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VEHICLE CRASHES CAUSING ACCIDENTS IN DEVELOPING COUNTRIES USING EXAMPLE OF PAKISTAN DUE TO OVER SPEEDING, ISSUES, CHALLENGES AND STEPS TAKEN TO REDUCE ACCIDENTS ON ROADS

Muhammad Waqas

Abstract:

Speed is one of the major factors in contributing the vehicle crashes and major factor contributing to geometric design of highway which causes accidents leading to fatalities and injuries. This study covers the speed of vehicle as a major cause in vehicle crashes in Pakistan in kpk Peshawar. It observes the effectiveness of various speed control measures based on reports made by police of vehicles crashes in Pakistan and the work done in both in industrialized and developed countries. Pedestrians are the main victims of these accidents. The dominant causes of these vehicle crashes are the loss of control of vehicle from driver side and excessive vehicle speed. The speed factor is the main cause of these crashes and contributes to about 50 percent to accidents due to excessive speeding specially in case of young drivers. In developing countries by posting speed limits on road by traffic police department, it was not proved to be effective that much, speed humps, Rumble strips and increasing the Fine fee on highway and motorways due to over speeding above speed limits proved to be effective in decreasing over speeding. Also discouraging the cars schemes by different commercial banks and increasing import duty on cars, by introducing by an effective Transit Mass system in the form of bus or rail which discourage the private vehicle that causes congestion which ultimately leads to accidents and use of new technology should bring into account that separate high and low traffic on main roads and also there should be a public awareness seminars to be arranged by governing bodies on over speeding results.

Introduction:

More than 1.2 million people dies due to accidents on roads and Pakistan is sharing road death of 25781 fatalities per year. Estimated mortality rate per lack population in Pakistan is 14.2 (WHO 2015). The estimated cost of injuries and fatalities in Pakistan per year is 100 Billion Rupees for Pakistan. Data analysis exposed that, major causes of accidents were careless driving (55%), Pedestrians Involvements in it is (15%), vehicle engineering & mechanical issues (9%) and other factors (21%).

A traffic accident may be defined as “A rare, multi factor and random events which is always led by a situation in which one or more road users have failed to handle with environment”

The relation between the speed and road crashes of vehicle is directly related to each other, when the vehicular speed will high above the speed limit, there will be a great chance for accidents which will cause fatal and not fatal injuries and also damage to the property of people. The energy dissipated in accidents is directly proportional to the weight of vehicle and speed, it means higher the speed causes greater energy dissipation causing greater damage to during collision and more injuries and fatalities.

It has been established that if the mean speeds of vehicles can be reduced by 1km/hr then, on average, injury and crashes will be reduced by about 3%^{1,2}. More severe motor vehicle crash consequences (fatalities) will be reduced by a greater amount according to the “power laws” of Nilsson. Nilsson (1981) suggested that a change in mean speed is followed by a change in traffic crashes, injuries and fatalities according to the following formula:

$(V_2/V_1)^2$ for crashes, $(V_2/V_1)^3$ for injuries, and $(V_2/V_1)^4$ for persons killed, where V_1 is the mean speed before the change and V_2 is the mean speed after the change.

Also if a truck hit a child during accidents with speed of 30 miles per hour, the chance of survival is 50 % and if we the same is hit by truck with speed of 40 miles per hour, the survival chances reduces to 10 %,so it means greater the speed causes more risks to injuries for survival .

Aims and Objective:

The investigation of speed factors causing the road traffic crashes using example of Pakistan.

Materials and Methods:

The main source for the material was found from:

- 1) The work executed on speed control measures by the industrialized and developed countries and
- 2) Recent study undertaken in Pakistan in Peshawar kpk to evaluate the effectiveness of various measures taken by department using rumble strips, speed humps and increasing fine fee on highways and motorways.

The accidents reports from police department kpk Peshawar is gathered from 2013 to 2018 and is compared after the work done on speed control measured and effective measures taken by governing department.

Results:

Speed Control:

It is a traffic regulatory measure that aims to ensure the coordination between traffic vehicles and environment. In developed countries speed control is achieved by imposing speed limits and regulation of police enforcement strictly and give penalties due to over speeding and also by installation of speed reducing measures such as speed humps, Rumble strips, raised areas, narrowing the area of road in some places and other necessary measures.

Combination of imposing and speed limits is the best way to control speed of vehicles causing accidents, but in some developed it is practiced only with imposing speed limits which have very short term effect and then they have started also police enforcement for long term effects of it.so it is obvious that only speed limit imposing cannot reduce the speed of vehicles but also police enforcement is necessary to achieve the required level of results

Most drivers travel with speed more than speed limits on highway and motorway, they think that the speed limit given on highway say 50 mph is not enough speed and it feels very slow when you are going on motorway or highway so they demand 10 to 15 % extra than imposed speed limits so they over speed due to this also and as result the chances of accidents becomes high and some people due to awareness of accidents they don't risk their lives due to overs speeding and also police punishment and of being caught.

Situation of speed control in developing countries:

The reduction of speed in developing countries is very difficult and tedious job as the imposing of speed limits and law enforcement on it will not give too much good results because of some reason:

The developing countries have not that much resources provided to traffic police to keep a proper check on over speeded vehicles, also there is main problem of bribery and politics and there is also low level of public awareness regarding the reduction of speed. They cannot perform their duty properly because of the above reasons.

The public transport here in developing countries are not of that standards as required also there is a shortage of developing budget needed for safe and efficient transportation system to be developed for the users. People prefer instead of using public transport, they prefer their own vehicle for transportation.

Also there is a problem of teenage drivers which are under 18 and have not a driving license issued by the regulatory authority, they contribute to 60 percent accidents because of over speeding, drifting and racing the cars.

The victims of these accidents in developing countries are different when compared with developed countries. The victims are mostly pedestrians, cyclist and passengers of buses and wagons. Passengers are at greater risk when it comes to mixed traffics with free flow.

The fatal crashed of pedestrians is about 38 % in collision with cars or taxi and with buses and mini buses is about 32 % and remaining with heavy trucks. The percentage of fatalities in collision with high vehicle loaded trucks is very high because of its weight and momentum. From police department it is concluded that mostly it occurs due to errant vehicle means out of control vehicles from driver side and also due to over speeding of these vehicles.

For passengers the buses and trucks due to over speeding and overloading, there is very low chance for survival. The passengers carrying by buses have no proper seat belts provision and no safety things.

In order to reduce crashes and provide safety to people, there should be proper police check on the different hidden spots in order to do the confidential check on these over speeding vehicles and proper cameras should be installed at proper locations.

By implementing expensive strategies it is also convenient to use other strategies such as physical restraints e.g. using rumble strips in specific areas and speed humps. It is found that 30 % percent road crashes are reduced due to this and about 50 % fatalities after implementing this. The rumble strip are 1 inch in thickness and 1.5 feet wide and laid across highway to a distance of about 800 m in specific areas.it is proved economical and effective than other strategies.

The political support for road traffic injuries prevention and control is poor. The provision of extra lane for cyclist and motor cyclist Passenger Bridge is missed by authorities as they feel it will increase budget of project as they don't feel much for people safety.

The public awareness on rules and regulation of traffic is missing, proper training is necessary for drivers before they get license from transport department.

In developing countries most of roads are designed and built to allow different types of vehicle on same place and same time, it is given a choice to use road which part you want to use which leads to serious risk and accidents. In Pakistan there is trend to build a road which will use by every one without dedicated lanes to cyclist and motorcyclist and pedestrians.

The problem of speeding is not a matter for the police alone. Involvement of civil society is essential in the creation of awareness on the importance of speed control in reducing road traffic crashes, injuries and fatalities in developing countries.

Year	Total no of accidents	Accidents		persons		Vehicles involved
		Fatal	Non-fatal	Killed	injured	
2013-2014	8359	3500	4859	4348	9777	9423
2014-2015	7865	3214	4651	3954	9601	8949
2015-2016	7050	2009	5041	1700	3050	8050
2016-2017	4550	1500	3050	850	2600	5500
2017-2018	700	300	400	250	600	890

Table 1 Traffic accidents Data of Peshawar kpk

As we can see that accidents rate from 2015 onward is decreasing by taking various measures taken by the police enforcement of law and order and also by using other physical restrained measures such as Rumble strips and speed humps etc.

Conclusions:

The speed control in developing countries is the main factor contributing to traffic crashes causing fatalities and injuries, so the roads are designed with proper planning and designing and established the geometries of roads and posting speed limits on road which becomes acceptable to all drivers.

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