

Study of Traffic and Road Maintenance in India

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1 INTRODUCTION

According to official statistics 141,526 persons were killed and 477,731 injured in road traffic crashes in India in 2014(NCRB, 2015). However, this is probably an underestimate, as not all injuries are reported to the police(Gururaj, G., 2006, Mohan, D. et al., 2009). The actual numbers of injuries requiring hospital visits may be 2,000,000-3,000,000 persons. The basis for these estimates is given in later section. The situation in India is worsening and road traffic injuries (RTI) have been increasing over the past twenty years (Figure 1). This may be partly due to the increase in number of vehicles on the road but mainly due to the absence of coordinated evidence-based policy to control the problem. These data show that the number of fatalities has continued to increase at about seven percent a year over the past decade except over the last couple of years

2 VEHICAL POPULATION

Fig shows the rate of increase in motor vehical according to official data-

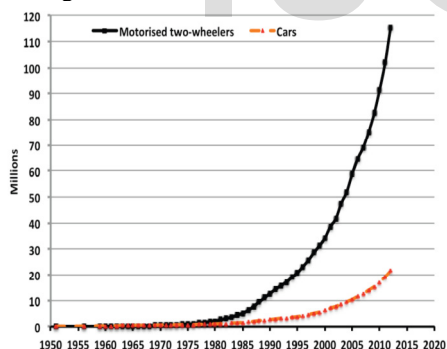


Figure 2. Cars and MTW registered in India by year (Source: Transport Research Wing 2014).

The actual number of personal vehicles on the road is estimated to be 50%-55% of those on the records. The number of cars and motorised two-wheelers (MTW) registered in 2012 was 21.6 and 115.4 million respectively.

3 WHY IS MAINTENANCE IMPORTANT?

Roads are among the most important public assets in many countries. Road improvements bring immediate and sometimes dramatic benefits to road users through improved access to hospitals, schools, and markets; improved comfort, speed, and safety; and lower vehicle

operating costs. For these benefits to be sustained, road improvements must be followed by a well-planned program of maintenance.

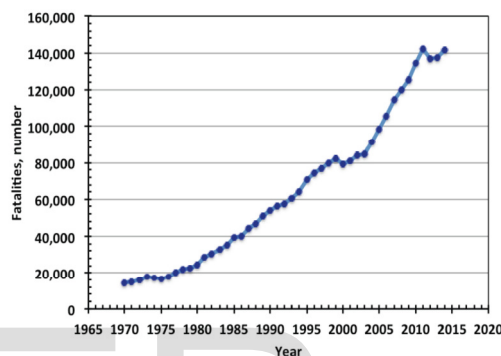


Figure 1. Road traffic deaths in India 1970 through 2014 (Source: NCRB).

Fig 2 shows the traffic deaths in india sine 1970-2014.

Without regular maintenance, roads can rapidly fall into disrepair, preventing realization of the longer term impacts of road improvements on development, such as increased agricultural production and growth in school enrollment.

Postponing road maintenance results in high direct and indirect costs. If road defects are repaired promptly, the cost is usually modest. If defects are neglected, an entire road section may fail completely, requiring full reconstruction at three times or more the cost, on average, of maintenance costs.

Countries need a core road network that carries about 80 percent of national traffic, including key roads in urban areas and roads providing sufficient access to rural areas. Some part of the overall road budget thus has to be spent on construction and some part on maintaining the core network. But many countries have tended to favor new construction, rehabilitation, or reconstruction of roads over maintenance. This has led to a steady increase in the backlog of road repairs and a loss of development impact.

4 RESEARCH OBJECTIVES AND METHODOLOGY

The Indian Roads Congress defines road maintenance as “routine work performed to upkeep pavement, shoulders and other facilities provided for road users, as nearly as possible in their constructed conditions

under normal conditions of traffic and forces of nature". Maintenance is "essential to get optimum service from the pavement structure during its life period."

Maintenance ensures that the road remains serviceable throughout its design life. Maintenance is important because it:

- ✓ reduces the rate of deterioration, thereby safeguarding previous investments in construction and rehabilitation,
- ✓ lowers the cost of operating vehicles on the road by providing a smooth running surface,
- ✓ improves the reliability of the road allowing it to remain open for traffic on a continuous basis and thus contributes to more reliable transport services, and
- ✓ sustains social and economic benefits of improved road access.

5 TYPES OF MAINTENANCE

Road Maintenance operations are usually grouped according to planning, organizational and funding arrangements. They can normally be categorized as Routine, Periodic or Emergency maintenance operations.

5.1 Routine Maintenance

Required continually on every road whatever its engineering characteristics or traffic volume. Routine maintenance activities are usually small-scale, widely dispersed, and often performed using manual labour. The need for routine maintenance can to a large degree be forecasted and is scheduled at fixed times during the year.

5.2 Periodic Maintenance is carried out in addition to the routine maintenance and will need a more comprehensive overhaul of the road after a certain number of years. It involves more comprehensive and costly activities such as reshaping of the road surface, re-surfacing and major repair or reconstruction of cross-drainage structures and require more equipment and specialist skills. The periodic maintenance works would be scheduled at intervals of 3 to 7 years, depending on traffic levels, pavement type, geographical and weather conditions, quality of the road and the level of wear and tear.

5.3 Emergency Maintenance responds to occasional, unforeseen events such as landslides, washouts, large trees or debris on the road and broken drainage structures. Emergency maintenance can be categorised into (i) temporary restoration works, re-opening safe passage on the road, and (ii) permanent restoration, securing the stability of the road and reinstating all its components to its former (or a better) condition.

6 DATA COLLECTION

6.1 Traffic Accidents

- A total of 4,96,762 'Traffic Accidents' were reported during the year which include 4,64,674(93.5%) 'Road Accidents', 2,669(0.5%) 'Railways Crossing Accidents' and 29,419 (5.9%) 'Railway Accidents'. The traffic accidents caused injuries to 4,86,567 persons and 1,77,423 deaths during 2015.
- The percentage share of deaths in traffic accidents due to 'Road Accidents', 'Railways Accidents' and 'Railway Crossing Accidents' was reported as 83.8% (1,48,707 deaths), 14.7% (26,066 deaths) and 1.5% (2,650 deaths) respectively during 2015.
- It observed that the rate of deaths per thousand vehicles has decreased from 1.0 in 2011 to 0.8 in 2015.
- Maximum number of traffic accidents occurred in the month of May (45,215) and as per time period wise analysis, maximum number of traffic accidents (80,113) were reported during 1500 hrs to 1800 hrs(day) of day.

6.2 Road Accidents

- 53 cases of road accidents took place every one hour during 2015, wherein 17 persons were killed.
- During 2015, a total of 4,64,674 cases of 'Road Accidents' were reported which rendered 4,82,389 persons injured and 1,48,707 deaths.
- Deaths due to 'Road Accidents' in the country have increased by 5.1% during 2015 (1,48,707) over 2014 (1,41,526).
- Tamil Nadu (69,059 cases), followed by Karnataka (44,011 cases), Maharashtra (42,250 cases), Madhya Pradesh (40,859 cases) and Kerala (39,014 cases) have reported the maximum number of road accidents accounting for 14.9%, 9.5%, 9.1%, 8.8% and 8.4% of such accidents in the country respectively.
- Maximum fatalities in road accidents were reported in Uttar Pradesh at 12.4% (18,407 out of 1,48,707) followed by Tamil Nadu (10.5%) and Maharashtra (9.2%) during 2015.
- 29.3% victims of road accidents were riders of 'Two Wheelers'. 'Trucks/Lorries', 'Cars' and 'Buses' have accounted for 19.4%, 12.4% and 8.3% of road accidental deaths respectively.
- The National Highways accounted for 28.2% of total road accidents, followed by State Highways (25.0%).
- Most of road accidents were due to over speeding accounting for 43.7% of total accidents which caused 60,969 deaths and 2,12,815 persons injured. Dangerous/careless driving or overtaking caused 1,46,059 road accidents which resulted in 48,093 deaths and

1,51,231 persons injured during 2015. Besides, 3.7% of road accidents were due to poor weather condition.

- A total of 262 accidental deaths were reported at un-manned railways crossing during 2015.
- A total of 2,54,878 cases and 2,09,796 cases of road accidents were reported in rural areas and urban areas, accounting for 54.9% and 45.1% of total road accidents in the country respectively during 2015. Most of the road accidents were reported at a place near to residential area (24.7% in rural areas and 24.5% in urban areas).

7 DRIVER SURVEY

Driving in most cities in India is no less than negotiating a war zone. While the lack of proper infrastructure is one of the major causes for the chaos on our roads, our driving habits aren't exactly refined either. The problem though is that most Indian drivers consider themselves to be safe and that is where the gross overestimation of driving skills and underestimation of safety hazards springs from. In a recent survey commissioned by Ford in India that took inputs from over 1,000 drivers -- both male and female -- in New Delhi, Mumbai, Bangalore, Chennai, Chandigarh and Ahmedabad, 94% of the demographic asserted themselves as safe drivers but more than 70% of them also admitted to having some kind of unsafe driving habits. About 67% said they exceed the speed limit and talk on their mobile phones, while over 50% admitted to texting or accessing their emails or mobile apps. This brings to light the need for better education of safe driving practices in the country which needs to be brought about on a grassroots level. Indians are also open to adopting technology to make driving habits safer though as over 80% of those surveyed showed interest in voice-activated systems, parking sensors, collision prevention systems, seat belt reminders and automated driving vehicles in the future. While educating drivers on safer driving habits is of the utmost importance, one cannot neglect the fact that having advanced technology in your car can help prevent accidents to a great extent as well.

7.1 In the fast lane

- Admit to dangerous driving behaviour **70+ %**
- Exceed speed limit **67 %**
- Talk on hand-held phone while driving **67 %**
- Text while driving **55 %**
- Access email/mobile apps on hand-held phone while driving **52 %**
- Apply makeup while driving (female) **31 %**

8 PRACTICE POINTS

Some of the policy options are outlined below.

Pedestrian and bicyclist safety

1. Reserving adequate space for non-motorized modes on all roads where they are present.

2. Free left turns must be banned at all signalized junctions. This will give a safe time for pedestrians and bicyclists to cross the road.

3. Speed control in urban areas: maximum speed limits of 50 km/h on arterial roads need to be enforced by road design and police monitoring, and 30 km/h in residential areas and by judicious use of speed-breakers, dead-end streets and mini roundabouts.

4. Increasing the conspicuousness of bicycles by fixing reflectors on all sides and wheels and painting them yellow, white or orange.

9 CONCLUSION

The only effective way to get most motorists to use safety belts is with good laws requiring their use and sustained enforcement. When laws are in place, education and/or advertising can be used to inform the public about the laws and their enforcement.

In general, the deterrent effect of a law is determined in part by the severity and swiftness of the penalty for disobeying it, but a key factor is the perceived likelihood of being detected and sanctioned. Laws against drinking and driving are effective when combined with active enforcement and the support of the community. Road-safety campaigns often aim to improve road-user behaviour by increasing knowledge and by changing attitudes. There is no clearly proved relationship between knowledge and attitudes on the one hand and behaviour on the other. Most highway safety educational programmes do not work. They do not reduce motor-vehicle crash deaths and injuries. Only a few programmes have ever been shown to work, and contrary to the view that education cannot do any harm, some programs have been shown to make matters worse. Driver or pedestrian education programmes by themselves usually are insufficient to reduce crash rates. They may increase knowledge, and even induce some behavior change, but this does not seem to result in a reduction in crash rates. There is, however, no reason to waste money on general campaigns. Campaigns should be used to put important questions on the agenda, and campaigns aimed at changing road-user behaviour should be focused on clearly defined behaviours and should by preference fortify other measures such as new legislation and/or police enforcement.

Helmet use reduces bicycle-related head and facial injuries for bicyclists of all ages involved in all types of crashes, including those involving motor vehicles.

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