

Road Accidents in India

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Abstract— The road accident scene in India, as in many developing countries, is characterized by mixed traffic comprising human-powered vehicles such as bicycles and tricycles (cycle rickshaws), animal-drawn carts, and motor vehicles of various sizes and speeds. Different kinds of models built in various countries to study the accident scene have been discussed. It is shown that these models are not comprehensive in accounting all the variable associated with the traffic accident scene. It has also been shown that a large number of variables are to be used to study the accident scenes of Indian urban roads. Variable such as handrail index, congestion index, bycelane index, pedestrian violators, disturbance index, intersection between different kinds of modes, road features etc. are considered as independent variables inflecting the accident scenes. Multiple Linear Regression approach is selected as the suitable approach to build the model to account all variables. Delhi City are considered for detailed analysis. Data collected from 2017 to 2018 have been used to build the model and evaluate its effectiveness. Statistical techniques have been used to study its accent ability. The model recommended for estimating road traffic accidents in an urban arterial for six-month period has fifteen independent variables. The model is found to estimate the accident scenes with a variation of 10% .In most of the cases. The model has been used to estimate the future accident scene. It has also been shown how introduction of bicycle track and pedestrian guard handrails along kerbs could change the accident scene.

Key words: Road Traffic Accident, Accidents, Epidemiological Study, Trauma, Injuries

I. INTRODUCTION

Transport plays an important role in the economic development of any region. Economic growth that result in higher incomes and a rising living standards are expected to create greater demands for travel for both work and non-work/leisure purposes. This is turn can create congestion and reliability problems on the transport network, increasing costs on business and damaging quality of life. As road transport provides door-to-door connection and flexible movement of goods and passengers, its patronage by people are on the rise day by day. The quality of life now greatly depends on the quality of roads. Road accidents are one of the major causes of death, injury and disability in all over the world both in developed and developing countries. With a broad estimate, in every one minute, two people are killed and 95 people are severely injured or permanently disabled in traffic accidents worldwide. Traffic accident related deaths and injuries result in not only substantial economic losses but also serious physical and mental sufferings. Developing countries are much more affected from traffic than developed countries. According to the World Health Organization (WHO) statistics, 75 Per cent of deaths resulted from traffic accidents occurring in developing countries, although they own only 32

Per cent of the motor vehicles in the world. While the annual fatality per 10,000 vehicles ranges from 20 to 200 in low or middle income countries, it varies between 1.5 and 5 in industrialized countries. The estimated global economic cost of traffic accidents is \$518 billion per year. The share of the developing countries is \$100 billion which accounts for 1 to 3 Per cent of their gross national product. Road traffic crashes occur on all continents and in every country of the world.

Every year they take the lives of more than a million people and incapacitate many millions more. Pedestrians, users of non-motorized vehicles—including bicycles, rickshaws, carts and motor cyclists in low-income and middle-income countries carry a large proportion of the global burden of road traffic death and serious injury.

II. GROWTH OF VEHICLES IN INDIA

India has the second largest road network across the world at 5.4 million km. This road network transports more than 60 per cent of all goods in the country and 85 per cent of India's total passenger traffic. Road transportation has gradually increased over the years with the improvement in connectivity between cities, towns and villages in the country.

The Indian roads carry almost 90 per cent of the country's passenger traffic and around 65 per cent of its freight. In India sales of automobiles and movement of freight by roads is growing at a rapid rate.

A. Production

The industry produced a total 29,075,605 vehicles including Passenger Vehicles, Commercial Vehicles, Three Wheelers, Two Wheelers and Quadri cycle in April-March 2018 as against 25,330,967 in April-March 2017, registering a growth of 14.78 percent over the same period last year.

B. Domestic Sales

The sale of Passenger Vehicles grew by 7.89 percent in April-March 2018 over the same period last year. Within the Passenger Vehicles, Passenger Cars, Utility Vehicle and Vans grew by 3.33 percent, 20.97 percent and 5.78 percent respectively in April-March 2018 over the same period last year.

The overall Commercial Vehicles segment grew by 19.94 percent in April-March 2018 as compared to the same period last year. Medium & Heavy Commercial Vehicles (M&HCVs) grew by 12.48 percent and Light Commercial Vehicles grew by 25.42 percent in April-March 2018 over the same period last year.

Three Wheelers sales grew by 24.19 percent in April-March 2018 over the same period last year. Within the Three Wheelers, Passenger Carrier & Goods Carrier sales registered a growth of 28.65 percent and 7.83 percent respectively in April-March 2018 over April-March 2017.

Two Wheelers sales registered a growth at 14.80 percent in April-March 2018 over April-March 2017. Within the Two Wheelers segment, Scooters and Motorcycles grew by 19.90 percent and 13.69 percent respectively, while Mopeds declined by (-) 3.48 percent in April-March 2018 over April-March 2017

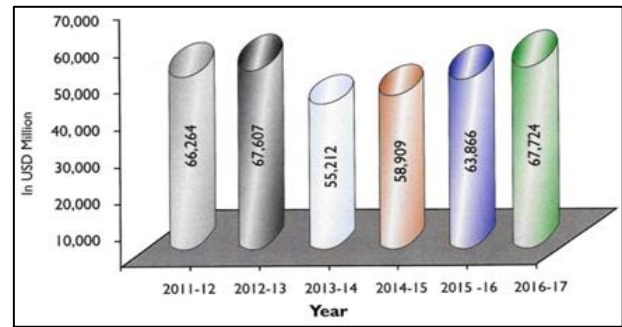


Fig. 1: Gross Turnover of Manufacturers in India
2011-12 TO 2016-17

Category	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Passenger Vehicles	26,65,015	25,03,509	26,01,236	27,89,208	30,47,582	32,87,965
Commercial Vehicles	7,93,211	6,32,851	6,14,948	6,85,704	7,14,082	8,56,453
Three Wheelers	5,38,290	4,80,085	5,32,626	5,38,208	5,11,879	6,35,698
Two Wheelers	1,37,97,185	1,48,06,778	1,59,75,561	1,64,55,851	1,75,89,738	2,01,92,672
Grand Total	1,77,93,701	1,84,23,223	1,97,24,371	2,04,68,971	2,18,62,128	2,49,72,788

Table 1: Automobile Domestic Sales Trends

III. ECONOMIC LOSS DUE TO ACCIDENTS

Indian economy takes a 3% hit every year due to road traffic accidents, which is over \$58,000 million in terms of value,” the study said. India is only behind Japan (\$63,000 million) in terms of value while in terms of GDP loss, it comes behind Iran which is at 6% (\$30,697 million), it added. The total loss to GDP to these nations is to the tune of \$2,93,568 million annually,” UNESCAP chief of transport policy and development section Peter O’Neill said. He was speaking at a three-day conference organised by the Institute of Road Traffic Education (IRTE) here.

India suffers a staggering hit of Rs. 1 lakh crore (USD 20 billion) every year due to road accidents, according to the International Road Federation (IRF), which says the country lacks "political will" to tackle the menace.

"The losses due to road accidents have crossed Rs. 1 lakh crore annually. The sad part is the establishment knows it. These figures are present in their own records and despite this, there`s no political will to resolve the problem

IV. LICENSED VEHICLES IN DELHI

The number of registered vehicles in the National Capital has crossed the one-crore mark, amid growing concerns over rising pollution levels and poor traffic conditions in the city.

Class description	Year 2013-14	Year 2014-15	Year 2015-16	Year 2016-17	Total
Agricultural Tractor	25	74	82	28	209
Ambulance	142	76	73	63	354
Bus	1254	1023	702	877	3856
Cash Van	0	0	0	36	36
Crane Mounted Vehicle	42	21	61	0	124
Educational Institution Bus	0	0	0	2	2
e-Rickshaw(P)	0	0	8557	20566	29123
e-Rickshaw with Cart (G)	0	0	0	48	48
Fire Fighting Vehicle	0	0	0	9	9
Goods Carrier	11465	13824	14944	11503	51736
Invalid Carriage	40	60	89	91	280
Luxury Cab	363	452	316	126	1257

Data accessed from the Transport Department of Delhi government puts the total number of registered vehicles at 1,05,67,712 till May 25. There are 31,72,842 registered cars in the city. The biggest chunk of the registered vehicles — 66,48,730 — in the city is, however, motorcycles and scooters that are known as major air polluters due to poor emission standards. Other major categories of registered vehicles in the National Capital include goods carriers (2,25,438), motor cab (1,18,424), moped (1,16,092), passenger three-wheelers (1,06,082), goods three-wheelers (68,692), buses (35,332), e-rickshaws (31,555) and maxi cabs (30,207).

Concerned over the increasing level of air pollution in Delhi, the National Green Tribunal had on November 26, 2014 barred all vehicles – private cars, bikes, commercial vehicles, buses and trucks – over 15 years old from plying in the Capital.

In its recent audit study, EPCA (Environmental Pollution - Prevention and Control) had also found that Delhi has lakhs of vehicles plying without the mandatory 'pollution under control' certificates. The blatant violations, that potentially imperil the health of millions, have put the spotlight on around 970 centres in the city, that are certified to check the emission content of around 70 lakh vehicles in the city.

Maxi Cab	1560	1847	1888	879	6174
M-Cycle/Scooter	337835	372462	431184	443417	1584898
M-Cycle/Scooter-With Side Car	26	27	69	70	192
Mobile Workshop	0	10	8	0	18
Moped	5754	6008	4273	5361	21396
Motor Cab	5841	9509	24128	26836	66314
Motor Car	157789	169813	171520	157513	656635
Motorised Cycle (CC > 25cc)	0	0	2	5	7
Private Service Vehicle (Individual Use)	0	0	3	0	3
Omni Bus	0	0	0	19	19
Recovery Vehicle	5	2	10	31	48
Three Wheeler (Goods)	2325	2647	16014	3921	24907
Three Wheeler (Passenger)	4955	10486	9	9871	25321
Three Wheeler (Personal)	4	8	0	3	15
Tractor (Commercial)	141	0	0	0	141
Sum	529566	588349	673932	681275	2473122

Table 2: Total Vehicles registered Catg Year-wise during 01-apr-2013 to 25-mar-2017

V. TRAFFIC ACCIDENTS

Road accidents in the Capital claimed less lives in 2017 compared to the previous year. The Delhi Police, in its annual press conference, revealed that the numbers could be brought down as more than 3,000 challans were imposed every day on those riding without a helmet and around 1,500 for not wearing a seat belt.

Releasing data, Delhi Police Commissioner, Amulya Patnaik said that in 2017, 157 accidents were of non-injury, while 1,474 were fatal, against 124 non-injury accidents reported in 2016 and 1,487 fatal accidents. 1,505 lives were claimed by road accidents in 2017, while the number was 1,530 in 2016.

Releasing the figures that brought down the road accidents and disciplined the traffic in the Capital in 2017,

Fatal	Deaths	Challans -
2016 -1487	2016 -1530	Not using seat belt 5,93,865
2017 -1474	2017 -1505	Red Light Jumping 1,64,320
		Over speeding 1,34,301
		Rider without helmet 10,61,912
		Improper parking 10,37,325

Table 3: Traffic Accidents

VI. CONCLUSIONS

There is clearly a need for road safety education and it should be directed towards road users, who are frequently involved and injured in RTAs (e.g. students). An integrated programme of road safety education is suggested.

- Pre-school children may be introduced to the elementary concepts of road safety through stories involving the animal world.
- Primary school children may be given practice guidance on the use of sidewalks and road crossing techniques.
- For middle school students - road signs and bicycle riding.
- High school students can be taught about reaction time, braking distance, defensive driving and hazards of alcoholic drinks. Road side random breath testing for alcohol should be done by using breath analysers, which can be confirmed by blood concentration level of alcohol. The real pressure and motivation to improve

Special Commissioner of Police, Dependra Pathak said that a number of special drives were undertaken in 2017. "For not using a seat belt, 5,93,865 challans were imposed while 1,64,320 for red-light jumping, 1,34,301 for over-speeding and 10,61,912 for riders without a helmet were challaned. To ensure smooth traffic flow, 10,37,325 challans were imposed against improper parking," Pathak stated.

The special commissioner further added that 43,977 people were found without driving license, 72,029 violating restriction of timings, 1,50,357 cases of triple riding, 4,73,390 were caught riding pillion without a helmet and 2,25,379 cases of dangerous driving were detected. "All of these law violators were challenged. Apart from these, 30,301 challans against drunken driving, 1,88,193 for carrying the load more than permitted, 7,051 for wrongly overtaking and 15,182 for using a mobile phone while driving," Pathak said.

driving skills can come only through licensing authorities by adopting stricter, more comprehensive and scientifically based test laying a stress on road rules, regulations and traffic control devices. At the time of giving license to the public transport drivers (Bus and Trucks), they can be given training in first-aid skills so that victims are attended immediately in the post-accident period.

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