



# SAFETY SPEAK!

Road and Traffic Safety Newsletter

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## From the Editor's Desk...

It is with great pleasure that I introduce the newest member of the JPR India team, Mr. **Greg Stadter**, who will be supporting on-site traffic accident investigation projects during his stay in India from June to November and providing his expertise to enhance our accident data collection initiatives.

Greg has been performing crash reconstructions on motor vehicle crashes with the US **National Highway Traffic Safety Administration** (NHTSA) for the last eight years and has investigated car, truck, motorcycle and pedestrian crashes. [For an overview of NHTSA statistics and their relevance to India, be sure to read "A COMPARISON OF TRAFFIC CRASHES IN INDIA AND USA" in this issue of *SafetySpeak*.] He has served as a Senior Researcher in NHTSA's **National Automotive Sampling System** (NASS) crash reconstruction system, where he performed on-scene automobile crash reconstruction and retrieval of physical evidence to determine accident configuration. For the past four years, Greg has been working at a trauma hospital — interacting directly with doctors, engineers, biomechanists, police and automotive industry experts — as part of a NHTSA program to determine how injuries are occurring in motor vehicle crashes. His rich experience also includes performing detailed crash reconstruction on motor vehicle crashes using modified NASS protocols for the **Crash Injury Research and Engineering** (CIREN) database and pedestrian crashes using modified **Pedestrian Crash Data Study** (PCDS) protocol.

A past chairman of NHTSA's CIREN Crash Committee and the author of numerous papers (including one on air bags that won the 2008 Templeton Injury Prevention award), Greg is a well-known and respected member of the traffic safety community, and JP Research is very pleased to welcome him to the company.

You may contact Greg by email at: [greg@jpresearch.com](mailto:greg@jpresearch.com), or by phone at: 97890 70013.



**Greg Stadter**

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No. of Accident Vehicles Investigated by JPR India Researchers as part of our Tamil Nadu Traffic Accident Study

## Rules You Should Know...

### Rules of the Road Regulations, 1989

#### *Rule 9: Giving Way to Traffic at Road Junction*

The driver of a motor vehicle shall, on entering a road intersection at which traffic is not being regulated, if the road entered is a main road designated as such, give way to the vehicles proceeding along that road, and in any other case give way to all traffic approaching the intersection on his right hand.

#### *Rule 10: Fire Service Vehicles and Ambulances to be Given Free Passage*

Each driver shall on the approach of a fire service vehicle or an ambulance allow it free passage by drawing to the side of the road.

-Jeya

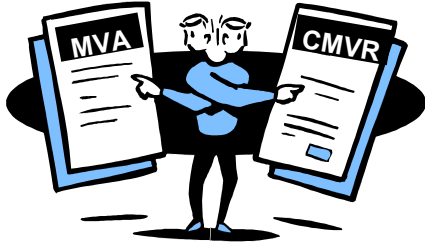
## Making Sense of India's Motoring Laws

How would you feel if you received the following message?

*"... as I have mentioned in the second paragraph of my first mail sent to you, you shall accomplish all requirements in my third mail and if in any case you do not agree with any of the conditions in the fifth mail, you are expected to call up the person whose contact number has been provided in the previous mail, preferably between 10 am to 4 pm and in no case after 5pm since..."*

Confused and annoyed? Well, this is exactly what it is like to try to read and follow the motor vehicle laws of our country.

### A LOOK AT OUR MOTOR VEHICLE LAWS



The principal instruments governing motor vehicles in India are the **Motor Vehicles Act (MVA) 1988** and **Central Motor Vehicle Rules (CMVR) 1989**.

The MVA sets laws, standards and guidelines concerning the regulation of automotive vehicles and their use. The MVA has 15 chapters and each chapter is further divided into various subdivisions, called "Sections", making up a total of 222 Sections. Sections in the MVA can be amended by the Parliament (Union Legislature), but this is a time consuming process. Thus, the MVA grants power to the central government to make rules for the purpose of putting into effect the provisions of its Sections, and as a result, we have the CMVR. The CMVR has 8 chapters consisting of 164 subdivisions, called "Rules". Rules explain the guidelines provided in Sections of the MVA. They refer to Sections in the MVA and to other Rules in CMVR itself. Rules can be amended by the appropriate office of Ministry through application of General Statutory Rules (GSR) and Statutory Orders (SO). Hence, thanks to complex cross-referencing, the confused driver must refer to both the MVA and the CMVR in order to get a complete understanding of the motor vehicle laws.

In addition, the MVA grants power to each State to make its own rules for carrying out provisions of many of the Sections. Therefore, drivers are not only responsible for knowing and following the rules of their own State, but every driver who crosses a State boundary must be aware of differences in the rules enacted by that particular State.

### WHY ARE OUR LAWS NOT UNDERSTOOD/FOLLOWED?

If you take the time to read (and untangle) our motor vehicle laws, you will find that nearly every possible aspect of motoring and road safety is addressed in them. However, it is not enough for laws simply to exist; to be effective in ensuring safe and smooth motoring on Indian roads, they must be understood and followed. Many of us do not have sufficient knowledge about these laws ourselves, and most of us would agree all too readily that "others" certainly don't follow them!

Read the Acts and Rules, and it will not be so difficult to understand why this is. Say you want to know the requirements to take the driving test for a driving license. You start off with the CMVR. Rule 15 (Driving Test) tells you how the test is conducted and what you would need to know to pass it. But say you want to know: "Where do I apply for the test?" or "What are my options if I fail the test?" — you will find no answers in the CMVR. Now you have to turn to the MVA. There is no corresponding subtitle in the MVA for the driving test. You would have to search for the answers you seek in Section 9 (Grant of Driving License), subsection (1) or (5), as the case may be. Would you really be interested in searching for your answers in this way? A system of law that requires detailed knowledge of several thick books is likely doomed to failure.

A few hurdles readers might encounter in their attempts to decipher these laws include:

- Full texts of these laws are neither freely available nor easily accessible to all. There is no single reliable source for these laws on the internet, and printed versions must be purchased at bookshops.
- The laws are written in English, which a significant percentage of the Indian population cannot read.
- Long, single-sentence paragraphs of legal language without any breaks make these laws unclear and ambiguous to the average reader.
- Numerous referrals made to different Sections and Rules within the MVA and CMVR make searching for specific information a time-consuming and tedious task.

Which brings us to the question we raised in our previous issue:

***How can people be made more aware of traffic rules and encouraged to follow them?***

UK laws are similar in structure to Indian laws; however, the UK government has created a simplified version of these complex laws in the form of an online portal. The portal may be accessed free of charge and provides a user-friendly interface, including categorization by road user type, that makes it easy for the general public to understand and follow.

**Directgov**

[www.direct.gov.uk/en/Motoring](http://www.direct.gov.uk/en/Motoring)

## Making Sense of India's Motoring Laws

(continued)

### JPR INDIA SUGGESTS...

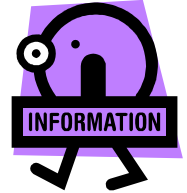


#### Improve Readability and Interpretation

Our motor vehicle laws need to be simplified to make them reader-friendly, well-structured, and concise in language. They should also be translated into all major Indian languages. Making such changes would help to promote awareness of motor vehicle laws all across the country, including rural areas.

#### One Source and Easy Accessibility

Creating a central source of information that is kept up-to-date and can be accessed easily and for free (e.g., online) would be a good start. Print copies should also be provided, ideally at no charge, during the issue of licenses and permits. JPR India has developed an example online manual for licensing as a part of a pilot project. To offer your review, please visit: <http://sites.google.com/site/saferroadsproject/Home/citizen-motorist>



#### Education, Training and Enforcement

Road users should be encouraged to learn and follow rules through proper driver training, through public ad campaigns on basic driving rules and the safety reasons behind them, and through signage at signals, intersections, truck bays and check-posts. Schools should also be encouraged to provide courses related to road safety. Traffic police should act as “teachers” and educate road users on the right ways, instead of just enforcing through fines. Also road infrastructure should be designed/laid out such that it influences road users to follow rules. (See next article.)

While these suggestions may not immediately result in perfectly lawful drivers, the fact remains that until a concerted effort is made (and maintained, even if it takes decades) to render India's motor vehicle laws readable and available, a large number of road users won't follow them. Change is definitely possible, but it has to **start** somewhere. Where better than with the laws themselves?

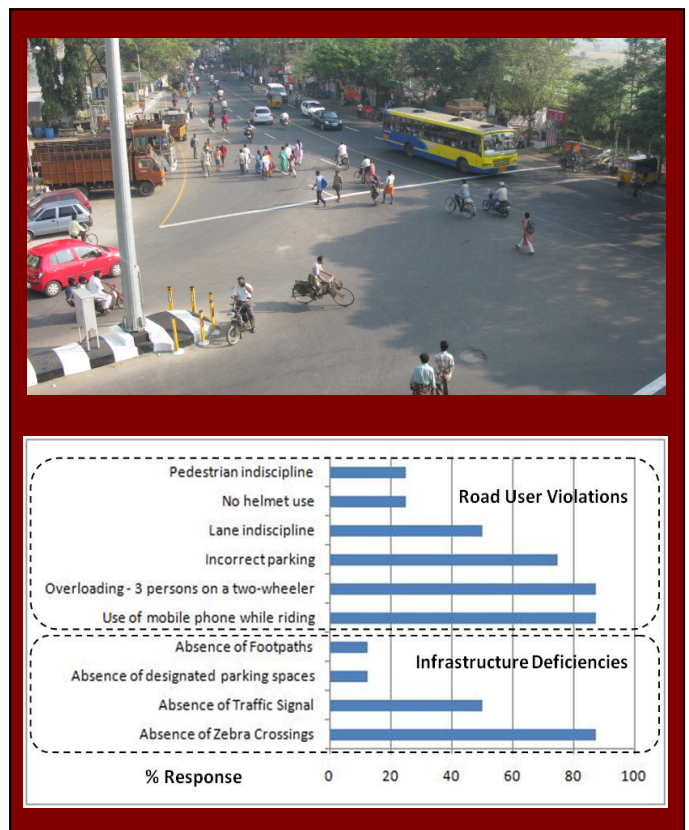
## Get Involved: Contest results!

In our previous issue we had a competition where we asked readers to find 6 “wrongs” in the picture of an intersection. We thank all our readers who responded and, as promised, the first 6 complete entries will receive a JPR India keychain torch for “Getting Involved”. There are many things wrong on the pictured intersection, which was recently resurfaced and painted with new road markings. See the box to learn what our readers found.

### INTERPRETING THE RESULTS

From the results graphed at right, it can be seen that majority of respondents noted mobile phone use, overloading (3 riders on a 2-wheeler) and absence of zebra crossings. These are followed by incorrect parking, lane indiscipline and absence of traffic signal. Many fewer respondents noted helmet use, absence of footpaths and designated parking spaces. The responses are grouped into two categories: road user violations and infrastructure deficiencies. Most responses fell into the category of road user violations.

Interestingly, the one answer we expected but never got was: “**The intersection design is flawed.**” The intersection itself is not designed to encourage road users to follow rules and travel safely on it. Unutilized and unplanned space allows for unsafe parking of vehicles. Road markings seem to be painted only for appearance as motorists cannot follow them, especially those wanting to turn right at the intersection. Pedestrians have been completely neglected here, not just by the absence of zebra crossings, but due to the large expanse of roadway to be crossed at this junction, which exposes them to fast moving traffic in many directions for a longer than normal distance and period of time. Lack of informative road signs and directions also increase the odds of unintentional violations of rules by road users. **Are we taking our road infrastructure for granted?**





## *JP Research Study helps NHTSA in Anti-Theft Rule Making*

Recently, the National Highway Transport Safety Administration published a final rule limiting requirements for parts marking on vehicles as a method to reduce theft rates. JP Research submitted a study, for NHTSA's review, that compared the effectiveness of parts marking versus use of anti-theft devices (such as engine immobilizers) in reducing theft rates. This study was conducted in 2006 for the Alliance of Automobile Manufacturers, whose members include BMW Group, Daimler Chrysler, Ford Motor Company, General Motors, Mazda, Mitsubishi Motors, Porsche, Toyota and Volkswagen. Below is a summary of the study.

### BACKGROUND

Motor vehicle theft was a growing problem in the US during the 1980s. In 1984, the US Department of Transportation (DOT) issued the Federal Motor Vehicle Theft Prevention Standard, which requires manufacturers of designated high-theft car lines to affix the vehicle identification number (VIN) or a VIN derivative onto the engine, the transmission, and twelve other major body parts. As an alternative to parts marking, manufacturers could choose to install anti-theft devices as standard equipment on a limited number of the designated lines. However, motor vehicle thefts continued to be a large problem into the 1990s and this resulted in more reviews by the US government. One of these reviews was to examine the effectiveness of the exemptions granted by the DOT for anti-theft devices (as an effective substitute for parts marking) in substantially inhibiting motor vehicle theft. A study contracted by the government in 1999 and revised in 2003 concluded that these exemptions should be eliminated; i.e., vehicles installed with anti-theft devices by manufacturers need not be given exemptions from parts marking.

### ENTER JP RESEARCH

While the government studies were underway, the Alliance of Automotive Manufacturers decided to conduct a study of its own to address the same questions. For this the Alliance contracted the services of JP Research. The JP Research team performed a series of statistical analyses to evaluate the effectiveness of the parts marking and anti-theft device approaches in inhibiting auto theft.

The primary objectives of the JP Research study were:

- To evaluate the study performed in 1999 (and updated in 2003).
- To develop a methodology to quantify any relationships between individual theft rates and vehicles with parts marking or qualifying anti-theft devices.
- To use that methodology to evaluate any existent relationships between theft rate reduction and vehicles with parts markings or qualifying anti-theft devices.

### CONCLUSIONS OF THE STUDY

The JP Research study, submitted to the Alliance in March 2006, concluded that the statistical procedures and methodology adopted in both the earlier study and its update suffered from a number of limitations and inconsistencies. More troubling: While the government-funded study found both parts marking and anti-theft devices to be effective, and its own data showed anti-theft devices to be *more* effective than parts marking, it had recommended that anti-theft exemptions be eliminated — a conclusion not supported by any analyses presented.

The JP Research study, based on comprehensive statistical analyses, found that:

- **Anti-theft devices were consistently much more effective** in reducing thefts compared to parts marking.
- Using anti-theft devices as *substitutes* for parts marking would result in an incremental benefit of **33.8% reduction** in theft rates compared to parts marking.

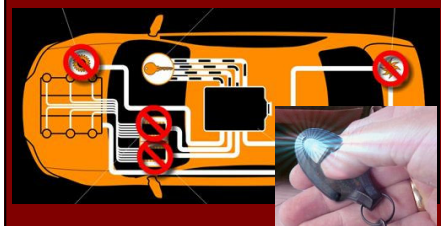
The JP Research study also separately identified 24 vehicle model lines that went from parts marking to anti-theft devices. By examining odds ratios on raw theft rates for these vehicles, the relative effectiveness of parts marking and anti-theft devices could be evaluated. The results showed that, for these vehicles, **anti-theft devices were 70% more effective than parts marking** in deterring thefts.

### AND AFTER THREE YEARS...

Based on this statistical research, the Alliance of Automobile Manufacturers put forth a recommendation to the US government. The resulting final rule on the Federal Motor Vehicle Theft Prevention Standard (effective June 24, 2009) continues the exemption of parts marking for vehicles equipped with anti-theft devices, lists no additional vehicle lines subject to parts marking, and includes "nine vehicle lines newly exempted in full".



*Parts marking can help in identifying a vehicle (or its parts) in the event that it is stolen. Popular methods for marking parts include sand blasting, electric engraving, or glass etching.*



*Engine immobilizers consist of a tiny electronic device embedded into a vehicle's ignition key. This device contains a unique and unalterable identification code and a secret encryption key. When the driver turns the ignition, the reader "looks" for the correct code in the key. If the two codes match and the appropriate security challenges are passed, the control module will start the engine. Such devices prevent use of unauthorized keys and "hot-wiring".*

## A Comparison of Traffic Crashes in India and USA

Comparing statistics on traffic crashes and fatalities in India and the United States is a useful way to determine what similarities and differences exist in road and vehicle safety between the two countries. Examination of national statistics from the Indian Ministry of Home Affairs' National Crime Records Bureau (NCRB) and the US Department of Transportation's National Highway Traffic Safety Administration (NHTSA) reveals that the two countries are very similar in some aspects in relation to traffic fatalities but that they also have very stark differences. The purpose of this article is to compare and contrast statistics from the latest year for which there is detailed data available for both countries, 2006.

### TRENDS AND INDICATORS

In the year 2006, the overall number of traffic fatalities in the US was 42,642, compared to 105,725 in India. While that difference in itself seems alarming ("Wow!" you are thinking, "We have over twice as many traffic deaths?"), the significance of these numbers depends on exposure (fatalities per number of persons in the country, or per number of vehicles on the roads, etc., as shown in the second graph and discussed below). No, the truly interesting point in the first graph is that the US saw a relatively steady number of traffic fatalities over the four years shown (42,884 traffic-related deaths in 2003, 42,836 in 2004, and 43,510 in 2005) while Indian roadways saw an annual increase in traffic fatalities over the same period (84,430 traffic-related deaths in 2003, 91,376 in 2004, and 98,254 in 2005). The dramatic increase in traffic fatalities in India can be at least partially attributed to large increases each year in the number of vehicles on the roadways in India when compared to the US.

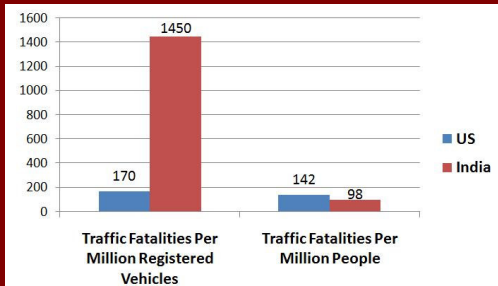
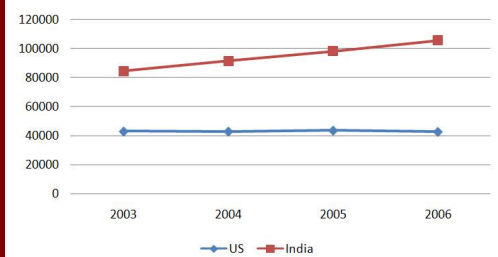
The US has a much higher rate of traffic fatalities per *population* than India does. In 2006, 142 out of every million people in the US were killed in traffic crashes, compared to only 98 out of every million in India. This can be attributed to the fact that a much higher percentage of people in the US are road users than in India. But if we examine the number of fatalities per every million *vehicles*, we find only 170 fatalities in the US compared to a staggering 1,450 in India. Although India has fewer vehicles on its roads compared to the US, it has a dramatically higher (almost tenfold) number of fatalities per registered vehicle — which is particularly bad news when you consider the number of vehicles being added each day to India's roads.

### MODES OF TRANSPORTATION

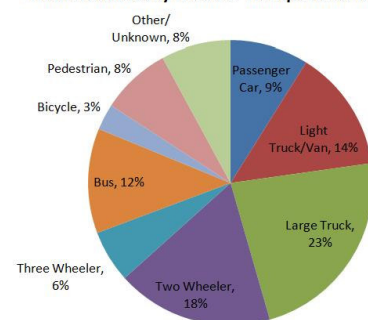
Another instructive point of comparison between India and the US is to examine the mode of transportation for persons involved in fatal crashes. Here drastic differences are apparent (see pie charts). In India, the largest number of traffic fatalities, 23%, occurred to people riding in trucks/lorries. In the US, only 2% of traffic fatalities came from people riding in trucks/lorries. In the US, the largest number of traffic fatalities occurred to people in passenger cars, accounting for 42% of all fatalities. In India, passenger cars accounted for only 9% of traffic fatalities. Another area of stark difference is in bus fatalities, which made up 12% of fatalities in India but much less than 1% in the US. Two wheelers account for 11% of fatalities in the US and 18% in India. Light trucks and vans account for 30% of fatalities in the US and 14% in India. Also, the US has very few three wheelers, so even though they account for almost 6% of fatalities in India, they do not account for any in the US.

There are, however, some areas of overlap between the US and India. For example, both countries see similar rates in bicycle crashes, accounting for 3% of fatalities in India and 2% in the US. Pedestrians account for 8% of fatalities in India and 11% in the US (although it is suspected that this is an area where Indian fatalities are underreported, given the large number of pedestrians in India when compared to the US). The differences in the vehicles involved in fatalities in the two countries reflects the different makeup of the vehicle fleets in the US and India.

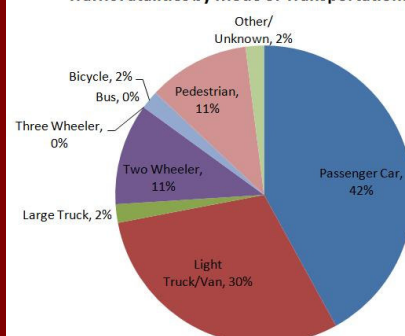
Traffic Fatalities in India and USA



Traffic Fatalities by Mode of Transportation: India



Traffic Fatalities by Mode of Transportation: USA



## *A Comparison of Traffic Crashes in India and USA* *(continued)*

### TIME AND GENDER FACTORS

The time of day that traffic crashes (not just fatalities, but all crashes) occur is another area that makes for an interesting comparison between India and the US. In 2006 in both countries, the deadliest time of day for traffic crashes was from 15:00 to 18:00, resulting in 1,461,000 crashes in the US and 62,023 in India. This is the height of the evening commute in both countries, and this is an area where the two countries are the same. Both countries also share the fact that the time of day with the fewest number of crashes is between midnight and 6:00 am, which is generally the time when there are the fewest number of vehicles on the road in both countries.

The US and India also experience similar trends in the relationship between gender and traffic fatalities. In 2006, 74% of all traffic fatalities in the US, and 84% in India, were men. Although this percentage is higher in India, the trend is the same in both countries and can be attributed to the fact that in both countries more men drive than women and more men work (and therefore commute) than women, although both of these tendencies are more pronounced in India than in the US.

### CONCLUDING THOUGHTS

Several factors could account for the different trends in traffic crashes and fatalities in India and the US. First, the numbers of vehicles on US roads is fairly stable from year to year, especially when compared to the large increase in the numbers of vehicles on the road in recent years in India. Between 2002 and 2006, the US saw a 10% increase of registered vehicles on the road. During the same time period, India saw a 19% increase. In addition, the US generally has sufficient infrastructure to accommodate the number of vehicles on its roads, while in India there are often more vehicles on the roadways than the infrastructure can handle. Also, police enforcement of traffic laws is more prevalent in the US than it is in India, encouraging more drivers to obey traffic laws. Finally, the US has higher safety standards for their vehicles (mandatory driver and passenger frontal airbags, seatbelts in every position, under-ride protection and numerous other safety requirements) than is the case in India.

Although the differences in traffic fatality trends between the US and India are stark, the reasons behind the differences are not as startling. Improvements in key traffic safety areas could easily lead to decreases in traffic fatalities in India, as they have in the US, UK, and other countries. JPR India is committed to investigating and conducting research on traffic safety issues specific to India, with the goal of reducing the numbers (and lessening the consequences) of serious/fatal crashes across this vast country in these fast-moving times. Through research and improvements in infrastructure and vehicle safety, it is certainly possible to stop — and even reverse — the upward trend in traffic deaths and injuries in India.

### *JPR India Mission Statement*

To mitigate accidents and injuries to road users in India  
by helping local automotive safety organizations,  
government agencies, and manufacturers through  
accident and safety research and training, and creating  
public awareness of automotive safety issues.

### SOURCES

1. ACCIDENTAL DEATHS AND SUICIDES IN INDIA (2006), National Crime Records Bureau (INDIA)  
<http://ncrb.nic.in/ADSI2006/home.htm>  
<http://ncrb.nic.in/ADSI2006/TABLES.htm>
2. TRAFFIC SAFETY FACTS (2006), National Highway Traffic Safety Administration (USA)  
<http://www.nhtsa.dot.gov/Pubs/TSP2006FE.PDF>

*Click on the source links to see traffic crash/accident reporting formats.*

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