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SAFE TRANSPORT- A CRUCIAL DIMENSION FOR SUSTAINABILITY OF SHIMLA

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Abstract:
A rapidly growing Himalayan city, Shimla's transport is developed on slopes of fragile hills in a highly seismic zone. Construction activities are restricted due to the limited availability of land, high construction costs, labour, and fragility of slopes. But in the Himalayas development is going on like any other region where such barriers do not occur. This paper is based on some data collected from police records, review of local newspapers and a household survey conducted by the researcher in 2010. An assessmentof safety measures in such a fragile topography for developing the transport system of Shimla is done in this paper to understand the safety of the citizens.

Keywords: *Sustainable transport, road safety, mixture effect.*

Introduction:

In the words of French President Jacques Chirac, 'Road safety is the major public health issue throughout the world'. In 1974, the World Health Assembly adopted Resolution WHA27.59, (cf. Peden *et al.* 2004) declaring road traffic accidents a major public health issue and calling for Member States to address the problem. In India, over 1.2 million people are injured seriously and about 300,000 persons are disabled permanently in road traffic crashes annually (Kopits and Cropper 2005 cf. Mahajan *et al.* 2013). One accident occurs every five minutes in India, with the accident rate corresponding to 45 per 100,000 persons (Parmod and Tiwari 2004).

The mixture effects meaning different types of vehicles using the same roads have also been considered a high potential risk, especially for non-motorized road users (Shefer and Rietveld 1997). A recent study on the NH-22 has identified the locations on this highway between Shimla and Solan which are the most accident-prone zones and evaluated thecauses of such accidents. The NH-22 stretch between Solan and Shimla witnesses a large number of accidents every year. The local police and National Highway Authority of India (NHAI) have demarcated it as one of the most accident-prone regions of Northern India (Ganguly *et al.* 2014). The study has assessed the materials used for road construction and the presence of porous surfaces which affect skid resistance and the speed of vehicles responsible for accidents. Some of the reasons they identified for accidents on this highwaywere narrow curves, overtaking on curves, insufficient SSD (Stopping Sight Distance) and OSD (Overtaking Sight Distance) on curves, heavy traffic at night, the distance between headlights, presence of fog, rainfall and snowfall and night time dependency on the headlight. The traffic volume was calculated in terms of Million Standards Axles (MSA). There is a substantial increase in the number of cars and motorcycles which can be attributed to the number of tourists visiting Shimla during the weekends. It is also observed that there is a sharp decrease in the number of commercial vehicles i.e., trucks and buses primarily due to holidays in schools and colleges on Sunday.

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Traffic	**Weekdays**			**Weekends**		
	Count	VDF	Traffic in MSA (10^{-6})	count	VDF	Traffic in MSA (10^{-6})
Cars	1112	1	1112	1317	1	1317
Two-wheelers (MC and scooter)	179	-	-	237	-	-
Buses	216	1	216	244	1	244
Trucks	356	4	1424	193	4	772
Tractors	1	4	4	0	4	0
Cycles	0	-	-	0	-	-
Others (JCB and Trailers)	1	3	3	0	3	0

Source: Vehicle fleet distribution at Shimla for weekdays and weekends (Ganguly *et al.* 2014: 252)

Another study on Shimla by (Dhillon *et al.* 2007) analysed the nature of the injury to the 50 cases brought to IGMC hospital of Shimla in one year i.e., from 1st January 2005 to 31st January 2005. Maximum injuries were due to heavy vehicles and on National Highway. The most vulnerable group is 21-40 years of age and males are more vulnerable ascompared to females.

A hospital-based descriptive study by (Mahajan *et al.* 2013) was conducted for a period of one year from 1st June 2005 to 31st May 2006 at Indira Gandhi Medical College hospital, Shimla. Cases were studied in the departments of Casualty, Orthopaedics, Surgery, Neurosurgery and Cardiothoracic Surgery. The study population comprised 401 consecutive cases of non-fatal injuries involved in road traffic crashes and reporting to Indira Gandhi Medical College hospital, Shimla during the study period. The results show that the maximum accidents are in young or productive age groups of 20-40 years. The accidents took place in the daytime, with more accidents of males than females, a maximum of employees followed by students and agriculturists. According to this study, the majority of people used light transport vehicles (27.9%) as the major mode of their travel, followed by pedestrians (20.7%) and cars (19.7%). It was also found that 33.4% of the victims were drivers themselves. More number of major injuries 116 (92.1%) had takenplace amongst the users of four-wheelers when they did not wear a seat belt at the time of the crash. In contrast, only 10 (7.9%) of the serious injuries were observed with the use ofa seat belt at the time of the crash. The chief cause of the crash cases was due to human error 328 (81.8%), of which over speed and overtaking accounted for 113 (28.2%) and 42 (10.5%) respectively. 31 (23.1%) of the drivers of different vehicles had consumed alcoholat the time of the crash. Other causes reported in the order of frequency were mechanical fault 39 (10.1%) and road conditions 34 (8.4%). Crashes due to Frost accounted for 15 (3.7%) of all the cases. The maximum number of crashes (55.1%) were reported to be due to skidding and/or rolling down, followed by side-impact (28.2%) and head-on collisions (16%). It may be due to the hilly topography of the state. Sideway impact as a major typeof crash was observed by Ganveer and Tiwari (2005 cf. Mahajan, 2013). The highestnumber of crashes (46%) were reported to have occurred at the curved level of the road, out of which skidding and/or rolling down and head-on collision types accounted for 58% and 47% respectively. More number of crashes on the curved level in this study could be

because of: hilly terrain and therefore the roads being zigzag, faulty engineering like the presence of sharp curves, poor adherence to traffic rules such as blowing of horns at blind curves and interplay of other environmental factors like; poor visibility at night and adverse weather conditions e.g., fog, which are fairly common in this part of the country. Nearly 20% of the crashes were reported during rainy and foggy conditions.

Unless the needs of non-motorized modes of traffic are met it will be almost impossible to design any sustainable transportation system for urban areas (Mohan and Tiwari, 1999). Pedestrians, bicyclists, and non-motorized rickshaws are the most critical elements in mixed traffic. If the infrastructure design does not meet the requirements of these elements all modes of transport operate in sub-optimal conditions.

The safety of children is of utmost importance but in the case of Shimla, the situation becomes clear when we go through some of the figures and headlines published by some local newspapers. As the *'Himalayan Kesari'* dated 24 August 2011 reports *'Hazaro kharchne ke bad bhi surakshit nai naunihal'* means that even after spending thousands of rupees on transportation costs the children are not safe. The charges are as high as Rs.1000 per month per student for a mere distance of 3-5 Km. The students, especially from private schools, mostly travel by taxis which is a cause for traffic snarls. The following table shows the situation of students, especially of private schools.

Table-Modes of Transport Used by School Children of Shimla

Name of Schools	Number of children	Vehicles by which they move
St. Thomas	500	Taxi, van, car
Tarahall	1750	Taxi, van, car
Edward	1900	Taxi, van, car
Dayanand	1750	Taxi, van, car
Shimla Public	680	School bus and taxi
DAV New Shimla	1750	Taxi, van, car
SD	1500	Government and private buses and on foot
TOTAL	9830	

Source: Himalayan Kesari Newspaper 2011

Children sit in a suffocating condition as reported by *'Shimla kesari'* of 13 Sept. 2011- *'Abhi bhi thoons thoons kar bhare ja rahe bache'* as instead of 7-10 seating capacity 20 students are made to sit in these vans though they are paying double the taxi fare.

The condition of buses is nonetheless different as reported by' *Himalaya kesari'* on 13 April 2012 in its heading '*Himachal ki bus hadso se sehme Pradesh wasi'* meaning the residents of the state of Himachal Pradesh are scared of bus accidents as there were 2816 road accidents in the year 2011 where 973 persons died. The highest among the deceased were from Shimla district where 400 road accidents took place and 134 people died.

Road accidents have increased in Shimla from 1980 to 2010 as shown in the graph. The figures remained constant at around 50 accidents per year till 1988 but suddenly jumped almost two times i.e., around 100 from 1988 till 1990. After that, it remained constant at around 150.

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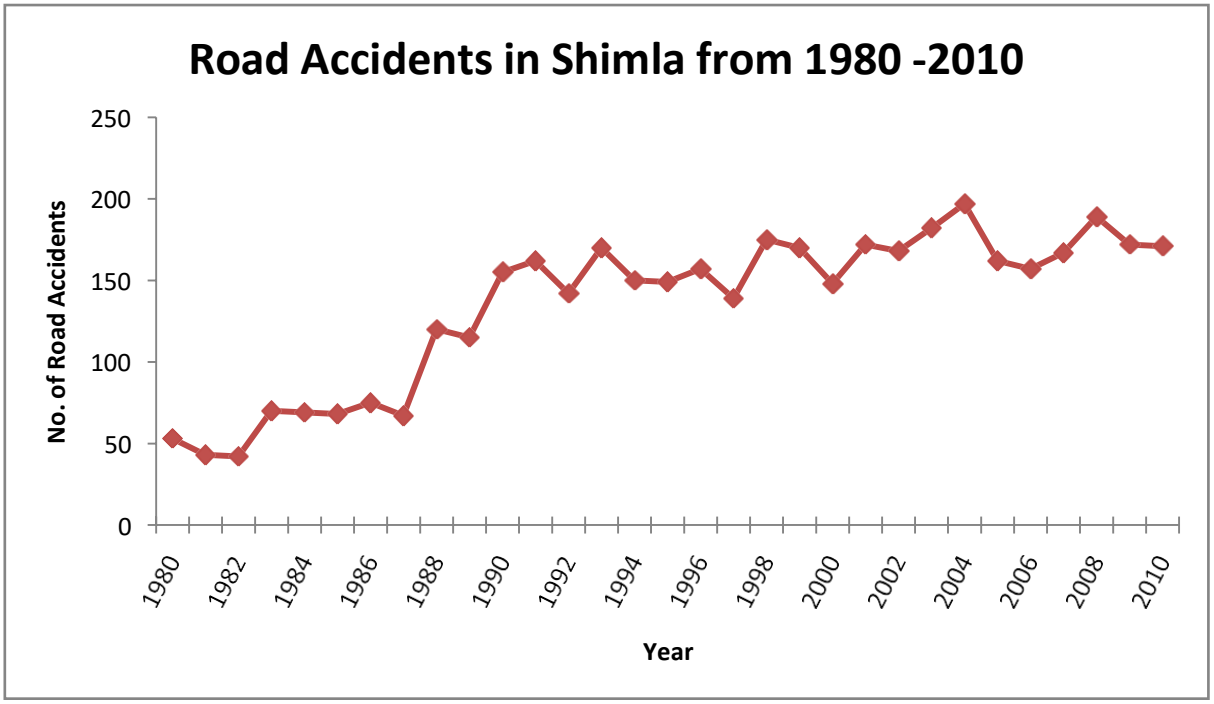
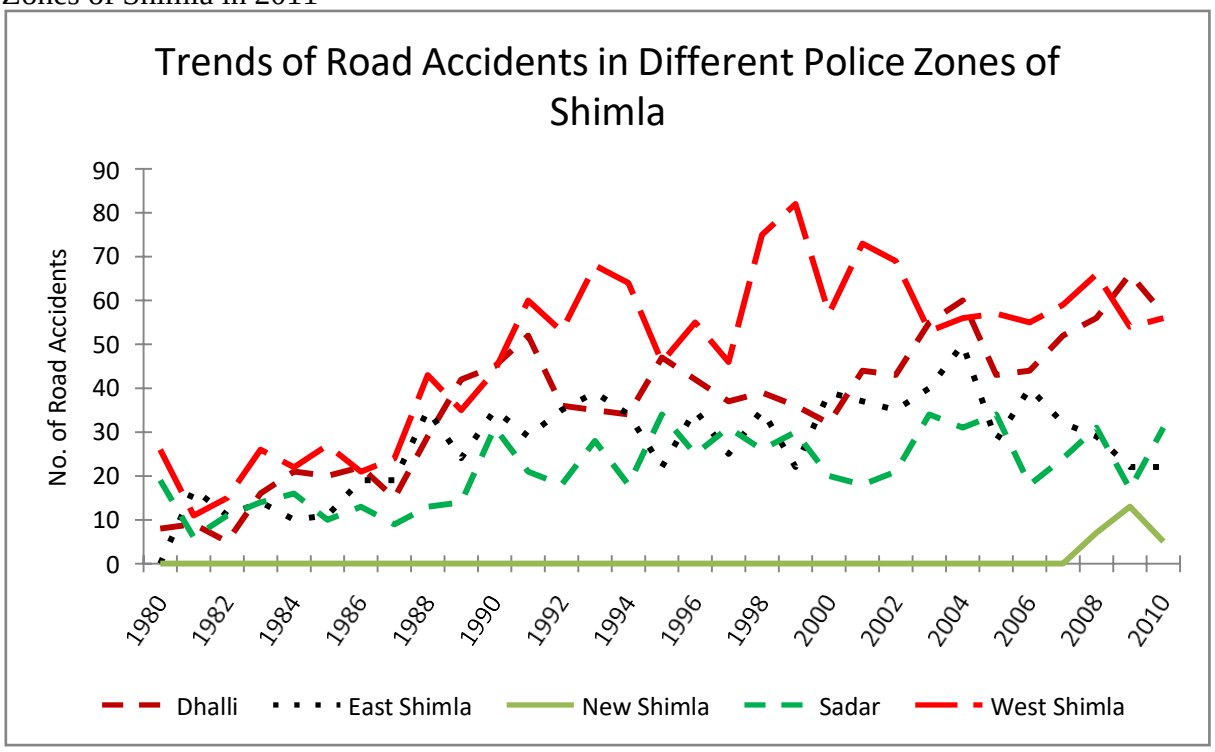


Source: Figures Calculated on the basis of Police Records collected for five Major Police Zones of Shimla in 2011



Source: Trends on the basis of Police Records collected for five Major Police Zones of Shimla in 2011

The trends in accidents reported in various police zones show that minimum accidents occurred in New Shimla from 1980 till 2007 but some started reporting after 2007. Maximum accidents were reported in the West Shimla zone which increased till 1999 but started decreasing after 1999. It is followed by the Dhalli zone which is on an increasing

trend. In East Shimla and Sadar police zones the occurrences of accidents range between 10-30 accidents per year. This shows that New Shimla is the safest zone while West Shimla and Dhalli are the most unsafe zones.

A household survey was conducted in the year 2010 by the researcher to know about the safety of citizens of Shimla who use local transport. The answers revealed that the residents of Shimla do not feel safe while moving on roads. Out of 400 households 74 families i.e., 18.5 percent had someone in their family met with a fatal accident. The vehicles involved in the accidents were cars, buses, two-wheelers, and others. Car accidents were more in the city as around 49 percent of the reported data (i.e., 74 households) had faced thesefollowed by buses i.e., around 30 percent, and two-wheelers around 14 percent. The nature of the injuries was serious as around 96 percent of those met with accidents had to be hospitalized.

Conclusions:

As road safety is important for sustainable transport all safety measures should be taken while planning for such type of transportation in hill areas. All engineering and technological aspects should be kept in mind while policy making. More use of good public transport can reduce the number of private vehicles on roads and thus increasesafety of citizens. Road curvatures, metalling and speeds should be regulated. Choosing a route that has better vertical and horizontal curvature can have both road safety andenvironmental benefits. Improved 'vertical curvature is estimated to lead to crash reductions of up to 52 percent and improved horizontal curvature will also have crash reduction benefits' (Ogden 1996 cf. Meers and Roth 2001). 'Improved vertical and horizontal curvature can lead to smoother speed profiles and thus lower fuel consumption' (Haworth and Symmons 2001: 29). Since Shimla receives regular rainfall and snowfall the material used for constructions and repairing of roads should be skid resistant. Streets should be well lit and fog lights should be fixed to avoid accidents. Narrow curves should be widened and traffic rules should be strictly enforced for the safety of citizens.

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