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NEW TECHNOLOGY IN THE ROAD CONSTRUCTION AND TRANSPORT

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Abstract: Traffic is also a problem in all the major cities of India. Traffic not only is the major source of Air pollution, sound pollution but also cause of several deaths in the road accidents. Road network is one of the vastest network of the India transportation system. So, the solution of traffic does not always lie in choosing the other means of the transportation system like Railway, Airway etc... , something is to be done to reduce the traffic on road so that we can use these roads more effectively and efficiently. The solution lie in making use of the future concept of road transport system, which not only reduce the traffic on roads but also will help in reducing the pollution of all type. In our thesis we will discuss the modern and future technologies and the cost-benefit analysis of these technologies and how they can be and where they can be implemented in our city i.e. Jaipur.
Keyword: Road Transport, Saddle Bus, Human Transport System.

I. INTRODUCTION

From the information gotten from the traffic police, it demonstrates that Jaipur's quick urbanization has wound up in expanded road accidents in the city. For example, in 2014, 98 accidents were enrolled on Tonk Road (from Tonk Phatak to India Gate, Sitapura). These 98 accidents brought about 35 passings and 85 wounds. The greater part of the accidents happens in night or amid early morning hours. The general mishap figures demonstrate the repulsive state of Jaipur's roads. Aside from speeding drivers or failing vehicles, an inside and out review is required to know alternate reasons for these accidents. In Jaipur city people on foot and cyclists are to a great degree helpless against accidents as they are presented to speeding vehicles on either side of the road. The vehicular speeds are too high to enable safe section to people on foot. One fundamental issue is that such road clients are not offered any agreeable and safe intersection choices. Indeed, even the general situation of road wellbeing measures being trailed by town designers in different urban areas is defective in Jaipur. The drivers don't regard the privilege of people on foot on zebra crossings. Added to this, busses don't stop on stamped bus stops. At times the private vehicles are looked at for speeding yet implementation is frail. In Jaipur, drivers are generally rebuked for the accidents, while the road development authorities stay covered up in the whole procedure of mishap examination. There is a dire need to introduce CCTVs and support frameworks with satisfactory traffic police at busy intersections to pull up violators for streamlining the traffic stream. Then again, checking the clumsy locales is required to be done through traffic quieting methodologies to break the speed of vehicles. To forestall road accidents in Jaipur, there is a requirement for speed breakers as prescribed by the Indian Road Congress. Furthermore, the zebra crossings must be fortified at six crossings in the Pink City in any case. Such activities are cheap and simple to fabricate, yet city designers are not inspired by doing such ease undertakings as there are no 'motivations'. No significant city in India can claim to have mishap verification roads. Be that as it may, in any event Jaipur can think and make the empowering condition to arrest the expansion in fatalities and accidents.

Figure 1: Traffic Situation in India

The studies of Banerjee K.K.[8] (81.80% victims of thoraco-abdominal injuries were males and 40% were in the age group of 21-30 years) and Singh et al [9] from Chandigarh reported 91.09% cases were males and 54.50% cases were in the age group of 21-40 years.

Educational status of victims of road traffic accidents: study of Rahman et al [10] where 67% victims were educated and 28% were uneducated and 5% were unknown. The explanation for this might be due to that our study was conducted in city where literacy rate is better than rural population.

Religious distribution of victims of road traffic accidents: - The substantial high rate of incidences in Sikhs may be because of that our study was carried out in state where Sikh population is more as shown in table 1.3.

Type of victims involved in road traffic accidents:- Study as shown in table 1.2 where pedestrians comprise maximum number amongst RTA fatalities, of them a significant number are from garment industry. They come from distant

areas or even from other states where they have got a very little knowledge of traffic rules. The reasons associated with high involvement of pedestrian could be due to congested roads and encroachment of the roads by the shopkeepers resulting in scarcity of space for walking. In our country, although pedestrians being the commonest road users, but still there is no separate lane / footpath for them.

The cause of death of the victims of road traffic accidents in present study as shown in table 5, is comparable to study done by Tirpude et al [11] who also reported head injury was the commonest injury (65.50%) among the RTA as head is the toughest part which bears maximum impact.

Age in years	Males (% age)	Females (% age)
0-10 years	5	-
11-20 years	10	-
21-30 years	10	-
31-40 years	15	15
41-50 years	30	5
Above 50 years	10	-
Total	80	20

Table No 1 Showing Age And Sex Wise Distribution Of Cases

Educational status of victims	Males (% age)	Females (% age)
Educated	70	15
Non Educated	10	5
Total	80	20

Table No2 Showing Education And Sex Wise Distribution Of Cases

Religion of victims	Males (% age)	Females (% age)
Hindu	25	5
Sikh	40	10
Christian	10	5
Muslim	5	-
Total	80	20

Table No 3 Showing Religion And Sex Wise Distribution Of Cases

II. RELATED STUDY

M Saeed Asadi Bagloee Madjid Tavana Email author Mohsen Asadi Tracey Oliver [1] ,This study investigates the challenges and opportunities pertaining to transportation policies that may arise as a result of emerging autonomous vehicle (AV) technologies. AV technologies can decrease the transportation cost and increase accessibility to low-income households and persons with mobility issues. This emerging technology also has far-reaching applications and implications beyond all current expectations. This paper provides a comprehensive review of the relevant literature and explores a broad spectrum of issues from safety to machine ethics. An indispensable part of a prospective AV development is communication over cars and infrastructure (connected vehicles).

Liang YeEmail authorYing HuiDongyuan Yang[2] The article intends to find a method to quantify traffic congestion's impacts on travelers to help transportation planners and policy decision makers well understand congestion situations. Three new congestion indicators, including transportation environment satisfaction (TES), travel time satisfaction (TTS), and traffic congestion frequency and feeling (TCFF), are defined to estimate urban traffic congestion based on travelers' feelings.

Bin Ran, Peter J. Jin , David Boyce , Tony Z. Qiu & Yang Cheng [3] In this paper, we attempt to summarize the impact of technologies, especially intelligent transportation system (ITS) technologies, on transportation research during the last several decades and provide perspectives on how future transportation research may be affected by the availability and development of new ITS technologies. The intended audience of the paper includes young transportation researchers and professionals. Current transportation models are divided into "generations" based on their technological and practical background.

Ryuichi YOSHIMOTO Toshinori NEMOTO [4] Surveying the recent trend toward e-commerce and computerization in the trucking industry, this paper establishes a framework for analyzing the impact of information and communication technology on road freight transportation in terms of commerce, logistics and fleet management, and proposes hypothetical mechanisms of influence. The authors note that the rapid growth of e-commerce and freight fleet management systems make it difficult to arrive at firm, statistics-based conclusions about their impact on road freight transportation, but suggest that more sophisticated government management of transportation demand as well as freight fleet management systems could cancel out the negative impact of e-commerce on road transportation.

Thijs Habets, Hans Voordijk and Peter van der Sijde [5] this research examines how the construction industry adopts alternative transport technologies. This paper presents the general characteristics of the adopter and what his perceptions are towards innovative transport technologies. The study focused on four rates of innovation, related to alternative transport technologies. The results show that 83% of the respondents choose innovation over no innovation; more than half of the respondents choose an innovation that can be characterized as "architectural".

III. PROPOSED METHODOLOGY

In order to accomplish the proposed research objectives, the following approach will be followed:

We have chosen the following concepts are too studied in details.

A. Straddle Bus

Population-burdened transit systems may have a new and cheap solution in the form of a bus that glides two meters above the street up to 37 miles per hour (60 kilometers), on a set of rails. Think of a trolley car shaped like an arch. A prototype of this so-called straddle bus or "land-air bus". The idea is to build on top of existing traffic patterns rather than having to dig costly subway systems. Because it relies on more existing infrastructure than a subway, this design is expected to cost just 60 percent of what subways would, and

save on the carbon emissions that would result from an equivalent number of cars or regular buses.

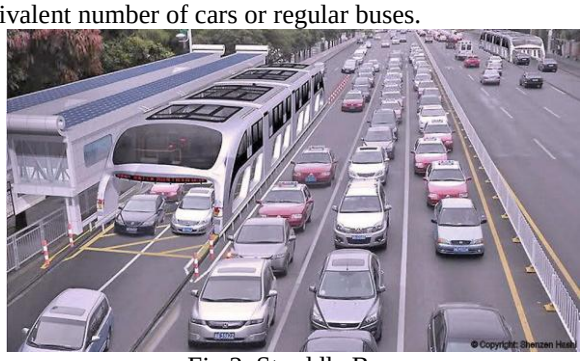

Fig 2. Straddle Bus

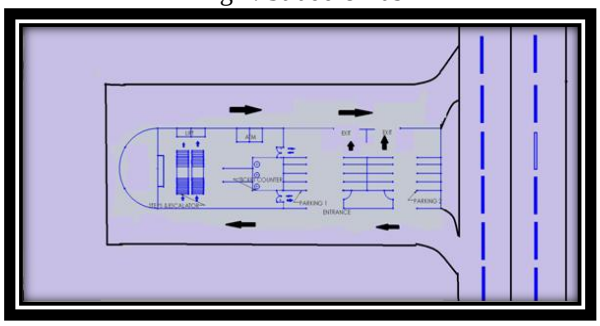

Fig 3. Straddle Bus station Plan

B. Human-Powered Public Transportation

Fig 4. Human Power Transport

The Shweeb is the world's first human-powered monorail. One to four people can use the Shweeb and it uses about half of the energy required to ride a racing bike, or about 1/3 of the energy required to ride a mountain bike. The Shweeb is enclosed – thus shielding the rider from poor weather conditions – and they say it is as comfortable as lying in a hammock.? The Shweeb creates an array of potential opportunities for the future. In the short term, the Shweeb could provide an alternative to shuttling around large amusement parks – for example Disney World. In the longer term, the Shweeb could provide an alternative to underground subway lines for commuters. The first city to adopt such a system would surely benefit from the publicity.

C. Electric vehicles (EVs)

Electric vehicles (EVs) are primarily an auto-centric, engineering approach to the problem, whereby automakers have substituted the internal combustion engine with battery powered electric motors. This dramatically increases the fuel economy of the vehicle and eliminates tailpipe emissions. The rise of Tesla Motors and their commitment to create luxury electric sports cars has created positive momentum for EVs. Now nearly every major automaker in the world has an EV in the production pipeline. The development of new Lithium-ion battery technologies with much higher energy and power density has also made EVs more competitive. Eventually, EVs will be designed specifically around new electric drivetrains such as in-wheel electric hub motors, which eliminate the need for transmissions and gearboxes, further improving both driving and environmental performance.

D. Zipcar

The world's largest car sharing program, Zipcar, based in Cambridge, near Boston, has taken a business-model approach, allowing users to rent vehicles by the hour. Users have the benefit of access to mobility whenever they need it, without the burdens of car ownership such as car depreciation, parking, insurance, tolls, and maintenance. This is only the start. In 2012, the Transportation Sustainability Research Center at UC Berkeley reported an estimated 1.7 million car-sharing members existed in 27 countries. Car sharing has obvious benefits to the city. Zipcar estimates every shared vehicle replaces up to 20 private automobiles, thus reducing total vehicle miles and land devoted to parking. Even carmakers – such as BMW, Daimler and Ford - are getting into the action with their own programmes.

E. Driver free

Autonomous automobiles are no longer science fiction, thanks to the initial funding efforts by the US government's Defense Advanced Research Projects Agency (Darpa). Tests have shown that the concept will work on real-life roads. The Urban Challenge in 2007 shifted the focus of this research to the complexities of city driving. Six teams out of 11 semifinalists finished that race, therefore validating the technology. Since then, automakers such as GM, Audi, Toyota, and others have invested the concept. The Google Driverless Car has already logged 300,000 miles on California roads without a human driver. After lobbying by Google, the states of California, Nevada, and Florida now allow driverless cars.

The development of autonomous vehicles has other benefits too. Every year some 1.25 million people around the world die every year from automobile accidents. Autonomous vehicles can use car-to-car communication to avoid accidents and will always follow the road rules. Cars could be made out of lighter materials for collision-free environment to make them much more energy efficient. Autonomous vehicles can also closely follow each other, in platoon fashion, improving synchronization with traffic signals to avoid stop and start delays. Estimates by some leading experts state that traffic flow could improve by as much as 40-50% just by using driverless technology. That means less idling at the traffic lights, and less pollution. The increased use of low-energy transportation options such as bicycle sharing, bus rapid transit and traditional subways are providing city dwellers with more flexible, cheaper, and less polluting options. For instance, China will be building over 87 new mass transit rail lines of nearly 2,500km (1,550 miles) of length in the next five years alone. If construction

continues on this pace, then China's cities will have half of the world's metro tracks by 2050. Some novel mass transit concepts have also emerged, such as on-demand buses developed by the University of Tokyo, which replace fixed-route bus lines, by dynamically routing pick-ups and drop-offs based on user demand. These systems improve operational efficiency and reduce carbon emissions by eliminating unnecessary stops. Another new concept that has yet-to-be-proven is the 3D Express Coach, an elevated bus, which straddles over two lanes and hovers over automobile traffic.

IV. CONCLUSION

This research has shown the potentials of implementation of modern technology not only solves the problem of traffic but also reduce all kinds of the pollution. The findings indicate that a transport system which is eco-friendly and cheap and has universal design access plan should be incorporated rather than high transport system facilities and so the straddle bus,shweeb, etc.. technology proved ideal replacement for the metro rail projects. The Technological and economic feasibility made it evidently clear that it is best suitable , but the main disadvantage of this technology is , it is accident prone to reduce these risks the commuters must have awareness programs and let them know about the technology and how to mingle with it. Apart from this the bus has been advantageous in every aspect. Our future work in have more depth workout on the modern transportation system and will work on make this system better and efficient.

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