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Esteemed Author

Please accept my heartiest felicitations on very kindly sending your valuable article/research paper titled 'ROAD SAFETY LAWS FOR A SUSTAINABLE SMART CITY' for publication in Volume No. 8 (2018), Issue No. 02 (February).

Our editorial board has highly appreciated your invaluable piece of research. The researchers and the academics have conveyed their views and its worth have been appreciated by one and all.

With sincerest regards and profuse thanks for your contribution.

Sincerely Yours

Authorised Signatory

I. J. R. C. M.

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Abstract

A healthy, safe, accessible and sustainable public transportation system acts as a lifeline of the city. It is one of the pillars on which the economical growth of that area depends and flourishes in the time to come. But the scenario prevailing in developing countries including India and the researches reveals that the condition of public transport is not as per the requirements of the cities. No doubt that we might come across certain exceptions to the clause.

With the rapid growth various cities have turned into the business hub of the country including Mumbai, Delhi, Vishakhapattanam and Kolkata. In contrast to the set economic growth the benchmarks of public transportation system, traffic management and parking systems have not evolved at par. Be it lack of awareness, unwillingness to frame the policies or non implementation of the existing laws or extreme pressure from private & political domain, the phenomena is harming the citizens of the country. The time has come to emphatically raise the issue for the need of a planned and effective public transportation system for the masses.

Present Scenario in India

The trend of public transport is quite different as compared to the high income group countries. Be it lack of proper transport resources, mismanagement or any other reason, the general public here prefers to travel in their own vehicles. Still, more than 60% percent of the Indian population resides in the rural areas and the most of the rural population travels into the urban area for employment. As a result the urban areas has to suffer problems like

- Traffic Congestion
- Air and Noise Pollution
- Road Crashes
- Inefficient Enforcement

Take an example of the India’s national capital New Delhi. Earlier travelling in DTC buses was the only medium of public transport available in the city. Later
Delhi Metro was introduced that levitated the burden and helped in controlling congestion on road. After several years of launch of Metro the condition of Delhi’s traffic is still getting worsened day by day.

The Metro runs stuffed during the peak hours and in addition to the Metro the roads of Delhi mostly experiences traffic jam almost each and every day. With the over increasing population of private vehicles the level of pollution has risen dramatically. Delhi now known as one of the most polluted cities in India. Commuters in the city mostly use their own vehicles for transit. The scenario itself proves that to curb the situation the two things are required to be done on priority basis:

- Expansion of public transport services
- Motivate people reduce using personal vehicle for solo transit

According to the present vehicle population in India, the present manpower available in the country could not enforce more than five percent vehicle in a day, which is almost near to negligible.

In 2016, fifty million plus cities accounted for a share of 18.7 percent in total road accidents in the country, 11.8 per cent in total persons killed in road accidents and 16.7 per cent in total persons injured in road accidents. Chennai had the highest number of road accidents (7486) while Delhi had the highest number of deaths (1591) due to road accidents. Accident severity in terms of percentage share of 50 million cities was 19.8 per cent in 2016 against 14.9 per cent in 2016.

### Accidents & Deaths in India – 2016

<table>
<thead>
<tr>
<th></th>
<th>Urban</th>
<th>Rural</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accident</td>
<td>2,16,813</td>
<td>2,63,839</td>
<td>4,80,652</td>
</tr>
<tr>
<td>Killed</td>
<td>57,840 (38.4%)</td>
<td>92,945 (61.6%)</td>
<td>1,50,785</td>
</tr>
</tbody>
</table>

### Road Traffic Death and Injuries – A Major Threat for India

Details indicating the total number of accidents, persons killed and injured with accident severity in the 50 Million plus cities is illustrated. Out of these fifty Million plus Cities Chennai reported the highest number of road accidents (7486) during 2016 followed by Delhi (7375). Delhi reported highest number of road accident deaths (1591) followed by Chennai (1183). Cities with highest reported accidents depicted in the following:

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¹ Road Accidents in India – 2016, Ministry of Road Transport & Highways, New Delhi
Table: Number of Fatal Accidents & Deaths in Major Cities

<table>
<thead>
<tr>
<th>S.R.</th>
<th>City</th>
<th>Total Accident</th>
<th>Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Chennai</td>
<td>7486</td>
<td>1183</td>
</tr>
<tr>
<td>2</td>
<td>Delhi</td>
<td>7375</td>
<td>1591</td>
</tr>
<tr>
<td>3</td>
<td>Bengaluru</td>
<td>5323</td>
<td>835</td>
</tr>
<tr>
<td>4</td>
<td>Indore</td>
<td>5143</td>
<td>431</td>
</tr>
<tr>
<td>5</td>
<td>Kolkata</td>
<td>4104</td>
<td>407</td>
</tr>
<tr>
<td>6</td>
<td>Mumbai</td>
<td>3379</td>
<td>562</td>
</tr>
</tbody>
</table>

Top Five Cities with Higher Road Accidents

An analysis of road accidents in urban and rural areas for the calendar year 2016 reveals that rural areas are more prone to road accidents. The total number of road accidents in urban areas were lower (2,16,813) as compared to number of accidents in rural areas (2,63,839). The percentage share of accidents in rural areas and urban areas were 54.9 and 45.1 respectively in total number of accidents in the country. A comparison of percentage share of fatal accidents, total accidents, persons killed and injured in rural vis-à-vis urban is illustrated.

The table indicates that significant investment & improvement in rural roads is required for reducing accidents in rural areas.

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2 Road Accidents in India – 2016, Ministry of Road Transport & Highways, New Delhi.
The Role of Law in Prevention of Road Crashes

It is very unfortunate to know that in India there is no lead and independent agency to look after the issues of Road Safety whereas it has become the biggest challenge. India now ranks at top worldwide in terms of road crashes and casualties. The largest world economy and neighboring country China had subsequently reduced its road crash deaths to fifty percent in past ten years. Whereas in India the graph of road traffic deaths and injuries is still rising.

There is no specific or independent law governing the issue of road safety. The only prevailing law that regulates vehicles in India is Motor Vehicle Act 1988. According to the present situation of Indian roads, the technology of vehicles, vehicle population and enforcement etc. this law lacks provision to control and regulate road and road users. The law, according to its title, doesn’t govern the non motorized vehicles and pedestrians whereas these are considered as the one of the most vulnerable road users category in India.

The present law has turned ineffective due to several reasons:

- Not sufficient man power for enforcement
- The fines and penalties imposed for traffic offence has not been modified
- No comprehensive and transparent enforcement
- The bridge between vehicle population and enforcement manpower is increasing day by day
The Role of Smart City in Bridging the Gap

After swearing in as the 14th Prime Minister of India Mr. Narendra Modi launched the Smart City Mission in India. The idea behind developing Smart Cities in the country lies in the objective is to promote cities that could provide core infrastructure and give a decent quality of life to its citizens. The focus remains on sustainable development in myriad the areas with the use of technology by building smart solutions. The government wishes to create a replicable model that could aspire the other cities within and outside the nation.

Using public referendum the local administrations in their respective cities invited suggestions from the general public for the facilities the citizens foresee that must be included for developing a smart city. Based on the data collected, the central government declared twenty cities in the first phase to be developed as smart city in India, they are:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>City</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Bhubaneswar</td>
</tr>
<tr>
<td>2</td>
<td>Pune</td>
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<tr>
<td>3</td>
<td>Jaipur</td>
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<tr>
<td>4</td>
<td>Surat</td>
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<td>5</td>
<td>Kochi</td>
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<td>6</td>
<td>Ahmedabad</td>
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<tr>
<td>7</td>
<td>Jabalpur</td>
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<tr>
<td>8</td>
<td>Visakhapatnam</td>
</tr>
<tr>
<td>9</td>
<td>Solapur</td>
</tr>
<tr>
<td>10</td>
<td>Davanagere</td>
</tr>
<tr>
<td>11</td>
<td>Indore</td>
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<tr>
<td>12</td>
<td>NDMC</td>
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<tr>
<td>13</td>
<td>Coimbatore</td>
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<tr>
<td>14</td>
<td>Kakinada</td>
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<tr>
<td>15</td>
<td>Belgravia</td>
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<tr>
<td>16</td>
<td>Udaipur</td>
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<tr>
<td>17</td>
<td>Guwahati</td>
</tr>
<tr>
<td>18</td>
<td>Chennai</td>
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<tr>
<td>19</td>
<td>Ludhiana</td>
</tr>
<tr>
<td>20</td>
<td>Bhopal</td>
</tr>
</tbody>
</table>

3 www.smartcities.gov.in
The Core Infrastructure Elements of a Smart City

Smart Cities Mission of the Government is a bold, new initiative. It is meant to set examples that can be replicated both within and outside the Smart City, catalysing the creation of similar Smart Cities in various regions and parts of the country. The core infrastructure elements in a smart city would include:

i. Adequate water supply
ii. Assured electricity supply
iii. Sanitation, including solid waste management
iv. Efficient urban mobility and public transport
v. Affordable housing, especially for the poor
vi. Robust IT connectivity and digitalization
vii. Good governance, especially e-Governance and citizen participation
viii. Sustainable environment
ix. Safety and security of citizens, particularly women, children and the elderly
x. Health and education

The list given above describes some of the basic niceties of the urban development plan to reach the goal of a smart city. The list is not yet complete and the individual cities are free to add more features according to their prevailing environment and needs.

Sustainable Smart City – Future Safe and Effective Method for Road Safety

The new political regime has introduced many impending transformations that would certainly catalyze the rapid industrial and economical growth of our country, India. Developing Smart Cities in the country is one of the essential initiatives taken by the Govt. of India. This would help introducing multidimensional development in the selected cities.

Before getting up to or dreaming about living in a smart city, we need to understand the necessity, concept and the purpose of a smart city. When asked to a widest group of people about this concept, the immediate thoughts that swarms into their brain, is a technically advanced city only. Hallucinating, day and night, about an over illuminated city like Las Vegas is not something that a smart city bestows. It is

4 www.smartcities.gov.in
something beyond that, it is an imagination which is still concealed somewhere behind the horizon. That people needs to acknowledge.

The concept of a smart city is basically delineates to develop a system, with intervention of the information technology, would save power, energy, maintain cleanliness, offer timely & hygienic medical health services, protect the environment, conserve cultural heritage, conserve flora & fauna and above all it will dispense a lifestyle that interestingly, will save human efforts and time.

Efficient transportation system plays an important role for the economic development of every city. Being smart or not effective and accessible public transport is the need of the hour. Despite the expansion of road network the problem of inadvertent traffic congestion and road accident fatalities are on the rise in every emerging city is alarming. Implementing safer, accessible and efficient public transport system is the only comprehensive solution that could be foreseen to curb the issue of road accidents.

In the pretext of developing a smart city it is essential to contemplate about developing an Urban Transport Plan that could answer the issue of safety and transportation needs of people living in. The transportation system plays an important role in elegancy of the city. It is required to build a Transit Oriented Development (TOD). There is need to encourage Non Motorized Transport System and Public Bicycle System in every city. Developing Unified Metropolitan Transport Authority (UMTA) and Urban Transport Fund are also required for strengthening the public transport system.

Before transforming and building up the new infrastructure for unified public transport it is essential to rectify the engineering flaws of existing roads including bridges and flyovers. A competent team of auditors must exercise the road safety audit at par international standards eradicate the road engineering faults. The meaning, usage and importance of road furniture must be recognizable to the general public and proper attention should be paid for its maintenance.

**Objectives of the study**

To comprehensively evaluate issues regarding road safety like the public transportation system and remedies as per the laws of developed nations and trying to implement the same in India. Learning from the best practices of sustainable cities, such as provisions for vulnerable road users, the public bicycle sharing system, provisions for non-motorized vehicles, ensuring safe infrastructure standards, effective policy for enforcement, need for unified metropolitan transport authority
(UMTA) and parking management. This article also focusses on the current scenario discussing several issues that are deemed as important to resolve for creating sustainable cities in India.

**Issues With Public Transport System & Remedies**

Lack of a predefined fare policy & procedures, ineffective control on operation of stage carriage and contract carriage, unnecessary competition and unavailability of timely means of transport to the commuter, these are some of the basic issues related with the operation of the public transport. Without forming stringent policies for managing public transport system in a city it won’t be possible to visualize about smart transportation system.

To put a break on the rat race of different public transport mediums, it is necessary to bind and control all the mediums under one authorial system. This could be done by forming a Unified Metropolitan Transport Authority. UMTA must be headed by an experienced and technically sound professional from the Transport Department. UMTA would have autonomous control over all means of public transport mediums excluding auto rickshaw and taxi.

In the new system of transportation governed by UMTA all stage and contract carriages would be hired on a fixed contract on monthly basis. With the immediate effect the rivalry and competition would come to end.

The route of all the carriages will be fixed and they will be issued permit according to their route plan. The availability of stage carriage would be decided according to the volume of passengers available during the different hours of the day. The carriage would ply according to the fixed schedule provided to them. Strict penalties could be imposed on those who fail to follow the schedule.

A unified electronic fare collection system should be implemented. This will also facilitate the commuter. The ITS based last mile connectivity based smart public transport system would offer a hassle free method to roam in the entire city using a single ticket.

These tickets could be obtained from different locations including bus stops, railway station, metro station, public places, malls and even general stores. Apart from the specified locations ticket vending kiosks could be installed on different locations in the city. The unified ticket could be issued for hourly, daily, weekly or monthly basis. With the use of the electronic fare collection system the public transport could also be made conductor free.
To build the Transit Oriented Development it is necessary to develop a Transport Hub that integrates and interconnects various modes of public transport such as Metro, Mono Rail, Bus Rapid Transit System (BRTS), City Bus, Auto Rickshaw and Public Bicycle Sharing System. The ITS enabled integrated public transport system must support Advance Travel Information System (ATIS) which will offer ease of travel and help in saving time.

Developing hi-tech integrated transport mechanism alone won’t be able to resolve the issue of traffic congestion on road. Without ample community participation it will be difficult to imagine the success of a smart transportation system. To encourage the mass for shifting to public transport instead of private vehicles for their daily needs a paradigm shift is required from paid to subsidized or free public transport. Besides integrated transport system there must exists an equivalent integrated fare collection mechanism that could work at par all the modes available as public transport.

In Belgium the public transport is operated on subsidy in ratio of 67:33. The public transport is offered free to students. Similarly, the vehicles approaching the city from distant areas, when reaching into the vicinity of forty kilometers, should automatically become the part of integrated transport system. This would prevent any kind of obstacle in the flawless movement of the traffic within the city.

Public Bicycle Sharing System

In many European countries bicycle is considered as the most effective, pollution free and economical method for public transport. Countries where cycling is widely used, like Denmark, bicycles are provided for free to the local citizens. To encourage cycling in our country a separate infrastructure should be build, like dedicated cycle track. Separate policies for cycling must be formed to offer safety for bicycle riders. Public Bicycle System could be developed so that people could hire cycle from one bicycle point for their journey and should drop the same at the bicycle point available near by the destination. This would offer great ease of portability to the road users especially pedestrians and the tourists visiting the city.

Provisions for Non-Motorized Vehicles

The non-motorized vehicle includes pedestrians and bicyclists. Apart from building the cycling tracks the pedestrian movement facilities needs to be enhanced from the points of their safety. The road must offer walkway or footpaths for pedestrians. For safe road crossing dedicated pedestrian crossing, foot over bridge and
subways should be built. Pedestrians should also be trained about the safety measures they should take while moving on road.

**Infrastructure Standards**

There are three kinds of standards pertaining to road safety. First is Vehicle Standards which are recommended by Automotive Industries Standards (AIS). Second is Road Standards which are governed by Indian Road Congress (IRC). The last is Road User Standards which can be divided into two segments, Motorized Vehicle Road Users and Non Motorized Vehicle Road Users.

Driving a motorized vehicle is governed through the Motor Vehicle Act. The law came into existence in 1989. Currently all the vehicles are issued Registration Certificate and Drivers of these vehicles are issued Driving License that is governed under this law. The existing process of issuing driving license is not that much effective. It is required that the driving licensing system must be made effective, transparent such that license could be issued to the competent applicants.

On the contrary, there are many accidents that are caused due to non-motorized vehicles. These include Battery Operated Vehicles (BOV), bicycle, cycle rickshaw, hand pulled and other kinds of carts. All kinds of non-motorized vehicles and road users do not come under the periphery of the motor vehicle or any other act. Since, there are adequate amount of non-motorized road users and they are the most vulnerable too because mostly they seldom obey any traffic rules. Thus, it becomes a stringent requirement to spread road safety awareness among this category of road users. By creating awareness at large, this vulnerable group of road users could be turned into the safe road users in the country. Few standards should also be laid for this category of road users and they must be enforced to obey the traffic rules.

**Policy for Effective Enforcement**

The present enforcement system is more or less surrounded by controversies and complications. The maltreatment and abuse of the present enforcement system has made it ineffective. To make it competent and effective the first thing that is required on the priority basis is to make it transparent through complete automation. Integrating the enforcement system to the Traffic Management System with the use of ITS could be made effective, transparent and comprehensive.

**Need for Unified Metropolitan Transport Authority (UMTA)**

Integration of all the mediums of public transport could not be achieved till it is controlled centrally by a system. The structure should be evolved in a manner that the different sources of public transport from metro to public bicycle system should
be controlled and monitored by UMTA. In addition, the different forms of public transport must function independently in their own periphery without any intervention of UMTA. Their management of finance must also be controlled to centrally, and the entire transportation hub must be fuelled by an Urban Transport Fund (UTF).

UMTA and UTF must be formed in every city to control the unified public transport system. Individual cities should be given sovereignty to reframe traffic management policies and traffic rules to manage and enforce the traffic according to their own traffic condition and geographical constraints.

5Parking Management

Pretting could be used as an effective measure to reduce traffic congestion in the city. Lack of effective and timely public transport encourages public to utilize their private vehicle. More and more vehicles on road would demand for more parking. We need to ensure three things to reduce the use of private vehicles. First, before applying the parking policy for a city, its public transport system should be made comprehensive and accessible. A stringent parking policy must be framed that should levied heavy parking fee in the most congested areas which would help restricting the use of private vehicles.

New parking places could be developed on Public & Private Partnership (PPP) basis. It must be ensured that adequate parking areas should be reserved in residential areas, multi-storied apartments. Despite the residents of the apartments, parking fee must be charged from the owners of additional vehicles utilizing the parking area of other apartments. Ample parking should be made available at railway stations, bus stand etc. Private and public vehicles parked in the no parking zone should be toed or removed from the area. Parking should be made chargeable in markets and that must be governed by Taxo Meter. It can also be controlled while integrating it to the ITS through Advanced Parking Management System. The hourly parking fee will lead to lesser traffic congestion on the road and during the peak hours. Where there is scarcity of space, multilevel parking system or underground parking space could be built.

Issues in Manual Parking Systems

Most Indian cities are seeing a growing vehicle population causing road congestion and pollution. Parking spaces are getting scarce. Public's interaction with parking operators all of which are based on cash payments are a source of harassment and growing corruption.

5 Parking Management for Smart Cities, Span Technologies, New Delhi
Parking tenders and lucrative site allotments are being politically manipulated to favor a chosen few, with toll-bypass being an accepted norm resulting in revenue loss to the Municipality. After tender allocation, the Municipality loses control of the situation and remains helpless even while the public suffers through the wrong doings of a parking mafia which does not respect the law. The end result is that the harassed road users feel helpless and become impatient with the prevailing situation. Road rage taking its toll within the city is one of the consequences of such public frustration.

All across India, currently public parking is handled using uneducated manpower at site. This has its limitations and creates more chaos primarily due to usage of parking space beyond available capacity. Added to this, lack of improvement of the parking environment takes place due to under reporting of revenue collected.

India's plan for building Smart Cities need to overcome such parking problems through the use of game changing technology. In such circumstances, where space continues to be a major constraint and pollution a major threat, its optimum use through automated systems is the only way forward. Need of the hour is to deploy computerized system based fool-proof parking solution at such sites which can work on 24x7 basis even without human interface.

Safe and smoothly-flowing traffic is necessary to maintain modern economy and life style. Efficient transportation expands the range of opportunities for residents and contributes to the welfare and prosperity of urban centers, constituting an integral part of smart city approach. For smooth public transport, it is necessary to deploy intelligent solutions that include traffic management with rule enforcement for automated parking.

To handle growing urban vehicle population, building more roads and parking spaces is not the only way out of this dilemma. A comprehensive mobile based payment solution that makes optimum use of available parking space and aggregates it with other complimentary needs of a road user need to be seriously considered. So as to become a win-win proposition to all, such a solution has to work as an aggregator for servicing the needs not only of the road user, but also of all other players in this ecosystem.

Research Methodology of the Study

The study relies on observational studies and first hand experience of the researcher. Informal and semi-structured interviews with the parking operators, law enforcers, municipality officers, road users, traffic police, and business partners helped generate evidence base for the study. The perspective and viewpoints of the
aforementioned stakeholders have been discussed in detail in the proceeding section. The article also emphasized on the interlinked phenomena between public transportation and sanitation and how its effective management can help build sustainable city and safer roads.

**Role of Parking Operators, Law Enforcers and Municipality**

It has to be one platform that works at addressing various needs of the road users all across the city (and even the country) as also every other player within the operating environment. Today, with the growing use of mobile phones, cloud based computing technology, provides such an opportunity to the Government to deploy a city-wide centralized parking solution viz. for Delhi with its over 5.8 million two-wheelers and 2.7 million cars.

**Road Users Point of View**

- It should work seamlessly across a city (and preferably across a country ultimately) both for on-street and off-street parking - on 24x7 basis. Also be usable on toll roads without the need to stop and pay. Thus, it should not be dependent on any human interface.
- It should be easy to activate and accessible from any mobile phone: feature phone or smart phone or prepaid card for even an illiterate user.
- It should be easy to use across languages and help to locate/reserve available parking space.
- Navigate to it, end or extend the parking time and pay for it using one click mobile based payment process in a manner which generates receipts, usage history reports etc.
- It should be usable for payment of toll and traffic violations, fuel, insurance, washing, towing, tyre repairs and purchases at convenience stores.
- It should be supported with SMS, helpline; IVR Parking session by the user could start and end using two different means.

**Parking Operator’s Point of View**

Parking operators would like to keep the road user informed about the status of parking availability at his end and seek a convenient way to handle payments without the least burden of technology deployment. Thus, they would like to:

- Attract the user by informing him of parking availability
- Monitor the parked cars for duration of usage
- Collect payments without using payment machines. At the same time, they wish to avoid
- The hassle of handing out change or swiping cards for small value payments.
- Monitor parking violators and be able to penalize them on the spot.

**Role of Traffic Police in Parking**

Traffic police would like to facilitate fast track traffic movement. Hence they would like to advise traffic status, congestion, accidents, blocked roads and available parking in an area.

- They would also like to identify traffic violators and receive payments from them for traffic offenses.
- Police can check for stolen cars through LPR based verification of all parked vehicles.

**Role of Other Business Partners**

- For fast track traffic movement, Toll stations should be able to eliminate "stop and pay" reduce number of manned pay stations.
- Gas stations and convenience stores would like to fast track their transactions to reduce user waiting time.
- Service stations would like to promote their car care services - repair, towing, tyre puncture, car-wash etc.
- Insurance companies would like to be available 24X7 to meet vehicle owner’s insurance needs
- Banks would like to facilitate smooth payment transactions to the mobile user at all times.

**General Parking Guidelines**

There are certain guidelines that must be issued for the welfare and convenience of the general public pertaining to the norms of the parking. They could be summarized as follows:

- Parking must be automated and accessible to the vehicle owner on 24x7 basis.
- The parking must be charged on per hour basis and different tariff plans should be made according to the weight and size of vehicle.
• For transparency the parking systems should be levied through electronic payment system.

• For fare calculation of the parking charges taxo meter must be installed at designated parking stops.

• The vehicle carrying multiple passengers and those used for public transport must be offered parking at subsidized rate.

• The parking at railway station, bus terminus etc. must be free of cost for the passengers.

• The apartments being constructed must reserve twenty-five percent extra parking spaces for social gathering like marriage and parties.

• The organizer must contact the traffic police to ensure free flow of traffic in case of marriage and public events even though they have ascertained the parking management.

• Before the purchase of new vehicle, the automobile dealer or the traffic police must ensure the availability of ample parking space with the vehicle owner.

**Building Traffic Parks in India**

According to the population of the city Traffic Park cum Training Center could be established for the general public. The following are the key highlights that could be included in the park:

• History and details of major traffic crashes of the world, state and the district.

• Eye Testing Center

• Steering Balance Test

• Simulators for Two Wheeler, Car, Jeep, Bus, Truck etc.

• Crash Test Demo

• Old and New Vehicle Technology

• Vehicle and Road Codes

• Hall for showing videos related to Road Safety

• Road Markings, Road Signs, Traffic Signals demonstration

• Safety Measures and Maintenance of Vehicle
Public Transportation and Sanitation – An Interlinked Phenomenon

In tune with the smart city mission the government of India has also initiated the nationwide campaign of clean India which is termed as Swachh Bharat Mission. Through this mission a humble appeal has been made to the citizens of India keep cleanliness in our surroundings being it our residential areas or workplace. This nationwide campaign has been introduced to aware the mass about the health benefits behind sanitation.

Several psychological studies and researches reveal that the clean environment also helps in offering a positive attitude towards our daily activities and driving is also considered as an important part of our routine.

The way the garbage is collected and dispensed in India is not hygienic and invites several hazards to the environment, stray animals and even the moving traffic. For example the below picture of the garbage bin explains the habitat around the place. The surrounding area is dirty and unhygienic. This also attracts stray animals. Cows eat content thrown in polythene bags and eventually they die due to blockage in their stomach due to plastic. And further the unnecessary stray animals on the road become a cause for the road accidents.

The use of semi underground garbage bin is the most effective solution to this issue. In tune with the European countries these kinds of bins can also be installed in India. Although, these bins, in imported from European countries, if imported would cost around 2 lac Rs. including import duties and other taxes. These bins can also be manufactured in India under the Make in India campaign. Manufacturing these bins would bring down its cost to around fifty thousand Rs.

6 How can India become developed & corruption free, Anil Tripathi
These bins offer a horde of advantages, like:

- Its semi underground hence does not litter.
- Surrounding remains clean that one can even sit besides its.
- Its packed so stray animals would not be attracted and they will also remain safe.
- It does not foul thus commuters and passerby can pass through the area without any hesitation.
- Neat, clean and healthy and safe environment for traffic as well.
- The capacity of bin is 3 tons and can serve the garbage collection for 250 homes.
- It can be emptied within 1 minute through JCB.

It is evident that if our roads would be clean, clear and pollution free then in effect to it will create a positive effect to keep the road users vibrant and filled with positive energy. The road users having a stable mindset would be less prone to rash driving that will result in creating a safe and healthy environment on roads.

It has been noticed that erstwhile people mostly create litter at the public places including the public transport. Mostly trains and buses stuffed with passengers used to have unhygienic situations. But after this mission not even the public properties even the efforts are also put in to keep the public transport clean and hygienic. Indian Railways has launched helpline number where the passengers could call to report any unhygienic situation in a coach.
It is believed that a clean environment would also help in reducing the number of road crashes to some extent and would add an important milestone in achieving sustainability for evolving towards smart city.

**Conclusion**

Smart cities are not build overnight. It requires consistent effort from the law makers, the administrators, stakeholders and most importantly the cooperation of the citizens of the country. As the nationwide campaign like "Swach Bharat Mission" takes a firm footing, sense of awareness and responsibility among the masses is created with the help and support of the media. Similar endeavor from various stakeholder departments highlighting different issues of concern as brought fore in this article shall help make and grow India as a sustainable nation with safe infrastructure, safe roads and safe environment.

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SPREADING ROAD SAFETY EDUCATION & AWARENESS

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Present Scenario of Road Accident in India

Road Accidents statistics reveals a very grim picture of India’s concern for road safety issues in last few decades. Over 1,50,000 people were killed in road accidents in 2016 alone, that is more than the number of people killed in all our wars put together. 16 children die on Indian roads daily. There is one death every four minute due to a road accident in India and drunken driving is one of the leading causes of road fatalities. One serious road accident in the country occurs every minute and 17 people die on Indian roads every hour. More than 1314 road crashes occur every day in India. Two wheelers accounts for 25% of total road crash deaths. 29 youngster under the age of 18 die every day due to road crashes in the country. Over 413 people die every day, equivalent to a jumbo jet crashing every day. Two people die every hour in Uttar Pradesh – State with maximum number of road crash deaths in India. Tamil Nadu is the state with the maximum number of road crash injuries. Top 6 Cities with the highest number of Road Crash Deaths (Rank–Wise) are, Chennai, Delhi, Bengaluru, Indore, Kolkata, Mumbai,

- In India there has been a decrease in Road Accidents fatalities in the first 3 Quarter upto September, 2017 (1,08,887) as compared to the 3 Quarter of 2016 (1,13,891).

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- In Rajasthan alone there has been a decrease in road accident fatalities by 1.1% in the 3 Quarter of 2017 (7778) as compared to the 3 Quarter of 2016 (7862).

- In concerned 5 districts in Rajasthan 3.2% decrease in Road Accidents fatalities in the 3 Quarter of 2017 (1521) as compared to the 3 Quarter of 2016 (1565).

This data clearly reveals that steps are being taken to reduce the fatality rate in some parts of the state. A secondary study was conducted to know the initiatives undertaken by

Understanding the fact that the Road Safety is not only the shared concern but also the shared responsibility of all the Road users, Rajasthan Road Safety Education and Awareness Mission operated by Rajasthan Sadak Suraksha Society – a Rajasthan based not-for-profit organization which in sponsored by Hindustan Zinc Limited and All India Federation of Motor Vehicle Department , established to promote the need for creating the accident free environment, has now taken up a theme of “Swachh Bharat, Swasth Bharat, Surakshit Bharat”. Here, the meaning of 'Swachh' includes clean Vehicle, clean Road and Clean Road user. Similarly, 'Swasth' includes Fit Vehicle from all engineering aspects, Fit Road & Fit Drive. Lastly 'Surakshit' includes Safe Vehicle, Safe Road Users, Safe Road and Safe Environment. This Project was started from July 2013 and till October 2017 it has educated among 3.12 Lakh Road Users.
INTRODUCTION

Road Transport is not a stranger to regulation. One of the earliest attempts at regulation is perhaps the Motor Vehicles Act of 1939 where services are provided by an assortment of small operators with no loftier purpose than to make a fast buck and it becomes the primary responsibility of the government to ensure discipline, safety and accessibility. While goods transport continued to be unorganised and privately run, passenger road transport came under the preview of large public monopolies organised under the provisions of Road Transport Corporations Act 1950.

These large public undertakings, ironically, were the reason for the stunted growth of regulatory mechanism since, as an extension of the government, they took on the role of self regulation. The transport departments, whose role it was to regulate, reduced themselves to mere collectors of taxes with little or no interest in evolving the transport policies and ensuring, road safety much less addressing themselves to the growing menace of automobile pollution. If liberalisation means increased privatization, government will have to come in a much stronger way not only to control operational discipline but to enable higher standards of quality, comfort and safety.³

The inadequacies of 1988 legislation were compounded by a lack of appreciation of the stellar role played by State Transport Undertakings in promoting transport through the post-Independence decades. It took away the power of STUs to publish and modify schemes and equated them to fly-by-day causal one-bus operators. It encouraged proliferation of contract and tourist

carriages fully realising that the administrative machinery is neither able nor willing to enforce permit conditions. It has encouraged unsafe, fuel inefficient and polluting modes of transport to compete with safer and more sustainable public transport. With no means of encouraging quality it ran down whatever quality STUs were striving to offer. If the entire passenger road transport sector is today languishing, some responsibility should be borne by this half-baked legislation of 1988.

**IMPORTANCE OF THE STUDY**

Road Safety is a safety concept for traffic. There is no appropriate definition of traffic in Indian statues. Firstly, traffic includes all types of road users who use carriage way. The carriage way users include motorized and non motorized users. The concepts of road safety involve both of things motorized and non motorized users. Motorized users are all automobiles whether it is two-wheeler or three, four, six or more. Non Motorized users are pedestrian, bicyclist and animal carts etc. The research problem is a process to solve a catastrophe of road accidents, a sustainable road safety is necessary for all road users : Safe vehicle, Safe Road, Safe Road user with is safe environment. This research is introducing more implementation of present standards of vehicle road and road users to ensure the safety measurement of the traffic.

Road safety is an issue of national concern, considering its magnitude and gravity and the consequent negative impacts on the economy, public health and the general welfare of the people. Today, Road Traffic Injuries are one of the leading causes of death, disabilities and hospitalizations, with severe socio-economic costs, across the world.

Road accidents are increasing day by day in India and so as the number of fatalities, injuries and lifelong disability is increasing in the similar proportion. The
system that was devised decades ago is not enough to control the present situation. It has become the need of the hour to develop new methodologies, new rules and above all, generating awareness among people has become the prime necessity.

Road fatalities and injuries have emerged as a threat, not only in India but it's aftermath could be seen around the globe. Now it has become a global threat. Only in India more that 1.50 lac people die in road crashes every year which is a serious issue. There is no single agency in India to look after the road safety scenario alone.

Today India ranks the top most country in terms of road accidents and fatalities. As compared to the densely populated country China had controlled the number of accidents and fatalities at a great extent since 2006 and India is ranked first in terms of road accident fatalities.

Road Safety issue involves role of several independent departments such as Transport Department, Police, PWD/NHAI, Medical, Law, Insurance, Planning and Local Body etc. Since they have independent work area hence the lack of proper coordination among these departments the safety issues have not been implemented successfully.

Lack of proper scientific investigation is another reason. In India the investigation of fatalities is not carried in a way like the proper investigation methods involved in the criminal cases. Hence almost every time the actual cause of the fatalities always remains under cover.

SUGGESTION

To address the issue of imparting Road Safety Awareness among school children and public at large, a unique National Road Safety Education and Awareness Mission shall be launched which will educate various target groups.
This mission or project could be segregated through a cluster of police stations present in the nation.

India has around 15,000 police stations. If a cluster in a state made such that around 150 police stations gets clubbed forming a cluster then it would require one Road Safety Mobile Van per 150 police stations. Thus, around 100 mobile vans would be enough to cover the entire country for the nationwide campaign. In any area or region if the number of police stations exceeds 75 it may be deemed as a separate cluster or unit.

Accidents are caused due to human negligence and are not an "Act of God." As perceived to be. This could be because of lack of knowledge or error of judgement on part of the driver / user of road. To avoid accidents stricter norms for issue of driving licence and periodic knowledge imparted to users of roads to like vehicle, petition, non motorized vehicle etc. In order to achieve this we should have of a fair and transparent mechanization deviced for issues and licence and knowledge share.

**SCOPE FOR FURTHER RESEARCH**

- It will be helpful in providing the safety for vulnerable road users such as pedestrians and other non motorized road users.

- It will bring reforms in terms of Road Safety as every individual road user in the country will follow rules more stringently.

- It will help Universities and Educational institutions to impart new field of education in the name of Road Safety by launching related courses on the issue.

- It will also help reducing road mishaps and number of fatalities in India.
It will also help students as they will come to know the practices in Road Safety Laws in India.

- It may be helpful for law practitioners.
- It may let dawn new path for new researcher/scholar.
- It will help in making a balance between technology law and human safety.
- It will help a citizen in making law abiding society where every citizen will be safety conscious.

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