CHAPTER 2 VEHICLE REGISTRATION AND ACCIDENT STATISTICS

Delhi has developed as a seamless city with an urban continuum comprising of a number of rapidly growing towns in Haryana and UP. This has added to the volume and movement of traffic within Delhi.

Despite measures by way of increasing the length of the road network and road surface space through widening, construction of a number of flyovers/grade separators and, launching of the Metro, traffic congestion has continued to increase unabated.

Delhi Metro has a network of 211 Km. Another 300 Kms is under various stages of construction (Phase III) and planning (Phase IV). It carries about 26 lakh passengers per day. Buses in Delhi carry about 52 lakh passengers per day. In spite of this, Delhi faces huge congestion issues. This has its inevitable consequences in terms of accidents, pollution, commuting time and wasteful energy/fuel consumption. (Data Source: DMRC). **According to an estimate, altogether 48 different types of vehicles ply on Delhi roads.**

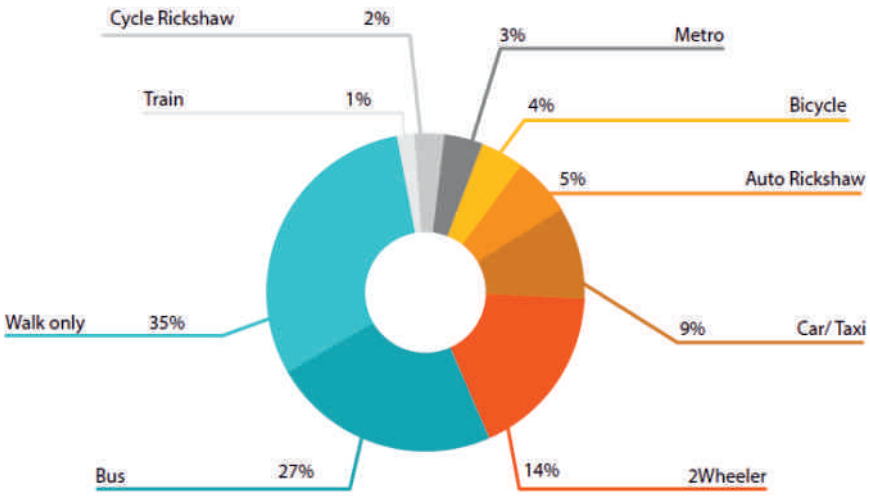


Chart - 2.1(a)

Total Trips : 219.87/lakh trips
Model Share of Delhi
Source : Dept of Transportation, GNCTD, 2007

- The lucrative and easy financial schemes, especially cheap auto-loan schemes of the government. have further boosted the trend of acquiring more and more individual cars and two wheelers.
- **The trend is further compounded by insufficient and inefficient public transport system which has, to an extent, forced the people to own their personal vehicles**. Though the Metro-

train lines have expanded and new low floor DTC buses have been put on road, much more is yet to be done to strengthen the public transport network and to integrate the components of the system. The economic boom and fast-life-style of metro citizens has also led them to own private vehicles to save time.

- **The alternate fuel options viz. CNG/ LPG which are cheaper** than petrol/diesel have further lured people to own private cars.
- **Delhi has lost the air quality** gains of its first generation action that included large scale conversion of public transport buses and three wheelers to natural gas; relocation of polluting industries; and

TABLE – 2.1

MOTOR VEHICLES REGISTERED IN DELHI

Cumulative

Year	Private Cars	M/Cycles Scooters	Taxis	TSRs	Goods Vehicles Delivery Vans and Others	Buses (Mini, Pvt. and others)	Total Motor Vehicles
1987	241,851	867,908	8,919	45,546	71,168	15,363	1,250,755
1988	279,708	978,698	9,094	51,700	80,412	16,319	1,415,931
1989	332,761	1,082,802	9,422	57,761	89,568	17,481	1,589,795
1990	383,610	1,191,186	10,026	62,007	99,078	18,651	1,764,558
1991	427,743	1,294,066	10,426	65,829	106,052	19,671	1,923,787
1992	468,809	1,381,582	11,212	69,974	110,465	22,640	2,064,682
1993	510,242	1,467,182	11,679	71,568	114,294	23,940	2,198,908
1994	557,543	1,580,817	12,225	74,408	122,444	25,553	2,372,990
1995	617,585	1,707,528	13,384	77,884	131,877	27,473	2,575,731
1996	685,850	1,844,471	14,593	80,208	139,300	29,183	2,793,605
1997	765,470	1,991,710	16,654	80,210	146,668	32,333	3,033,045
1998	804,814	2,076,548	16,927	85,518	148,670	34,567	3,167,044
1999	857,353	2,169,162	17,482	87,785	154,695	36,933	3,323,410
2000	920,723	2,230,534	18,362	86,985	158,492	41,483	3,456,579
2001	984,093	2,291,906	19,242	86,185	162,289	46,033	3,589,748
2002	1,147,762	2,461,261	16,770	123,495	138,351	38,132	3,925,771
2003	1,325,753	2,645,356	18,281	125,653	154,153	40,207	4,309,403
2004	1,415,729	2,811,951	22,239	129,862	160,852	41,866	4,582,499
2005	1,442,174	3,015,267	22,472	74,159	156,131	25,351	4,937,354
2006	1,568,990	3,277,905	25,956	74,189	148,326	43,345	5,138,711
2007	1,696,484	3,528,407	28,575	70,356	164,762	44,440	5,533,024
2008	1,828,522	3,735,076	29,833	77,741	188,199	44,644	5,904,015
2009	1,859,370	3,797,943	40,072	83,948	175,250	55,148	6,011,731
2010	2,013,680	4,055,229	45,240	86,482	193,205	58,047	6,451,883
2011	2,173,323	4,342,403	57,958	88,181	209,370	61,471	6,932,706
2012	2,343,113	4,644,146	69,780	88,197	228,886	64,033	7,438,155
2013	2,474,087	4,962,507	70,335	86,838	140,942	39,694	7,774,403
2014	2,629,343	5,297,697	78,686	91,840	154,654	40,947	8,293,167
2015	2,790,566	5,681,265	79,606	81,633	161,821	32,540	8,827,431
2016	2,986,579	6,104,070	91,073	198,137	281,159	43,723	9,704,741

Note: - Source Statistical Handbook of Delhi.

improvement in emissions standards for vehicles among others. **This is largely because of the explosive increase in vehicle numbers due to increased dependence on personal vehicles** in the absence of adequate, comfortable and efficient public transport services and walking and cycling facilities. Air pollution levels have worsened in recent times.

- Apart from the problems and requirements of transportation at the macro level, there are special problems in specific areas, particularly the old city, which deserve special attention.

The total number of registered motor vehicles figured 9,704,741 for the year 2016 i.e. about twice the number ten years back (Table 2.1).

Two wheelers constitute bulk of the vehicular traffic on Delhi roads and account for 62.89 % of the total vehicular population

- The private cars/jeeps, constitute 30.77 % share of total registered motorized vehicles. In other words, **private vehicles constitute around 94%** of total registered vehicles in Delhi. In contrast, Buses and TSRs constitute only 0.45% and 2.04 % of the total vehicles respectively (Chart- 2.1).

Chart 2.1

VEHICULAR POPULATION COMPOSITION

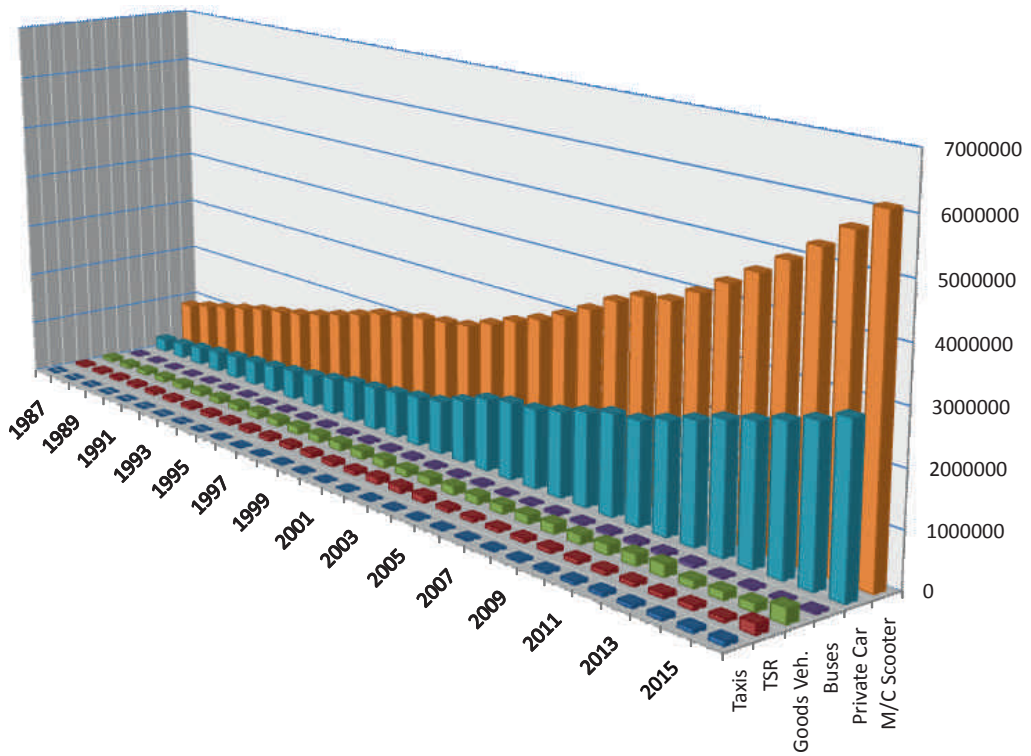


TABLE – 2.2

GROWTH / DECLINE IN MOTOR VEHICLE REGISTRATION OVER THE YEARS

Year	Private Cars	M/Cycles Scooters	Taxis	TSRs	Goods Vehicles	Buses	Total Regd. Vehicles	Yearly Growth (%)
1987	38,946	121,289	147	4833	9308	746	175,269	16.30
1988	37,857	110,790	175	6154	9244	956	165,176	13.20
1989	53,053	104,104	328	6061	9156	1162	173,864	12.28
1990	50,849	108,384	604	4246	9510	1170	174,763	11.00
1991	44,133	102,880	400	3822	6974	1020	159,229	9.02
1992	41,066	87,516	786	4145	4413	2969	140,895	7.32
1993	41,433	85,600	467	1594	3829	1300	134,226	6.50
1994	47,301	113,635	546	2840	8150	1613	174,082	7.91
1995	60,042	126,711	1159	3476	9433	1920	202,741	8.54
1996	68,265	136,943	1209	2324	7423	1710	217,874	8.46
1997	79,620	147,239	2061	2	7368	3150	239,440	8.57
1998	39,344	84,838	273	5308	2002	2234	133,999	4.42
1999	52,539	92,614	555	2267	6025	2366	156,366	4.70
2000	63,370	61,372	880	(-) 800	3797	4550	133,169	4.01
2001	63,370	61,372	880	(-) 800	3797	4550	133,169	3.85
2002	163,669	169,355	(-) 2472	37310	(-) 23938	(-) 7901	370,334	10.31
2003	177,991	184,095	1511	2158	15802	2075	383,632	9.77
2004	89,976	166,595	3958	4209	6699	1659	273,096	6.34
2005	26,445	203,316	233	(-) 55703	(-) 4721	(-) 16515	354,855	7.74
2006	126,816	262,638	3484	30	(-) 7805	17994	201,357	4.08
2007	127,494	250,502	2619	(-) 3833	16436	1095	394,313	7.67
2008	132,038	206,669	1258	7385	23437	204	370,991	6.71
2009	30,848	62,867	10239	6207	(-)12949	10504	107,716	1.82
2010	154,310	257,286	5168	2534	17955	2899	440,152	7.32
2011	159,643	287,174	12718	1699	16165	3424	480,823	7.45
2012	169,790	301,743	11822	16	19516	2562	505,449	7.29
2013	130,974	318,361	555	(-)1359	(-)87944	(-)24339	336,248	4.52
2014	155,256	335,190	8351	5002	13712	1253	518,764	6.67
2015	161,223	383,568	920	(-)10207	7167	(-)8407	534,264	6.44
2016	196,013	422,805	11467	116504	119338	11183	877,310	9.93

- **Vehicular population has recorded around 8 fold growth since 1987.** The growth rate was 6.44% in the year 2015 and it further increased to 9.9% per annum in the year 2016.
- The growth has been variable for different kinds of vehicles. **Increase has been much higher in the numbers of private cars and two wheelers than other types of vehicles. 877,310 vehicles were added during the year 2016**, showing a significant increase by about 343,046 over the previous year's registered figure of 534,264. **The actual growth of total newly added vehicles is mainly due to cars and two wheelers** (Table 2.2).
- The growth in the number of Buses is insignificant (Table 2.2). In fact, there is negative growth during the years 2002, 2005, 2013 and 2015. These years correspond to the implementation of major changes in policy like removal of blue line buses, introduction of low floor closed door buses or cluster buses.
- Aggregators like Ola and Uber operators have boosted the growth of taxi's and TSRs in the city.

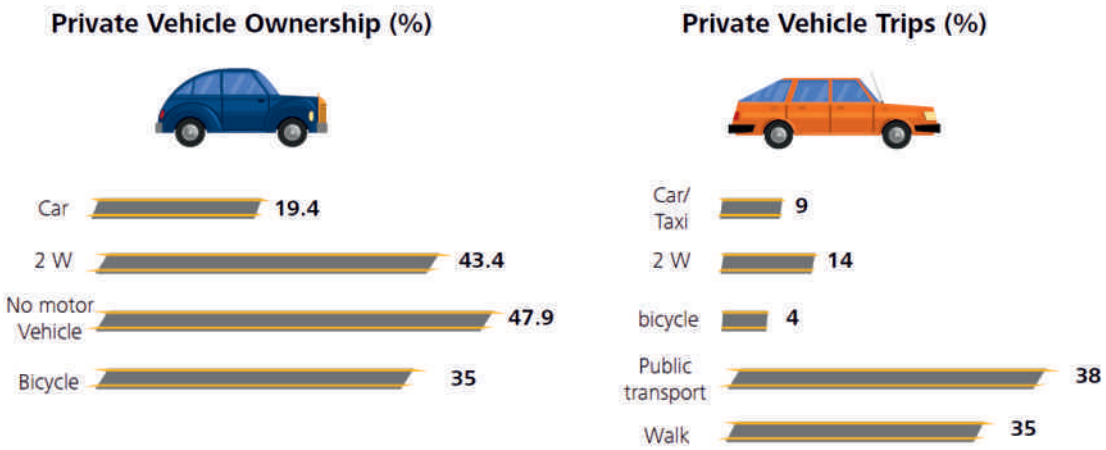
TABLE – 2.3
SLOW MOVING VEHICLES IN DELHI

Year	Cycle Rickshaws	Tongas	Rehras	Hand Carts	Bullock Carts	Cumulative Cycl. Rickshaw Trolleys	Total Slow Moving Vehicles
1984	2115	1495	418	5702	929	5432	16,091
1985	1373	1354	346	6517	775	6305	16,670
1986	3628	1259	347	5103	771	6924	18,032
1987	5660	1173	350	4956	713	6429	19,281
1988	4179	1098	353	4993	714	5676	17,013
1989	11641	1008	276	4942	620	9382	27,869
1990	15649	974	276	4942	620	11476	33,937
1991	13030	956	266	4989	522	18198	37,961
1992	13539	927	203	5075	473	24637	44,854
1993	15429	867	190	5998	442	35576	58,502
1994	45778	867	190	4998	442	55576	87,851
1995	45778	796	205	5518	423	38925	91,645
1996	46231	679	120	5117	431	40251	92,829
1997	47000	585	144	5448	430	62745	116,352
1998	65244	545	70	5012	316	62000	133,187
1999	73038	597	40	4932	280	83541	162,328
2000	54791	451	43	4813	248	94896	155,242
2001	36544	305	46	4694	216	106251	148,056
2002	34748	276	45	4583	211	107047	146,910
2003	54300	290	39	4325	195	105489	134,638
2004	49838	400	58	5073	391	134023	189,793
2005	66195	422	62	5239	379	135872	208,169
2006	44537	321	41	1500	65	141219	187,683
2007	12170	355	57	13084	331	110887	136,884
2008	89429	242	42	3116	137	104303	197,269
2009	89429	242	42	3116	137	110887	203,474
2010	89429	242	42	3116	137	100665	193,252
2011	89429	242	42	3116	137	115000	207,587
2012	89429	242	42	3116	137	115000	207,587

Source: Official figures as provided by M.C.D. Figure for later years is not available.

The number of slow moving vehicles stood at about 207,587 (Table 2.3) as per figures provided by the MCD.

- With a mix of slow and fast moving traffic on the roads, travel by non-motorized means like bicycles and rickshaws is unsafe.
- Data indicates that although approx. 35% of population of Delhi owns cycles, only approx. 4.5% of them use cycles for commuting due to lack of safe cycling facilities or cycle-parking facilities. Inadequate cycling facilities are slowly pushing the population to depend on the use of motorized private vehicles, thereby causing loss to environment, health and life in far greater numbers than was the case two decades earlier.
- With fewer cycling means, people tend to spend comparatively more money to reach the bus/metro station than on the bus/metro fare. The road fatalities of cyclists are on the rise every year and lack of dedicated cycling infrastructure, is enough incentive for them to switch to motorized transport.
- **Delhi has witnessed a sizable increase in the number of e-rickshaws in the last few years. Powered by electric motors and batteries, these e-rickshaws have become popular for first and last mile connectivity, especially to and from metro stations in Delhi.**



Delhi – Ownership of vehicles vs Use of vehicles
Source : Census 2011

Chart - 2.1(b)

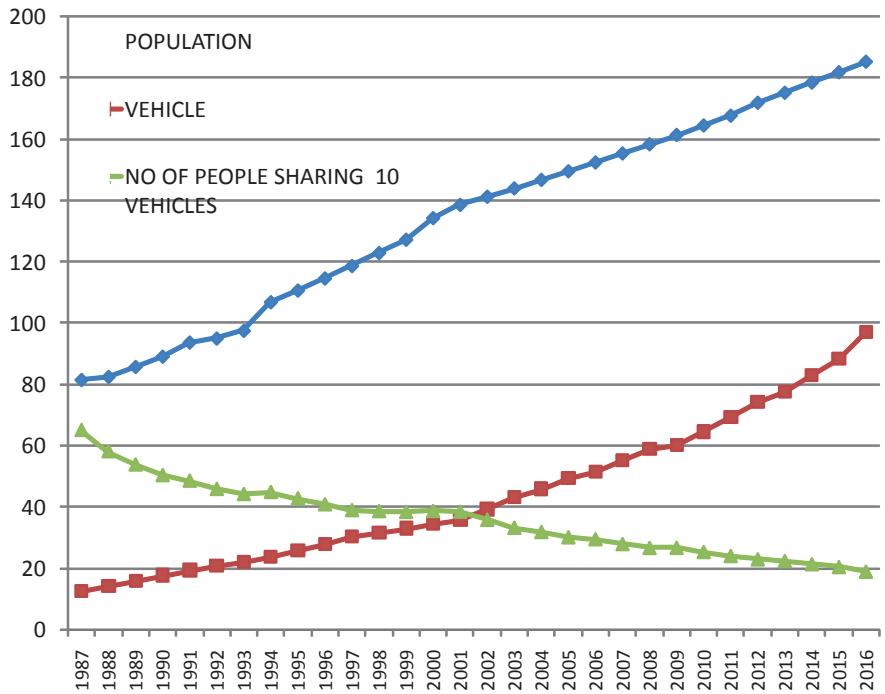
Besides huge number of vehicles belonging to Delhi, a large number of vehicles registered outside Delhi including satellite towns of Gurgaon, Faridabad, Sonipat, Rohtak, Noida and Ghaziabad also travel to and fro on Delhi roads daily.

- Hence, the actual traffic volume in Delhi is much higher and is increasing steadily.
- **Vehicles registered in Haryana were responsible for the highest number of fatal accidents in Delhi among other state vehicles. Out of a total 1548 fatal accidents, 167 were caused by vehicles registered in Haryana.**
- Vehicles registered in Delhi were involved in 515 fatal accidents (Table 4.5). However, a major part of fatal accidents were caused by unknown vehicles (647 fatal accidents).

Population and Road Accident trends: -

Chart 2.2

GROWTH OF VEHICLES AND POPULATION



- The estimated total population of Delhi is 18,510,594 at the end of the year 2016. Hence, the population density in Delhi is more than 12,400 persons per sq. Km. Likewise the per capita registered vehicles in Delhi, it comes very close to having **1 vehicle for every 2 persons in the city (1 : 2.1) (Chart 2.2).**

Though total accidents (all types) have showed a declining trend for the last 8 years, in 2013 and 2014 the total number of accidents showed an increase.

- **The fatalities however have been showing a downward trend for last 7 years.** The road accident fatality rate has also witnessed a consistent reduction since 2009. **In 2016, fatality rate remained lowest in last 30 years (8.59).**
- The average annual human **population growth remained below 2% during the last 10 years but the average annual vehicular population growth revolved between 4-10 % (barring year 2009) (Table No. 2.4 and 2.5). The road length has more or less remained the same.** This huge gap between two vital components has affected road traffic adversely. Increasing human as well as vehicular population is creating multi prong issues for the city – from huge pressure on civic infrastructure to space crunch everywhere, particularly on roads.

TABLE - 2.4
ROAD ACCIDENT TRENDS

Year	Population (Cumulative)	Motor Vehicles (Cumulative)	Fatal Accidents	Total Accidents (All Types)	Road Deaths (Per Year)	Fatality Rate		Accident Severity*
						Per one lakh population	Per 10000 vehicles	
1987	8,151,000	1,250,755	1198	6238	1271	15.59	10.16	20.37
1988	8,250,000	1,415,931	1403	6716	1474	17.87	10.41	21.94
1989	8,575,000	1,589,795	1460	7192	1581	18.44	9.94	21.98
1990	8,910,000	1,764,558	1559	7689	1670	18.74	9.11	21.71
1991	9,370,000	1,923,787	1651	8065	1778	18.97	8.92	22.04
1992	9,500,000	2,064,682	1628	8519	1727	18.17	8.36	20.27
1993	9,750,000	2,198,908	1686	8503	1783	18.28	8.10	20.96
1994	10,680,900	2,372,990	1790	9050	1884	17.64	7.94	20.81
1995	11,061,700	2,575,731	1981	10138	2070	18.71	8.04	20.41
1996	11,454,800	2,793,605	2223	11315	2361	19.96	8.18	20.86
1997	11,860,900	3,033,045	2224	10957	2342	19.19	7.50	21.37
1998	12,281,400	3,167,044	2102	10211	2182	17.88	6.90	21.36
1999	12,716,800	3,302,044	1974	9909	2045	16.08	6.19	20.63
2000	13,418,756	3,456,579	1943	10245	2014	15.01	5.82	19.65
2001	13,850,507	3,589,748	1768	9344	1842	13.29	5.13	19.71
2002	14,116,436	3,925,771	1625	8699	1696	12.01	4.35	19.49
2003	14,387,472	4,309,403	1731	8864	1801	12.51	4.18	20.31
2004	14,663,711	4,582,499	1929	9092	1832	12.49	4.00	20.14
2005	14,945,255	4,937,354	1966	9374	2049	13.71	4.14	21.85
2006	15,232,203	5,138,711	2135	9294	2169	14.24	4.22	23.33
2007	15,524,662	5,533,024	2081	8620	2140	13.78	3.86	24.82
2008	15,822,735	5,904,015	2015	8435	2093	13.23	3.55	24.81
2009	16,126,532	6,011,731	2272	7516	2325	14.42	3.87	30.93
2010	16,436,161	6,451,883	2104	7260	2153	13.10	3.34	29.65
2011	16,753,235	6,932,706	2047	7280	2110	12.59	3.05	28.98
2012	17,174,897	7,438,155	1822	6937	1866	10.86	2.51	26.89
2013	17,499,502	7,774,403	1778	7566	1820	10.40	2.34	24.05
2014	17,830,242	8,293,167	1629	8623	1671	9.37	2.01	19.37
2015	18,167,233	8,827,431	1582	8085	1622	8.93	1.84	20.06
2016	18,510,594	9,704,741	1548	7375	1591	8.59	1.63	21.57

Note: - * Accident Severity: Road Accident deaths per 100 accidents.

TABLE – 2.5

% GROWTH IN POPULATION, MOTOR VEHICLES AND ACCIDENTS

(All figures in Percent)

Year	Population	Motor Vehicles	Road Deaths	Total Accidents
1987	4.21	16.29	-0.39	-4.72
1988	4.18	13.21	15.97	7.66
1989	4.15	12.28	7.26	7.09
1990	4.12	10.99	5.63	6.91
1991	3.79	8.28	6.47	4.89
1992	3.57	7.32	-2.87	5.63
1993	3.56	6.50	3.24	-0.19
1994	3.56	7.92	5.66	6.43
1995	3.56	8.54	9.87	12.02
1996	3.55	7.80	14.06	11.61
1997	3.54	8.57	-0.80	-3.16
1998	3.54	4.42	-6.83	-6.75
1999	3.54	4.08	-6.51	-3.01
2000	5.52	4.67	- 1.51	3.39
2001	3.12	3.85	- 8.54	-8.79
2002	1.88	9.36	- 7.93	-6.90
2003	1.87	9.77	6.19	1.90
2004	1.88	6.34	1.72	2.67
2005	1.89	7.74	11.84	3.11
2006	1.86	4.08	5.86	- 0.90
2007	1.90	7.67	- 1.34	- 7.32
2008	1.89	6.71	- 2.20	- 2.12
2009	1.87	1.82	11.08	-10.90
2010	1.88	7.32	-7.40	-3.41
2011	1.89	7.45	-2.04	0.28
2012	2.45	7.29	-13.08	- 4.95
2013	1.89	4.52	- 2.46	9.07
2014	1.90	6.67	- 8.18	13.97
2015	1.88	6.44	- 2.93	- 6.23
2016	1.89	9.93	-1.91	-8.78

ROAD DEATHS ON DELHI ROADS
(1987-2016)

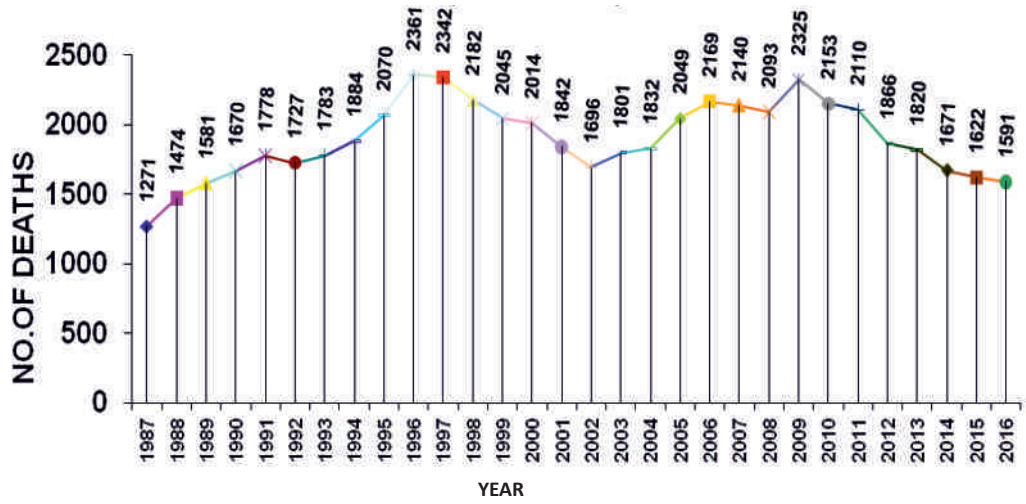


Chart - 2.3

FATALITY RATE - PER ONE LAC POPULATION
(1987-2016)

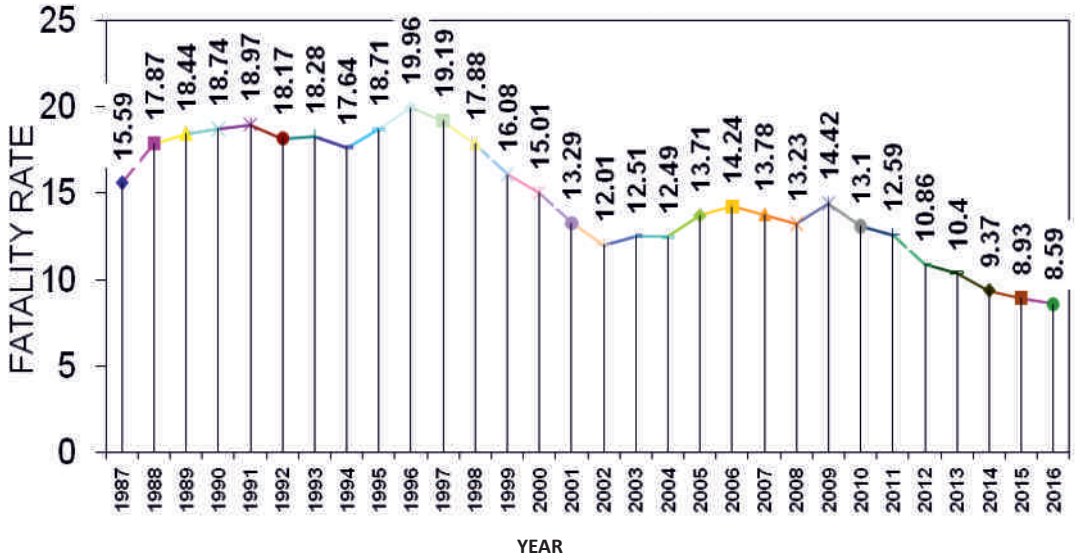


Chart - 2.4

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