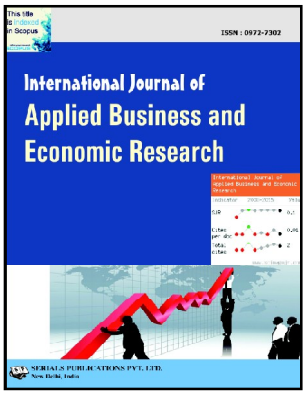

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Analysis of Accidents Caused by Vehicle Defects – with Specific Reference to Buses of Chennai Metropolitan Area

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Abstract: Road traffic accident (RTA), a cause of unnatural death is the third major avoidable one amongst all deaths. Road deaths in India are publicly manifest, while road safety is professionally lacking and politically missing. Road accidents mainly due to bus accidents are the major cause of lose of many number of human life. This study emphasis on the causing of bus accidents due to vehicle defects in buses. This paper concentrates on the general causes of bus accidents, accidents caused due to vehicle defects of buses. The suggestions to avoid bus accidents are also given. The study was conducted through primary data, in which questionnaire was collected from 50 respondents from Chennai. Hypothesis were also set and answers were derived.

Keywords: bus accidents, vehicle defects, factors

INTRODUCTION

Transport plays an important role in the economic development of any constituency. Economic growth that result in higher earnings and a rising living standards are expected to create greater difficulties for travel for both work and non-work/leisure commitments. This is in turn can create overcrowding and dependability problems on the transport network, increasing costs on business and damaging quality of life. As road transport provides close connection and flexible movement of goods and passengers, its support by people are on the one way rise day by day. The quality of life of the people now greatly depends on the excellence of roads. In both developed and developing countries road accidents are one of the major causes of death, injury and disability in all over the world. With a broad evaluation, in every one minute, two people are killed and 95 people are severely injured or permanently disabled in traffic accidents internationally. Traffic accident related deaths and injuries result in not only extensive economic losses but also serious physical and mental sorrows. Developing countries are much more pretentious from traffic than developed countries.

According to the World Health Organization (WHO) statistics, 75 Per cent of deaths resulted from traffic accidents happening in developing countries, although they own only 32 Per cent of the motor vehicles in the world. While the annual accident per 10,000 vehicles ranges from 20 to 200 in low or middle income countries, it varies between 1.5 and 5 inmanufacturing countries. The projected 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 cracksarise on all continents and in every country of the world. Every year they take the lives of more than a million people and weaken many millions more. Pedestrians, users of non-mechanical vehicles–including bicycles, rickshaws, carts and motor cyclists in low–income and middle–income countries carry a large percentage of the global problem of road traffic death and serious injury. India's record in road deaths has risen to at least 14 deaths per hour in 2014 against 13 the previous year. The total annual loss of life due to road accidents have crossed 1.18 lakhs, according to the latest report of National Crime Records Bureau (NCRB). While trucks/lorries and two-wheelers were accountable for over 40 Per cent deaths, the rush during afternoon and evening hours were the most mortal phases.

Among the road accidents, bus accident is more severe as it is one of the major public transport. It carries large amount of people at a time and the severity of death and injury also more when compare to other vehicle accidents. Bus safety is a major concern in developing countries where bus transport undertakes a noticeable role in assuring sufficient and reasonable accessibility to the vast majority of the population while encouraging urban and rural development. High accident rates for buses with respect to other vehicle types have been noticed in India, Nepal, Tanzania, and Zimbabwe, Pakistan, Chile, Sri Lanka and Bangladesh.

REVIEW OF LITERATURE

1. Aghonkshese, *et al.,* (2013) argued that vehicle factor is also one of the cause for bus accident in Nigeria. He has given certain vehicle factors like vehicle design, vehicle brake system, vehicle body and tyres, vehicle lights, vehicle engines and vehicle maintenance is also some of the factors for causing bus accidents in Nigeria. He also gave some of the suggestions like proper maintenance of buses, abuses of alcohol during driving by bus drivers, restriction on maximum driving time for drivers and so on.

2. Duong Thi Mai HOA, *et al.,* (2013), throws light on the steps to taken against bus accidents. Some of them are proper maintenance of vehicles, appointed of experienced bus drivers, fixing of maximum time of driving. He also argued that there are two obstacles in adoption of these prevention measures. One is the lack of database and another one is the use of proper and effective measures against bus accidents.

3. Manoj Mohanan (2013) viewed the bus accident is critical and different aspect. He analysed that the bus driver who committed accident before one year, when they are driving in the same route even after one year, the effect of accident shock affect them and it may also lead to accident again in the same place. But the cause is because of health and mental shock of accident that occurred earlier.

4. Anders E. af Wåhlberg (2007) emphasized the celebration of bus drivers also one of the main cause of bus accident in Sweden. The bus drivers changing the speed limit at different times leads to lose control by bus drivers and causing bus accidents. Installation of bus speed limit is the best solution for this problems. But it can be successful only through the cooperation of bus drivers.

5. In a Road Safety Report of US (2013) has brought into light that many accidents are occurring between trucks and buses. As trucks are more weighted vehicle and bus are carrying more of people, the loss of life is more for people and causing more number of injuries. This death of people is due to unwanted reason of accident. The accident between other vehicles were low when compared to these kinds of accidents.
6. Maunder and Pearce (1998) suggested through their study that there is need for multidisciplinary accident investigation units. Providing of incentives to bus drivers for accident free driving will encourage them to drive well. Government can also bring some schemes for the driver employees. Adequate off-road parking should be provided.

CAUSES OF BUS ACCIDENTS IN INDIA

1. Distracted Driving

The number one cause of bus accidents is not a criminal that drove drunk, speed or ran a red light. Diverted drivers are the top cause of bus accidents. A distracted driver is a motorist that averts his attention from the road, usually to talk on a cell phone, send a text message or eat food.

2. Speeding

Many drivers ignore the speed limit and drive 10, 20 and sometimes 30 mph over the limit. Speed kills, and traveling above the speed boundary is an easy way to cause a bus accident. The faster you drive, the slower your reaction time will be if you need to avoid an auto accident.

3. Drunk Driving

When you drink, you lose the skill to focus and function properly and its very dangerous when driving the bus. Driving under the impact of alcohol causes bus accidents every day, even when they are on the top causes that can be avoided.

4. Uncontrolled Driving

If the driver don't drive carefully, it may end up in a needless bus accident. That's what often happens to reckless drivers who speed, change lanes too quickly or pursue before causing a bus accident. Reckless drivers are often intolerant in traffic so be sure to take extra care around aggressive drivers.

5. Rain

If the weather gets bad so like the roads.Bus accidents happen very often in the rain because water creates slippery and dangerous surfaces for buses and often causes automobiles to spin out of control or slip while braking. To avoid bus accident, extra care is needed by the drivers during the time of rain.

6. Running Red Lights

When driver driving the bus, red means stop and not doing so usually leads to bus accidents. Drivers that run red lights, run the risk of causing illegal death because they often cause side-impact smashes at high speeds. To avoid bus accident, look both ways for oncoming buses as by approaching a green light.

7. Running Stop Signs

Stop signs should never be ignored by the bus drivers, but ignoring leads to bus accidents. Each year, thousands of bus accidents occur because of drivers ran out of stop sign. Many rollover accidents and side-impact bus accidents result from drivers that run stop signs.

8. Night Driving

Driving in the daylight can be hazardous, but driving at night nearly doubles the risk of a bus accident occurring. As the sun goes down, the awareness of the road of the bus drivers must increase, losing it leads to the losing of many lives.

9. Design Defects

No product is ever made perfectly, and buses are no different. Automobiles have hundreds of parts, and any of those defective parts can cause a serious bus accident. Many automakers have problems with design defects in the past.

10. Improper Turns

The reason that we have stop lights, turn signals, and lanes designated for moving either right or left as opposed to straight is because when drivers ignore the rules of the road, bus accidents are often the result. To prevent bus accident, always look for signs and obey the proper right-of-way before you make a turn.

11. Tailgating

Many drivers are impatient and irresponsible, driving so close to another bus or vehicles that they cannot react in time if the bus in front of them brakes suddenly. Many fatal car accidents have occurred when buses dangerously tailgated another driver at high speeds.

12. Driving Under the Influence of Drugs

It's not only alcohol that is dangerous when mixed with drivers on the road. Drugs, both legal and illegal, can impair ability of the bus driver to fully function as a driver.

Influence of bus design and defects in bus accidents

Active safety characteristics of a bus include of drivers which in its turn depends on the working performance particularities of a bus (braking, engine conditions of drivers. power, speed, stability, controllability, informativity, The Influence of Active Safety Characteristics of a Bus driver's working place (cabin microclimate, noise, on Driver Working Conditions vibration, ergonomic features). Working place' parameters Factors Influencing Driver Reliability: Driver's reliability influence directly psycho-physiological state of a driver. More vibrations in bus also cause bus accidents. Durable impact of vibrations causes tiredness, headache. Combined with noise, negative impact of vibrations on a human organism significantly increases.

Driver's seat is a good vibration absorber provided that is relatively hard, doesn't have springs and correlates well with anatomic particularities of a human body. Comfortable driver's seat, ergonomic location of devices and a control board are the most important factor of safety driving.

OBJECTIVES

1) To identify whether vehicle defect of the buses is one of the major cause for bus accidents in Chennai.

3) To suggest measures to reduce bus accidents due to vehicle defects.

HYPOTHESIS

Ho: There is no association between the experience of bus drivers and vehicle defects of buses.

H1: There is an association between the experience of bus drivers and vehicle defects of buses

METHODOLOGY

For the present study, primary and secondary data were used. Secondary data collected from various books, journals included in the reference section. Primary data were collected through well-developed questionnaire. The factor analysis is used as statistical tools for analyzing the data and testing of hypothesis.

Factor analysis performed

Factor 1 (accidents occur due to break failure, EV= 6.121187 and CA= 0.9035)·

Factor 2 (accidents occur due to vehicle defect, EV=1.37890 and CA= 0.8719)·

Factor 3 (accidents occur due to bursting of tyres, EV=11.5118 and CA=0.9555)·

Factor 4 (accidents occur due to poor maintenance of vehicles, EV=2.27512 and CA=0.9182)·

Factor 5 (accidents occur due to steering lock, EV=1.32201 and CA=0.9509)·

Factor 6 (accidents due to old buses, EV=1.17201 and CA=0.9014).

From the 50 respondents, 5-point Likert scale, the derived factor delivered an excellent Cronbach Alpha result. A value of 0.9555 was obtained for all the variables used. This factor was named, accidents occurred due to bursting of tyres. Factor analysis was performed on the second set of variables in the research questionnaire a value of 0.9509 was obtained for all the variables used. The the second factor, was named occurrence of accidents due to steering locks, the third factor, was named occurrence due to poor maintenance of buses and the fourth factor was named due to break failure, the fifth factor is old buses causing bus accidents.

SUGGESTIONS

Suggestions need to improve bus driver behaviour are listed below.

- It is clear however that drivers need to be better educated and trained when initially learning to drive but in particular about the clearing the defects of buses.
- They should be taught technical, social and psychological skills to be a safe, accountable professional driver.
- Bus drivers should contribute in refresher driver training courses so that bad habits can be removed rapidly.
- Owners should provide monetary incentives for drivers who have been 'accident free' during the previous 12-month period.

- Medical and health checks need to be provided as long as regularly for all but especially ageing drivers.
- Drivers should be encouraged to work within existing legal maximum hours.

CONCLUSION

Owners and operators need to be refreshed to preserve their vehicles to a much higher standard than at present. Preventative maintenance can improve enactment and efficiency and extend the operational life of the vehicle. A safe, smart vehicle is also more likely to attract passengers than an unsafe and poorly maintained vehicle and also passengers might be encouraged to afford a slightly higher fare for such a vehicle/service. Owners and operators also need to understand that regular vehicle maintenance is a cost effective business practice which can minimise vehicle downtime and costly, time consuming breakdowns whilst in service.

The liberalisation is being measured in respect of the provision of public transport services, enforcement of existing (and new) legislation in terms of vehicle condition, numbers allowed to operate etc., are needs to be strict. Operative regulations and actions must also be implemented severely to ensure that safe and effective service provision prevails for the benefit of passengers and all road users.

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