

Road Traffic Injuries: Independent of Motorization, Rising Population and Expansion of Road Network

[Raj R.D. Kirori¹, Sanklap Swami², Prof. B.L. Swami³]

Abstract—Developing countries generally consider that rapid motorization, rising population and expansion of road network are also significant contributors, besides other causes, to increased road traffic fatalities and injuries as travel risks are further increased.

Over 90 per cent of road traffic fatalities of 1.3 million fatalities in world, occur in low and middle income countries which have 60 per cent of the world's vehicles whereas 7 per cent fatalities in high income countries having 40 per cent vehicles and 15 percent population of world.

Journey through Decade of Action for global road safety aiming 50 percent reduction in road fatalities by year 2020, but most of developing countries are still far from achieving targeted reduction. In contrast, leading road safety nations have successfully demonstrated that road traffic fatalities can be reduced substantially by implementation of safe system approach based structured and well defined road safety management. As a result 17 developed nations brought down road fatalities below 5 persons per 100,000 population whereas developing countries are reporting fatalities much higher than 10 persons per 100,000 population.

United Kingdom recorded 7000 road fatalities in 1931 when the country had just 2.3 million motor vehicles and population was 45.89 million. However, as a result of high level political commitment, legislations, institutional arrangements, research, could systematically reduce road fatalities to less than 1800 persons despite 37.2 million motor vehicles and 65.65 million population in year 2016.

The paper describes exemplary road safety performance of developed nations which suggest that road fatalities can be drastically reduced by adopting a safe system approach and fatalities are independent of rapid motorization, growing population. The paper also presents global and Indian scenario of road fatalities, motorization and population.

Keywords—road traffic injuries, safe system approach, road safety management.

Raj R.D. Kirori, Ph. D. Scholar,
Department of Civil Engineering,
Malaviya National Institute of Technology, Jaipur-302017, India

Sanklap Swami,
Master Research Student, Civil Engineering
North Carolina State University, Raleigh, Zip code 27606, NC, USA

B.L. Swami, Professor,
Department of Civil Engineering,
Malaviya National Institute of Technology, Jaipur-302017, India

I. Introduction

Road safety is a serious issue in world as road fatalities in world have increased to 1.3 million persons in the year 2016 and over 50 million persons suffered non-fatal injuries including disabilities, life-altering injuries with long lasting adverse effects on individuals and society¹.

Importantly over 90 per cent of road traffic fatalities occur in low and middle income countries which have 60 per cent of the world's vehicles whereas 7 per cent fatalities in high income countries having 40 per cent vehicles¹ as shown in Fig. 1 below.

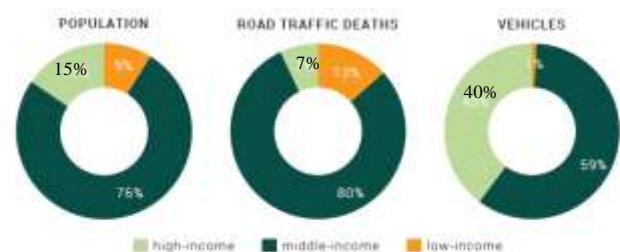


Fig 1: Proportion of population, road traffic deaths and motor vehicles by country income categories*, 2016

Source: Reproduced from Global Status Report on Road Safety, 2018¹ (WHO)

*Income levels are based on 2017 World Bank classification :

(1) Low income country- Gross National Income per capita US \$1005 or less;

(2) Middle income is Gross National Income per capita US \$1006 to US \$12275 and

(3) High income is Gross National Income per capita US \$12276 or more.

Yet rapid motorization, rising population and expansion of road network are listed as few important causes of rising fatalities in developing countries. It appears that experience of proven road safety performance demonstrated by selected developed countries based on safe system approach has escaped attention of developing countries, including India.

It is a matter of deep concern that nearly half of all road traffic deaths are among vulnerable road users: pedestrians, motorcyclists and other non-motorized road users.

Road traffic crashes cost nearly three per cent of Gross Domestic Product (GDP)³ to developing countries. Such a negative flow of national income not only retards economic growth but also contributes to poverty and economic burden.

II. Decade of Action is ending

Decade of Action for global road safety (2011-2020) is fast reaching to an end. Leading road safety nations are successfully minimizing fatalities and advancing to achieve 'Vision Zero' during the decade as road fatalities are preventable. However, most of developing countries could

not reduce road fatalities and still far from achieving target of 50 percent reduction in road fatalities.

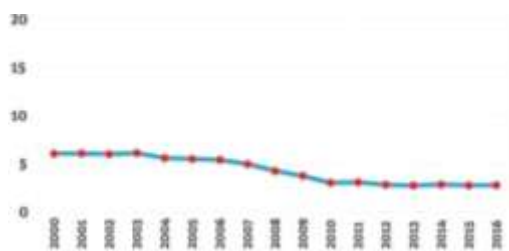
A. Safety performance by safe system

International Transport Forum OECD, (IRTAD) has released annual report publishing fatalities data of high income countries up to 20164. [India is not a member International Transport Forum (ITF).]

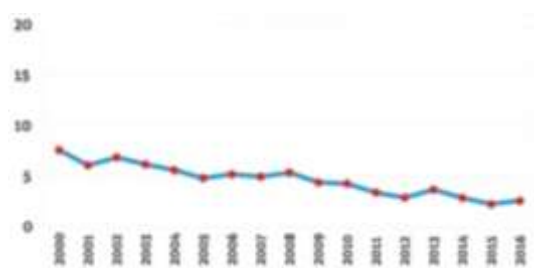
High income countries following safe system approach, have further reduced fatalities in Decade of Action. Reduction pattern in fatalities per 100,000 population from year 2000 to 17 have been presented. The performance can be divided in four groups as under:

(a) Four Countries namely UK, Norway, Sweden and Switzerland have reduced fatalities less than 3 persons per 100000 population.

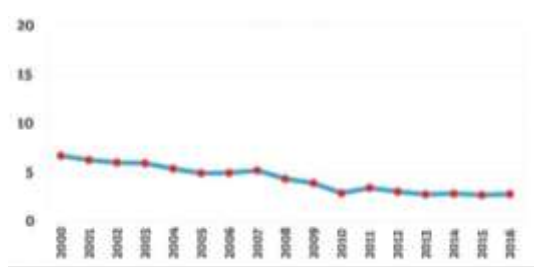
United Kingdom



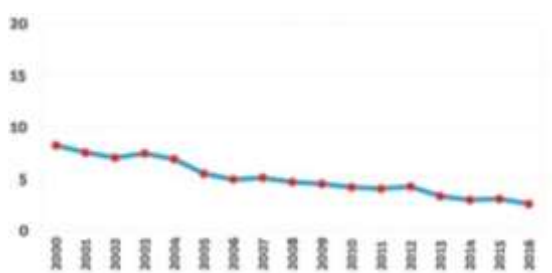
Norway



Sweden



Switzerland

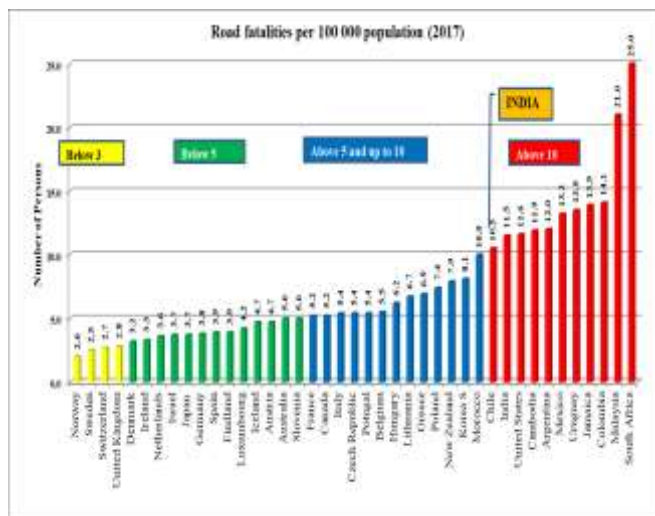


(b) Thirteen countries have reduced fatalities between 3 and 5 persons per 100000 population.

(c) Thirteen countries have reduced fatalities between 5 and 10 persons per 100000 population.

(d) Remaining countries have reduced fatalities above 10 per 100000 population.

A comparative chart is presented in Fig. 2 below.



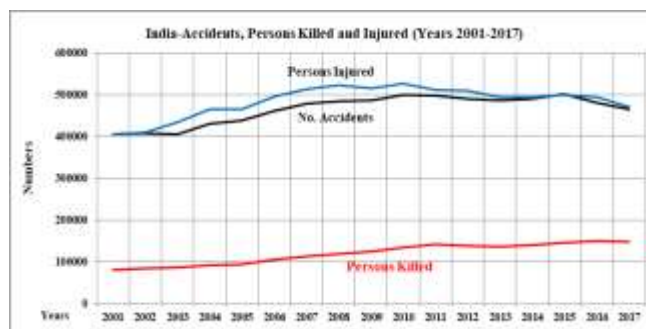
Source: Road Safety Annual Report 2018-International Transport Forum OECD, International Traffic Safety Data and Analysis Group (IRTAD) - page19. https://www.itf-oecd.org/sites/default/files/docs/irtad-road-safety-annual-report-2018_2.pdf

Fig 2: Road fatalities per 100,000 population of member countries and corresponding Indian data has been included for comparison

These four groups have been shown in yellow, green, blue and red bars in Fig. 2 above. Safe system approach to road safety could translate their vision in reality in progressively and lessons can be learnt by developing countries to reverse the fatality trends.

B. Road safety scenario in India

India reported 147,913 road fatalities in 464,910 road crashes (2017)⁵. India having a human population of 1.32 billion which own motorized vehicles over 230 million (2016) but dominated by 72 persons share of motorcycles which are prone to road crashes. India lost 11.5 persons in road crashes per 100,000 population whereas United Kingdom lost less than 3 persons per 100,000 population.



Based on Source: Road Accidents in India-2017(Annexure-1), Ministry of Road Transport and Highways, New Delhi

Fig 3: Road accidents, persons killed and injured in India since year 2001 to 2017

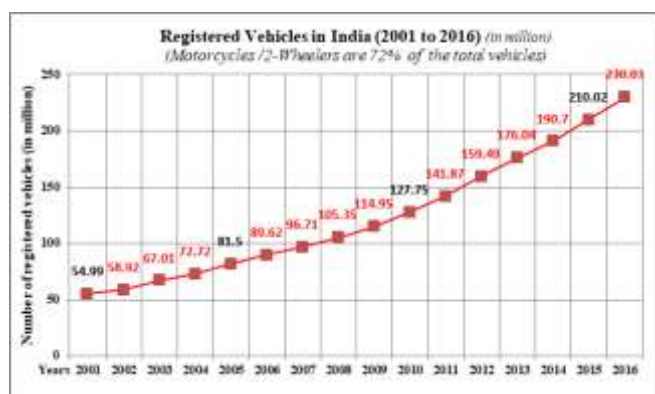
Above Fig. 3 shows that in recent past of 17 years, India has sadly lost over 2 million (2,042,181) precious human lives. Over 8 million (8,230,142) persons were injured on the road network as results of 7.91 million (7,911,807) road accidents since year 2001.

India suffered and is continuously suffering incalculable loss in road accidents in terms of grief, loss of livelihood of millions families & property, loss to state exchequer and productivity and adding to poverty.

Developing countries have similar hard facts but often list rapid motorization as one of the major cause of higher fatalities whereas motorization is a function of economic growth.

It is evident that road fatalities continued to rise during the Decade of Action for global road safety.

Fast growing Indian economy has resulted in exponential growth of vehicle population from 54.99 million in year 2001 to 230 million registered vehicles in year 2016⁶ as shown in Fig. 4 below.



Source: Road Transport Year Book (2015-16), Ministry of Road Transport and Highways of India, New Delhi⁶

Fig. 4: Registered Vehicles in India-Exponential growth Measure of motorization and International scenario

Vehicle population is measured in terms of number vehicles per 1000 persons. An international comparison is presented in Table 1 below showing selected 6 countries having top ranking economies.

Table 1. International scenario of vehicle population per 1000 persons⁶

SN	Country	4- wheel or more	2-Wheelers
1	U.S.A	790	26
2	Australia	718	33
3	Germany	609	51
4	Japan	603	92
5	United Kingdom*	517	19
6	India*	28	102

* Pertains to data for the year 2013

Source: Road Transport Year Book (Year 2015-16), Ministry of Road Transport & Highways, India

International comparison presented in Table 1, shows that India is presently far behind high income countries in vehicles (cars, trucks etc.). In India 1000 persons have just 28 vehicles (cars, trucks etc.) against over 500 vehicles (cars, trucks etc.) in United Kingdom, a road safety pioneer.

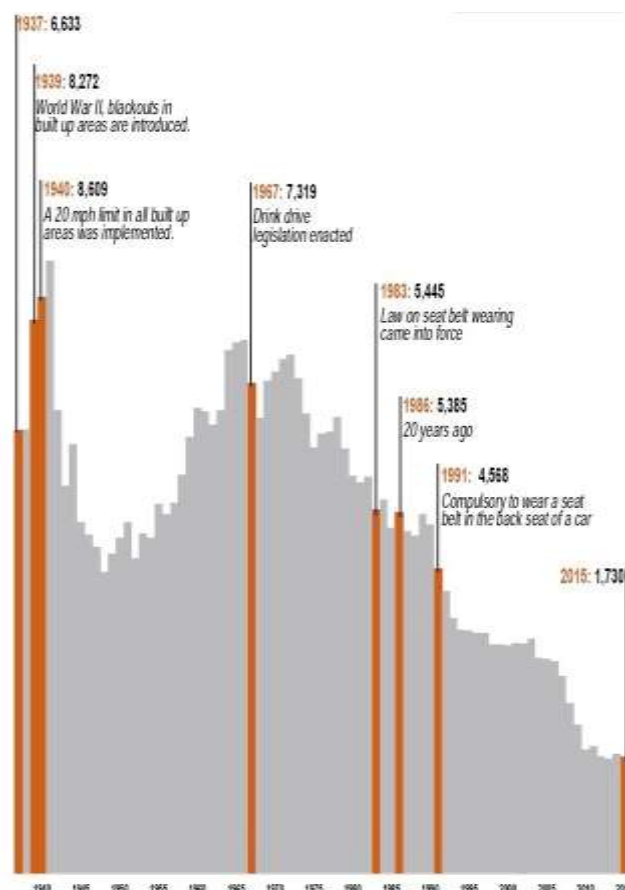
Therefore, road safety is independent of rapid motorization and expansion of road network provided safer roads are constructed.

III. UK- history of road fatalities

United Kingdom (UK) is a pioneer of road safety initiatives in world. There were 2.3 million motor vehicles in the year 1931 and 7000 persons killed in road accidents⁷. The Government had taken a serious view on fatalities and associated huge losses. As a result of high level political commitment, legislations, institutional arrangements, research, road fatalities reduced to 179213 amid 37.3 million vehicles^{7,8} in year 2016.

Fatality scenarios in United Kingdom (1937 to 2015)

A chart showing road fatalities during 1937 to 2015 in Great Britain is shown in Fig. 5 below. It may be noted that highest road fatalities 8609 were reported in 1940. Lowest fatality number 1730 was reported in 2015.



Source: Reproduced from 'Reported Road Casualties in Great Britain, Annual Report-2015, pp-50; https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/568484/rrcgb-2015.pdf

Fig 5: Fatalities and factors affecting road casualties in Great Britain-1937 to 2015

Change in laws and year of promulgation are also shown in Fig. 5. Enforcement of new laws made road users to change their attitude and traffic behavior that brought reduction in road fatalities.

United Kingdom-Declining trends in fatality (2000-2017)

Results of collective sincere efforts by road engineering, intense enforcement, post-crash response system and awareness campaigns have shown further decline in fatalities from year 2000 to 2017^{8,9,10,11} proves that road deaths could be reduced as shown in Fig. 6 below



Fig 6: Declining trends of road fatalities-2000 to 2017

The above Fig. 6 is based on data from four sources.

Source 1: [provides Excel sheet showing fatalities from 2000 to 2013.](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/463045/rrcgb2014-01.pdf)
<https://www.gov.uk/government/publications/annual-road-fatalities>

Source 2: [provides data for year 2014.](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/463045/rrcgb2014-01.pdf)
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/463045/rrcgb2014-01.pdf

Source 3: [provides data for year 2015.](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/568484/rrcgb-2015.pdf)
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Source 4: [provides data for year 2016 and 2017.](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/744077/reported-road-casualties-annual-report-2017.pdf)
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United Kingdom- Road fatalities can be independent of population- 1937 to 2015

The UK studies based on population data and road fatalities from 1937 to 2015⁹ shows (Fig. 7) that concerted multi-sector interventions can reduce fatalities despite continuous rise in population. There were no speed limits in UK till 1940 but majority of fatalities of pedestrians made the Government to amend law –a speed limit of 20mph in all built up area.



Fig 2.5: Road fatalities can be independent of rise in population in UK- 1937-2015

Thereafter, a series of legislations and effective implementation not only reversed the fatality trends but also made it independent of rise of population.

IV. Conclusions

Road safety issues and road fatalities are independent of motorization and rising population and expansion of road network. Safe system approach^{12,13} to road safety issues with shared responsibility of system providers, institutional arrangement are answers to reduce road fatalities. Road crashes, economic losses and health hazards are preventable.

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