not even 50 kms per lakh of population.

Municipal Roads in relation to Area

It is seen from Table 3.2 that there are wide variations among towns with regard to availability of municipal roads in relation to area. In Patan (0.7 km), Bhadravati (1.2 km), Hospet (1.5 km) and Thane (1.9 kms), the length of roads per sq. km of area was less than 2 kms.; whereas in Barrackpur, Latur and S.A.S Nagar (Mohali), the length of roads in relation to per sq. km of area was 62.9 kms, 43 kms and 20.6 kms respectively. The distribution of towns by length of municipal roads per sq. km. of area is given in Table 3.4.

Table 3.4
Distribution of Towns by Length of Municipal Roads Per Sq.Km. of Area - As on 1.4.2001

Range of Length in Kms.	No. of Towns	Percentage
Less than 5	26	27.1
5 - 10	36	37.5
10 - 15	20	20.8
15 - 20	11	11.5
20 - 25	1	1.0
25 & above	2	2.1
Total	96	100.0

It is seen from Table 3.4 that in 26 towns or about 27% of the 96 towns, the availability of municipal roads per sq. km of area was less than 5 kms and in 36 towns (38%), it was between 5 kms to 10 kms. It can thus be concluded that 62 towns (65%) had less than 10 kms. of municipal roads per sq. km. of area. On the other hand, 31 towns (32%) had between 10 kms to 20 kms, and 3 towns (3%) viz. Barrackpur, Latur and S.A.S Nagar, had more than 20 kms. length of municipal

roads per sq. km. of area. It is thus observed that the position with regard to availability of municipality roads in relation to area was very low in Patan, Bhadravati, Hospet and Thane.

Surface Quality of Municipal Roads

It has been mentioned in the last chapter that in the country as a whole only about 74% of the municipal roads is surfaced. The proportion of surfaced municipal roads is not only low in the country as a whole, but there are also wide variations among the urban areas. This becomes clearly evident when one looks at the statistics presented in Table 3.5. As may be seen from this table, unsurfaced roads formed as high as 78.5 in Sikar, which means that only about 21.5% of the municipal roads was surfaced in this town. Sikar is followed by Raichur (72.2%) and Patan (69.2%). In Udupi and Mira Bhayandar, the proportion of unsurfaced roads was the lowest i.e. 0.4% and 0.5 % respectively.

Table 3.5
Percentage Share of Each Category of Municipal Roads to Total Length
As on 1.4.2001

Sl. No.	Town	Kuchcha	W.B.M	B.T	C.C	Others	B.T. + C.C
1	Nagaon	22.8	9.8	48.5	0.0	19.0	48.5
2	Silchar	61.8	35.3	2.9	0.0	0.0	2.9
3	Anand	1.7	37.8	58.3	2.2	0.0	60.5
4	Jetpur-Navagadh	52.0	23.1	18.0	6.9	0.0	24.9
5	Bhavnagar	1.9	5.4	79.8	4.4	8.4	84.2
6	Nadiad	41.2	23.8	34.8	0.1	0.0	35.0
7	Navsari	0.0	14.2	83.9	0.3	1.6	84.2
8	Palanpur	44.1	10.5	38.9	6.6	0.0	45.5
9	Patan	69.2	30.8	0.0	0.0	0.0	0.0
10	Surat	6.8	2.7	90.5	0.1	0.0	90.5
11	Veraval	55.3	7.4	22.1	15.1	0.0	37.3
12	Bhiwani	31.5	2.6	31.8	34.1	0.0	65.9
13	Hisar	40.9	31.9	22.2	5.0	0.0	27.3
14	Shimla	25.0	0.0	75.0	0.0	0.0	75.0

15	Belgaum	4.9	12.7	80.0	2.4	0.0	82.4
16	Bellary	15.2	32.5	49.9	2.4	0.0	52.2
17	Bhadravati	14.0	44.2	41.6	0.2	0.0	41.8
18	Bidar	52.9	31.7	13.6	1.9	0.0	15.4
19	Bijapur	13.4	5.8	77.7	0.7	2.5	78.4
20	Byatarayanapura	9.8	13.1	60.2	11.5	5.3	71.8
21	Chikmagalur	34.0	25.5	36.9	3.5	0.0	40.4
22	Chitradurga	39.4	14.4	30.8	1.7	13.7	32.5
23	Dasarahalli	59.1	12.6	23.1	5.1	0.0	28.3
24	Davanagere	37.9	25.0	34.4	2.7	0.0	37.1
25	Gadag-Betigeri	17.6	36.8	40.0	5.6	0.0	45.6
26	Gulbarga	50.9	16.7	30.2	2.3	0.0	32.5
27	Hassan	12.9	28.8	30.0	0.3	28.0	30.3
28	Hospet	36.6	41.8	14.6	7.0	0.0	21.7
29	Hubli-Dharwad	7.9	16.2	75.5	0.0	0.4	75.5
30	Kolar	12.8	45.5	38.5	3.2	0.0	41.7
31	Krishnarajapura	21.5	39.2	37.8	0.6	0.8	38.4
32	Mandya	32.5	16.5	48.2	2.7	0.0	50.9
33	Mangalore	6.3	11.7	81.0	1.0	0.0	82.0
34	Mysore	8.0	6.9	84.2	0.9	0.0	85.2
35	Raichur	72.2	6.9	15.9	1.4	3.6	17.3
36	Robertson Pet	25.6	42.7	10.3	9.4	12.0	19.7
37	Shimoga	8.5	19.1	59.6	2.1	10.6	61.7
38	Tumkur	23.0	36.1	41.0	0.0	0.0	41.0
39	Udupi	0.4	2.7	95.5	1.4	0.0	96.9
40	Achalpur	9.9	23.9	49.2	15.8	1.3	64.9
41	Ambarnath	28.7	15.0	46.2	10.1	0.0	56.2
42	Bhiwandi	0.0	0.3	46.5	53.1	0.1	99.6
43	Chandrapur	36.1	27.8	33.0	3.0	0.0	36.0
44	Ichalkaranji	11.0	2.0	86.4	0.6	0.0	87.0
45	Latur	0.0	37.8	40.0	12.0	10.2	52.0
46	Mira-Bhayandar	0.5	0.4	50.5	48.6	0.0	99.1
47	Navghar-Manikpur	0.0	0.1	67.9	32.0	0.0	99.9
48	Panvel	0.0	26.4	72.3	1.3	0.0	73.6
49	Sangli-Miraj & Kupwad	17.0	22.2	60.8	0.0	0.0	60.8
50	Thane	32.1	15.0	48.6	4.3	0.0	52.9

51	Ulhasnagar	0.0	6.2	68.9	23.2	1.7	92.1
52	Virar	0.0	4.3	91.5	4.3	0.0	95.7
53	Dimapur	59.3	29.6	11.1	0.0	0.0	11.1
54	Baleshwar	0.0	31.1	54.3	8.1	6.5	62.4
55	Bhubaneswar	7.5	20.1	61.0	5.6	5.8	66.6
56	Brahmapur	11.7	18.0	61.0	9.3	0.0	70.3
57	Cuttack	8.3	15.0	61.9	14.8	0.0	76.8
58	Puri	16.5	28.9	33.4	8.5	12.6	41.9
59	Raurkela	24.1	10.1	37.9	23.3	4.6	61.2
60	Sambalpur	38.6	16.5	24.7	7.5	12.7	32.3
61	Pondicherry	1.8	3.4	91.9	1.4	1.5	93.3
62	Bathinda	4.4	2.9	73.7	2.5	16.4	76.2
63	Jalandhar	3.8	0.0	56.8	21.7	17.7	78.5
64	Malerkotla	0.0	7.8	69.1	20.7	2.4	89.8
65	S.A.S. Nagar (Mohali)	0.0	0.0	99.4	0.6	0.0	100.0
66	Sikar	78.5	3.4	12.0	6.0	0.0	18.1
67	Tonk	43.8	9.4	31.3	12.5	3.1	43.8
68	Avadi	35.7	13.9	43.9	6.4	0.0	50.3
69	Chennai	0.0	0.0	98.8	1.2	0.0	100.0
70	Erode	0.0	0.0	94.8	5.2	0.0	100.0
71	Kancheepuram	3.3	10.8	61.0	24.9	0.0	85.9
72	Pudukkottai	0.0	2.5	90.8	5.7	0.9	96.5
73	Thanjavur	0.0	20.5	52.8	26.6	0.0	79.5
74	Thoothukkudi	6.1	16.6	63.3	14.0	0.0	77.3
75	Tiruvannamalai	8.4	9.9	70.7	11.0	0.0	81.7
76	Vellore	0.0	1.9	44.9	48.1	5.1	93.0
77	Deoria	11.3	45.1	40.9	2.7	0.0	43.6
78	Loni	57.1	28.6	0.0	0.0	14.3	0.0
79	Lucknow	6.9	0.0	75.6	2.3	15.2	78.0
80	Mathura	38.4	0.0	22.9	1.0	37.7	24.0
81	Rae Bareli	15.4	36.1	48.4	0.1	0.0	48.5
82	Dehradun	13.0	0.0	76.4	0.8	9.8	77.2
83	Hardwar	5.4	0.0	33.1	40.5	21.1	73.6
84	Ashokngr. Kalyangarh	20.1	15.1	49.6	5.2	10.0	54.8
85	Bally	4.3	4.0	53.3	0.0	38.5	53.3
86	Barddhaman	0.0	26.5	70.3	3.2	0.0	73.5

87	Barrackpur	51.6	5.4	17.1	1.3	24.6	18.4
88	Durgapur	20.2	3.3	73.7	0.0	2.8	73.7
89	Haldia	7.9	16.7	5.6	0.3	69.5	5.9
90	Halisahar	23.4	17.1	25.5	18.0	16.0	43.5
91	Hugli-Chinsurah	4.3	2.2	58.0	1.1	34.4	59.1
92	Kanchrapara	13.3	1.8	54.9	0.9	29.2	55.8
93	Madhyamgram	27.7	20.5	36.9	1.3	13.6	38.2
94	Maheshtala	3.0	7.2	47.2	22.4	20.2	69.7
95	Panihati	32.0	0.0	34.3	8.6	25.1	42.9
96	Serampore	21.5	28.1	48.9	1.5	0.0	50.4
Source : Compiled from the data received from the local bodies							

The distribution of towns by percentage of unsurfaced roads as on Ist April, 2001, is presented in Table 3.6. It is seen from this table that the proportion of unsurfaced roads was less than 10 % in about 44% of the 96 towns. In more than one-third of the 96 towns, the proportion was more than 20%. In fact, in about 40% of the 96 towns, the proportion of surfaced roads was either 80% or lower. It has to be noted here that surfaced roads include W.B.M. roads. The scenario pertaining to municipal roads turns out to be more dismal, if only B.T. and C.C. roads are considered as surfaced roads. This is evident from the analysis made in the following paragraphs.

Table 3.6
Distribution of Towns by Percentage of Kuchcha Roads - As on 1.4.2001

Percentage Range	No. of Towns	Percentage
Less than 10	42	43.8
10 - 20	14	14.6
20 - 30	12	12.5
30 - 40	12	12.5
40 - 50	4	4.2
50 - 60	8	8.3
60 & above	4	4.2
Total	96	100.0

Black Top and Cement Concrete Roads

It is seen from Table 3.5 that in 3 towns, viz. S.A.S. Nagar (Mohali), Chennai and Erode, all the municipal roads were either Black Top or Cement Concrete. In Loni and Patan, however, Black Top and Cement Concrete roads did not exist. In two towns, viz., Silchar and Haldia, the share of B.T *plus* C.C. roads to total length of municipal roads was only 2.9% and 5.9 % respectively. The distribution of towns by percentage of Black Top + Cement Concrete roads is presented in Table 3.7.

Table 3.7
Distribution of Towns by Percentage of B.T. +C.C. Roads - As on 1.4.2001

Percentage Range	No. of Towns	Percentage
Less than 10	4	4.2
10 - 20	6	6.3
20 - 30	5	5.2
30 - 40	10	10.4
40 - 50	13	13.5
50 - 60	11	11.5
60 - 70	9	9.4
70 - 80	16	16.7
80 - 90	9	9.4
90 - 100	13	13.5
Total	96	100.0

The proportion of Black Top *plus* Cement Concrete roads was less than 10% in 4 towns (Loni, Patan, Silchar & Haldia) or about 4 % of the 96 towns, whereas the corresponding figure was between 90% to 100% in 13 towns (13.5%). It is observed from the available data that out of 96 sample towns, only in 58 towns (about 61%), the proportion of Black Top + Cement Concrete roads to the total length of municipal roads was more than 50%.

From the foregoing analysis, it can be safely concluded that there are still many towns and cities in the country, where the quality of municipality roads is very poor. The reason is, of course, lack of resources with the municipalities, but the situation needs to be remedied to meet the demand of the increasing traffic.

Roads

Recommendations

1. Improving the Financial Health of Local Bodies

Almost all the municipal bodies face paucity of funds and, therefore, shortage of funds is a major bottleneck for construction of new roads and maintenance and upkeep of the existing roads. The first and the foremost requirement for improving the condition of municipal roads and maintaining them properly, is to improve the financial position of local bodies. Urban population and the number of urban centers are growing and therefore, the local bodies will require funds not only to improve the condition of existing roads but also to construct new roads. In order to improve the financial position, the municipal bodies need to be vested with powers to raise funds through municipal bonds and to set the levels of user charges for the services provided by them. The user charges have to be set at such levels that at lease the cost of providing services can be recovered through user charges. The other measures required to strengthen the financial health of the local bodies are assisting them through loans from financial institutions, to follow a rational taxation policy etc. Of course, there are many cities and towns which have a very weak economic-base and these towns may not be in a position to raise much resource through their own sources such as taxes, user charges, fees etc. The local bodies of such “weak” towns and cities will have to be supported by central and state governments to enable them to improve the quantity and quality of services being provided by them.

2. Privatization of Urban Services

Whatever measures may be taken to strengthen the financial position of local bodies, they may still face shortage of funds and may not be in a positon to provide satisfactory civic services. This is particularly true in case of roads, as construction of roads and its maintenance involve huge expenditure. The solution, therefore, lies in privatizing services wherever possible. The local

bodies should adhere to the slogan of “Privatize or Perish”. In this respect, it has to be noted that private sector may not be much interested in taking up municipal road development because it may not be economically viable. However, if the local bodies privatize other services, they may be in a position to save some funds to divert them for road construction.

3. Strengthening and proper Maintenance of Municipal Roads

Priority needs to be given to convert all roads into Black Top roads to ensure smooth and faster movement of all types of traffic. There is a need, not only to strengthen the existing roads, but also widen them wherever necessary and possible, as many of the internal roads in our cities are very small and this hampers smooth movement of traffic. The quality of a road to be constructed depends mainly on volume of traffic. In case of such roads where the traffic is very high, the quality of roads needs to be improved to increase the load-bearing capacity.

Due to shortage of funds, the local bodies do not give adequate attention and priority for maintenance of roads, and as a result, many of the roads in our cities and towns continue to remain in bad condition for many years. A new B.T. road, in general, requires resurfacing after a gap of every five years; but its regular maintenance is very much essential throughout the year, as, otherwise the road will get damaged within a period of two to three years. Hence, the municipalities need to give more attention for maintenance of roads.

4. Removal of Encroachments on Roads

There is hardly any city or town in our country where roads are not encroached upon. Encroachments on roads not only adversely affect smooth and faster movement of traffic but also have an economic impact. It has been estimated that Delhi loses about one crore rupees per kilometer per annum (Reference: The Time of India dated 28.4.2003) due to obstructions caused by encroachments on roads. Encroachments also cause noise and air pollution which in turn also causes financial losses. Encroachments make motorists and

other drivers use horns more number of times than they would have used otherwise. Thus, encroachments cost crores in terms of time loss, fuel wastage and environmental damage. The life of vehicles is also reduced. Encroachments also affect human behavior. A driver inconvenienced by encroachments has more chances of picking up a fight on road than any other driver. Further, he may also over-speed to make up for the time lost is traffic jams caused by encroachments. The discomfort caused to pedestrians and motorists by encroachments also results in quarrels and violation of traffic rules. Thus, encroachments can cause serious accidents. Encroachments also damage roads. The civic agencies should give top priority for removal of encroachments and state governments need to enact legislation to eliminate encroachments on roads and footpaths. The punishment under the legislation may be made so stringent that nobody would dare to encroach upon any public road.

5. Construction of New Footpaths and Removal of Encroachments on the Existing Footpaths

Footpaths on both sides of municipal roads exist only in a very few towns/cities. One can come across footpaths only in larger cities and that too only on the sides of some of the roads. Even in those cities, where footpaths are provided, they are invariably encroached upon. Wherever footpaths are encroached upon, the pedestrians are forced to walk on roads which again in turn hamper free flow of traffic. In many cities, one cannot come across even a kilometer-long stretch of pavement where one can walk undisturbed. The encroachments can be in any forman open manhole; unauthorized parking; encroached upon by hawkers, shopkeepers, police-beat boxes, electricity transformers etc. Pedestrians have the fundamental right to a safe walking space. Hence, here again, legislation has to be enacted by the state governments to eliminate encroachment of footpaths. Whenever any new road is constructed, in any town, it should be ensured that drains on both sides of the

road are constructed. This job should be included in the contract itself at the time of construction of a new road.

6. Proper Design of Footpaths

It is not just enough to lay footpaths, but they should also be of proper design, so that pedestrians do not hesitate to use them. If the height of footpaths goes beyond 6 inches, people do not prefer to walk on footpaths unless circumstance compel them to do so. Footpaths are not continuous and pedestrians proves inconvenient for them, they would prefer “Jay-walking” on the plain surface of a road.

7. Maintenance of Footpaths

Proper maintenance of footpaths is essential to enable people to use them. However, what is observed in our towns is that civic agenciew do not give adequate attention to keep the footpaths neat and clean. Sweepers do not clean the footpaths daily. On many footpaths one can come across heaps of silt removed from the nearby drains. Broken surfaces and damaged curbstones are common sights on footpaths.

8. Elimination of use of Concrete Piles over Drains as Footpaths

It has been observed that in many cities, separate footpaths are not laid, but the concrete piles provided over the drains running along the road on the sides of the road, are used as footpaths. This is not desirable, as the missing blocks force the pedestrians to walk on the road. Further, missing blocks or weak blocks can also result in pedestrians falling into the drains.

9. Providing Proper Drainage System along the Roads

Even if the quality of construction of a road is good, improper drainage can cause major damage to roads during rains due to accumulation of water on roads. When vehicles pass over stretches of roads with stagnant water, the bitumen surface begins to let in water and this makes the bitumen mixture less

adhesive resulting in the stones coming of the surface of the road and thereby creating potholes. The drainage system along the roads has to be perfect to prevent accumulation of water on roads.

10. Using Quality Materials for Construction of Roads and Footpaths

It is indispensable to use quality materials for construction of roads and footpaths so that they can have good resistance to wear and tear when it rains. What is observed in many of the towns today is that due to poor quality of construction, the surfaces of roads get peeled off and washed away even when the shower is not very heavy. Many times, poor construction of roads is due to non-inspection by the civic agencies at the time of construction of roads. Use of inferior materials reduces the life of a road. The life gets further reduced by exposure to rain or water logging.

11. Restoration of Roads/Footpaths after Digging

Roads/Footpaths are dug up by different agencies at different times for different types of work. Many a times, newly constructed roads are dug up within a period of a few days of their construction of either the telephone or electricity or water supply or some other department on the pretext of carrying out faults/repairs which are urgent in nature. When an agency digs up a road, the debris lie at the site for many months before the civic agency takes up the restoration work. The agency which is doing the digging work should also be made responsible for restoration of the road and that too immediately after the work is over.

12. Evolving Special Scheme to Improve condition of Municipal Roads

The Central Government may think of a separate scheme exclusively for the development of municipal roads. Under the scheme, financial assistance in the form of grants/loans can be given especially to the municipalities of those towns which have weak economic base. This may go a long way in improvement the condition of municipal roads in our country.

13. Street Lighting

All the municipal roads have to be well lit to ensure smooth movement of traffic during night hours as well as to avoid accidents. It is not enough if just streetlights are provided, they have to be maintained properly. The civic agencies should check street-lights on daily basis and fused – bulbs should be replaced immediately.

14. Planting of Trees

Trees not only cool the atmosphere but also go a long way in reducing pollution. Further, they also help in adding to the natural beauty of an area. Hence, trees need to be planted all along the roads on both sides, wherever possible, to improve the environment.