

# Crying Need for India's Optimised Traffic Paradigm: Amethi District as the Test Bed

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**Abstract:** India's economic growth in last 2 decades is tangibly visible on the roads, streets, dirt tracks, lanes of its cities, towns and countryside. These are all carrying the booming traffic of cars, buses, rickshaws, large monster size trucks, motorcycles, cycles and pedestrians. India's traffic of today is reminiscent of the chaos of Wild West of America of last century. Large numbers of road accidents are leading to precious loss of lives. According to one study, in case of road crash deaths, India's most populous state Uttar Pradesh topped the list of accident related fatalities with a percentage share of 12.8% followed by Tamil Nadu (11.4%) and Maharashtra (8.6%) in 2016. In 2017 again, Uttar Pradesh led the nation in having maximum casualties at 20142. Therefore, there is a compelling need to address the growing chaos with an effective, optimized, engineered Traffic Management and Regulation covering aspects of Traffic optimization, Safety measures, and consolidation of automobiles. Since India is a signatory of Brasilia Declaration for bringing down the road accident related fatalities by 50% by 2020, it is imperative to adopt a basket of corrective/preventive and prophylactic measures to bring back the dignity to human lives. There is a crying, crying and crying need to address the problem. This paper is an attempt to present these issues with some solutions. Amethi District of Uttar Pradesh can be a cradle of fresh ideas of Traffic Management and Traffic regulation.

**Keywords:** Traffic Optimization, Accidents, Roads, Traffic Regulation, Road Fatalities, Amethi District Traffic Plan, Intelligent Traffic Management System

## 1. Introduction

The roads and highways in India are becoming the new killing fields borne out of gaps in regulation, enforcement, bad traffic etiquette, primitive skill sets of drivers, negligence, technologies and integrated surveillance. In major state of Uttar Pradesh there is no respite from the casualties on road. Uttar Pradesh has consistently had the ignominious tag of having the highest number of casualties. In 2016 and 2017, Uttar Pradesh suffered the highest number of road fatalities in pan India as per the data compiled by leading authorities.

In pan India context, according to official statistics, road accidents in 2016 alone were a whopping 4, 80, 652. The number of people killed were 1, 50, 785. However, the gruesome part of the big picture is that people injured is almost 3 times higher at 4, 94, 624. Uttar Pradesh suffered the maximum number of 19, 320 fatalities followed by Tamil Nadu with 17, 218 fatalities. Again from the recent data of 2017, Uttar Pradesh again had the maximum road accident deaths of 20142. The graphic below elaborates this aspect.

**Top 3 of Top 13 India's States:** Share in Total Number of Persons Killed in Road Accidents (in percentage) in 2015 & 2016

		2015	2016
	% share	Number of Persons Killed in Road Accidents	Number of Persons Killed in Road Accidents
Share of 13 states	83.71	1, 22, 153	1, 26, 159
Uttar Pradesh	12.8	17666	19320
Tamil Nadu	11.4	15642	17218
Maharashtra	8.6	12935	13212

Further, it has been gathered from data that road accidents in rural areas are more compared to urban areas. In 2016 alone,

total number of road accidents in urban areas were lower at 2, 16, 813 whereas the number of road accidents in rural areas were 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. This clearly gives us the hint that unregulated/loosely regulated /unchecked traffic on highways and outside cities is causing distress for many families in India.

In the period of January to December 2017, Amethi District in Uttar Pradesh, India reported 290 Road accidents of all types. In these accidents, 157 deaths to human lives were reported. Further, 144 Injuries were also reported. The sad story continues. In 2018 from January till 19<sup>th</sup> March 2018, 51 Roads Accidents were reported in the District. Out of these, 30 deaths and 31 injuries were reported.

The irony is that there is no straight correlation between the size of vehicles and deaths. In fact, 2 wheelers related vehicles have caused 34 % of the accidents followed by cars/jeeps/taxis at 23 % and followed by trucks/tractors/other such vehicles. National Highways, though 2 % only of India's road grid, account for cause almost 34% of the fatalities.

## 2. Outline

The authors of this paper have first hand witnessed with growing angst and perturbation the large number of accidents on Lucknow-Rae Bareli-Gaurganj-Korwa-Sultanpur highway in Amethi District of India's Uttar Pradesh state in 2017 and 2018. Some of the images taken on the accident sites are presented here subsequently. The images show the horrendous nature of the accidents. Casualties which resulted have been too gruesome and not considered for showing here.

There is a crying, crying and crying need to address the problem. Even India's low intensity conflicts in Kashmir, North East and Chhattisgarh may not be causing so many deaths as are taking place on our vast Nation's roads. The new predators for Humans are not Tyrannosaurus Rexes or tigers or leopards or lions but the rogue (also innocent) monster humans and automobiles on the roads. 21<sup>st</sup> century gave us comforts of great personalized travel but it is snatching these pleasures from us with relentless accidents.

Each one and all of us must do something to solve this crisis. Human aspect may be more important than viewing things from the prism of narrow statistical sense of number of accidents, severity etc. Paradigm for Accident Mitigation and Accident free Assurance must now be ingrained in our daily culture. Amethi District can easily become the testbed to improve on the Road sensibility for India's safe future having mixed urban, urban-rural, large towns and several categories of rural and National Highways in its jurisdiction.



**Figure 1 to 4:** These images were taken near Korwa in Distt Amethi, Uttar Pradesh



**Figure 5 to 6:** These images were taken on Gauriganj- Munshiganj stretch of National Highway in Distt Amethi, Uttar Pradesh



Figure 7 to 8: These images were taken near Fursatganj in Distt Amethi, Uttar Pradesh



Figure 9 to 10: These images were taken on Gauriganj- Sardan stretch of National Highway in Distt Amethi, Uttar Pradesh



Figure 11 to 13: These shocking images were taken near Korwa, Shardan and Munshiganj areas in Distt Amethi, Uttar Pradesh

### 3. New Paradigm Focus on Accident Mitigation and Accident Prevention

Following paragraphs give out some of the suggested new ideas/solutions/technological trends/futuristic/imagined trends for the improvement of Traffic Sensibility/ Road safety and Accident Mitigation and Accident Prevention for congested cities and outreach areas in the vast subcontinental landmass of our great nation India.

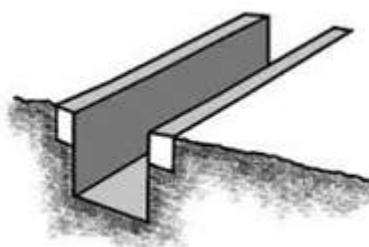
### 4. Time Bound Implementation of ISO 26262

ISO 26262 is an International Standard developed by the prestigious ISO organization in Geneva. The Standard is an evolved form of IEC 61508 Standard. This Standard gives various guidelines related to the functional safety of Road Vehicles. India must immediately adopt this Standard across all states before a target date. This will provide a big leap towards the safety of Vehicles, persons and property on India's roads. However, coming disruption/evolution of vehicles due to emerging trends in vehicles because of Electric and fuel cell technologies must be factored in appropriately in anticipation. Various important aspects covered in this Standard are:-

- Management of Functional Safety
- Concept Phase Planning of Vehicles/Vehicles components/assemblies/sub assemblies
- Product Development at the System level
- Product Development at the Hardware level
- Product Development at the Software level
- Supporting Processes Reliability Ecosystem e.g. Configuration Management, Change Management, Qualification of hardware/software components etc.
- Automotive Safety Integrity Level(ASIL)-oriented and Safety oriented Analysis
- Guidelines on ISO 26262

### 5. Proactive Parking Regulations

The growing fleet of automobiles in India is leading to dwindling open spaces and trees. Every inch of space is being gobbled up by trucks, huge hauler trucks, cars and other vehicles. Automobiles are now as ubiquitous entities as humans. They must, therefore, be given "dignity".



**Figure 14:** These are the possibilities of Sunken Highways

- **Double Decker Highways** - As India develops rapidly there will be much more traffic volume on the roads. Accidents can be reduced if we have a Double Decker

Parking them on roadside is dangerous for them as it would be for a human being on the road. It is proposed to develop countywide multistoried buildings for parking purposes. Traffic Regulations must be developed in order to ensure "No parking on Road "policy. Roads, lanes, bylanes must be totally free from vehicles parked. Definitely this implementation will not be possible by human cop or any other category of persons because he/she will get swayed by empathy, sympathy, pressure from people. A specially developed hardened Robot will be better able to address Traffic Regulations/violations. The same will help bring some sense to respecting the actual purpose of the road i.e. for driving of vehicles.

### 6. Corridor Separation

There is a necessity to separate the pedestrians walking on roads where automobiles move. On the roads where heavy automobiles are plying, the design should be such as to discourage pedestrians and make it a challenge for them to move. The era of "Traffic freedom" is over. This implies that as responsible citizens, people must respect the delineation/separation on automobile corridors and vice versa pedestrian /leisure corridors must also be respected by vehicles. This will go a long way to save lots of lives of humans and animals. Following more possibilities are suggested:-

- **Sunken Highways or Landslide highways** – The National Highways passing through dense corridors can be over passed by flyovers. This is an expensive proposition. One cheaper method could be make highways in a "sunken, deep drawn" configuration. This will ensure that general public does not make a mess of clogging the roads and Highways. This is a big problem in India's cities especially in Uttar Pradesh. The vertical cliff like appearance will deter public to venture into these highways. The menace of hawkers and general public disturbing the traffic on the highways will be curbed to a large extent with this methodology. The hawkers will be too scared to sell their wares in sunken highways.

Highways. These highways can be made in such a configuration that lower deck highway caters for heavy vehicles like trucks, trailers, long transporters etc..The top

deck can be exclusively for light vehicles like cars, jeeps, SUVs etc. Cost may be high but can be recovered with intelligent and encouraging levy of tolls. Also, this is now imperative to move to the next level of Travel Safety value chain. Many developed countries are on this

trajectory. In certain areas 3 to 4 decker highways may also be necessary.

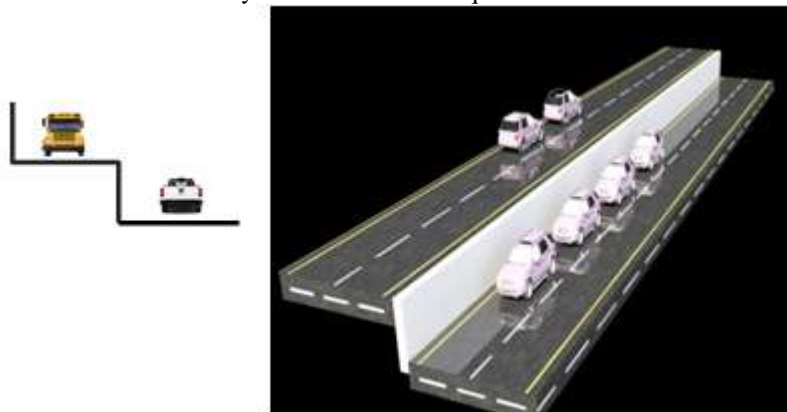


**Figure 15 to 16:** These images represent some futuristic possibilities for Amethi region

- **Flexible Highways-** Our roads and highways are getting crowded day by day. People and Institutions have tendency to move close to these highways. There must be a system to thwart development around the highways by changing their configuration on a periodic basis. The configuration may be changed randomly with surprise the way PM Modi surprised us all on 08 November 2016 by his surprise Demonetization decision. This way roads near

to highways will be left untouched by land sharks and greedy developers and shop owners.

- **Deliberately Unlevelled lanes** – The highways can be designed in such a way that traffic on one lane does not intrude into the other lane. One lane must be kept always well elevated with respect to another. This will go a long way to prevent the accidents. However, there may be requirement of Crash barriers at strategic locations.



**Figure 17:** Concept of unlevelled lanes

**7. Road Integrity**

Respecting the Road Integrity is paramount. In India, roads are encroached in a rampant manner by many people especially the hawkers and other sundry people. This causes loss of time and efficiency across all levels leading to wastages across the Economic value chain. There should be will and targeted efforts to sensitize the public to preserve road integrity. All possible measures in this regard must be implemented.

These days many people are using smartphones for various purposes. The smartphone Applications can be effective to reduce the accidents. The graphic below shows certain possibilities fro Amethi District in this regard.

**8. Activation of District Road Safety Committees**

Amethi District can be a great testbed to pilot, trial evaluate and validate the institutionalized mechanism whereby the District authorities in sync and synergy with leading citizens and “road Good Samaritans” can play a leading role in mitigating the accidents in the area. Active Traffic Vigilance and use of technology can be very useful for doing this.

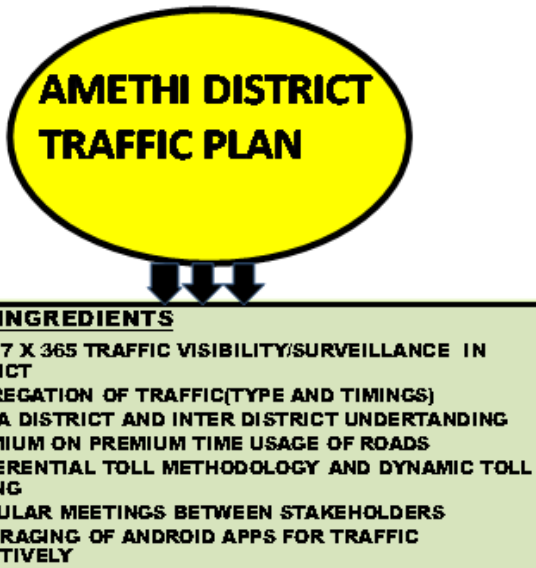


Figure 18: Amethi District Traffic plan Concept

Some of the possibilities in this regard could be:-



Figure 19: Effective signages and sign boards can be very helpful during night driving

### 9. Regulation of Traffic according to District Traffic Plan

On the lines of ATC Regulated traffic management at airports, there should be a District Central Regulatory Authority to regulate, control and facilitate all traffic movement in the district. This can be possible by getting a spectrum of data from Traffic drones, Traffic radars, eyewitnesses, CCTV cameras and satellites. Handoff Methodology must be worked out within District and between neighbouring districts. Aim should be to capture the data of accident in near real time/real time. Other ideas are:-

- Tendency for long distance trucks to pass through peak hour traffic of towns/cities in Amethi District should be disincentivised by levying reasonably high **Premium Time usage charges** in the mornings and evenings.
- Differential /Graded Tolls on National Highways whereby for non peak times tolls should be lesser than peak times.
- Imposing traffic curfew for certain type of vehicles for particular times. This may seem difficult but imagine there were not many traffic lights even in metros like Delhi 30 years ago. We must remember that days of traffic freedom are over Cattle curfew for farmers may also be thought of to reduce the movement of cows, buffaloes, herd of sheep etc..“ **Traffic was born free, but it has to be in regulated, disciplined and controlled chains now** ”.

- Developing Android apps to enable public to confidentially upload the breaches of traffic violations (including text, images, videos etc.) along with latitude/longitude of the location. The App need not be too long and complicated.
- Leveraging Internet and Android apps to report the “Road and Highway Encroachment cases” to at least 3 different authorities including Traffic Police, body of “Good Samaritan people” and Central HQ in a confidentially located area outside the District.
- Raise awareness of loss of lives and resources of the region and Nation due to the “stupid and man made deaths”
- Regular Periodic Meetings between various stakeholders like District authorities, National Highway authorities, Good Samaritans of various towns, Traffic Police authorities and Hospital authorities.
- Invest huge amount of money in saturating the roads and intersections with plethora of day and night visible signages, route illuminators, route direction markers, lat-long grid point coordinates markers etc.

- Adaptive Traffic Control Signal System for the complete district based on a coordinated plan made every day depending on the expected traffic pattern, festivals, road loading due to rallies, harvest season traffic etc. The city of Bhubaneshwar in India is already testing this methodology.
- Intelligent and Smart Traffic Management System will be required to view the complete traffic map and dynamic pattern of the complete district and get the bird’s eye view of traffic. Any snarls or bottlenecks created at junctions or road sides will be visible and the nearest traffic persons or volunteers will be cautioned/alerted/exhorted to move away so as to let traffic flowing. Mumbai has implemented this methodology successfully in synergy with World Bank.
- Faster Traffic Incident Management will be an imperative requirement. The incident prevention/correction can happen through a host of channels like FM Radio, dedicated Police Accident Helpline number, Ambulance, Insurance, media, local nominated Good Samaritan.
- Work Zone Traffic Management Plan and Execution form a very vital ingredient of District Plan. There should be clear cut directions for short-term and long-term work zones in the district. Adequate and prominently displayed signages and sign boards must be made visible across far distance for the benefit of the drivers. Road radars must be

installed at strategic places to reduce the speed of the vehicles near work zones.

- Colour coded contrast luminous painting on roads, intersections, pavements and turnings must be fully effectuated and operationalised to caution/forewarn all categories of road users including pedestrians, drivers and others.
- Since trucks are responsible for majority of accidents in Amethi District, it will be a good idea to put them in control like “a dog with leash and collar”. This can be implemented as follows:-

**Piggybacked Trucks-** All the trucks passing within the district can be made to ride as piggybacks on the rail wagons. This methodology is common in several parts of the world. The rail lines are not optimally utilized at present in the District. This implementation will take pressure off the roads.

**Escorted Trucks** – The trucks will move on the highways as per a coordinated plan. The trucks will be permitted to move only as “escorted trucks” with front vehicle being a Traffic Police or National Highways Authority vehicle. The front vehicle will be having a truncated speed limit using governor setting.

**GST Freedom Control** – The implementation of GST in India from July 2017 may have been good for business, but the inter state free movement is sending a wrong message to drivers. Since stoppages have reduced, drivers of vehicles are resorting to high overspeeding and hit and run cases are becoming more common.

- Regular Safety Audits of all bridges and roads must be carried as per a Centrally coordinated District Plan. This must be respected by all Govt agencies and contractors.
- Installation of Central Verge luminous lighting must be put on all roads and highways in the District for better guidance and navigation of drivers during night.
- Plan a move to transform to the Autonomisation and robotisation of driving with usage of communications, computer vision and other driverless technologies. The traffic collisions will get hopefully get reduced in a big way.
- Awareness Spread Campaign on bad aspects of Traffic accidents must be spread throughout the district akin to Swachh Bharat campaign. Traffic Department must play a huge role in this.

#### 10. Traffic Regulatory Authority of India

India is already having one Regulatory Authority for Telecom sector called TRAI. One more TRAI for Traffic Regulation at India level is considered very necessary. This Regulatory Authority must have offices in each of the all Districts of the Country. At Amethi this representative office will play a key role in enabling Accident free Assurance by instituting the Best Traffic Regulation and Best Traffic Management practices.

#### 4. Conclusion

India's growing economy is doing loads of good for common people in enhancing living standards of our countrymen. The boom is visible on the roads & highways with trucks, transporters & other vehicles carrying tangible goods across the length and breadth of our vast nation. But

the growing economy needs to address the collateral issues also. Accident Mitigation and Accident Prevention is of paramount importance to save the lives of our fellow brethren. The ideas outlined above are required to be studied on priority at all levels for prevention and mitigation of accidents.

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