



International Road Federation (India Chapter)  
4<sup>th</sup> Regional Conference

## Accident Prevention: Road Safety Measures

23-24 October 2009  
India Habitat Centre, New Delhi

### PANEL DISCUSSION

#### Accident Prevention for the Target of 50% Reduction in Fatality by 2012

**Chairman :** K. K. Kapila, Vice Chairman, IRF & CMD, ICT

**Panelist :** Mr. Said Dahdah (WB), Mr. Nirmal Jit Singh (MoRTH), Mr. Tony Pearce (IRF), Dr. Allan Ross (UK), Mr. Mamoru Tanaka (JICA), Dr. Rohit Baluja (IRTE), Mr. Manoj Dave (L&T), Mr. Sudhir Hoshing (Reliance), Prof. Dinesh Mohan (IIT Delhi)

#### Opening Remarks by Chairman Mr. K. K. Kapila



Good afternoon friends.

After two days of extensive deliberations on “Accident Prevention: Road Safety Measures”, we are now on the last part of this Conference. We have had excellent presentations. You have all heard them and admired them and I must complement them for doing an excellent job. The task before this panel is to come out with clear and specific recommendations,

which are implementable and can be addressed with interventions from the Government, the stakeholders and all of us present here, so that we achieve the ultimate target of reduction of road fatalities by 50% by 2012. Some of my friends sitting here have been saying this is an impossible task, and says that the time to achieve this target should be different. But I believe we are capable of doing the impossible and we will prove to the world that we can do it. I believe that word impossible does not exist. It is our own determination and desire to do it as a mission. If we can eradicate polio, if we can solve other problems, we can solve this also and I am very happy to say that we have the Government support. Hon'ble Minister Mr. Kamal Nath Ji was here for the launch of this campaign. This campaign was launched by him and the kind of support we have been getting in the last one month from the Government, by taking up various issues with various Secretaries of the Government Departments, I am convinced that it is an achievable target and we will achieve it. With these opening remarks, I will now request my panel to come out with recommendations which they feel would help us to achieve this target.

**Mr. Said Dahdah, World Bank**



I have a quick comment about the target. If it is aligned with the decade of actions, it is 2020 and not 2012. This is No.1. Because there will be now announcement in the Moscow Ministerial Conference for the decade of action which is 2020. But putting that aside, I think the target is definitely ambitious but as Mr. Kapila said, we don't say it is not possible, we should try to do it and we will be able to do it. From the World Bank perspective, it is again a very ambitious target, but the way we see it in India as well as in other countries, there is only one way to do this ambitious target in 10 years. I am talking about just short period and the only way to have the biggest reduction in road fatalities. From now until 2020 it is to be by fixing the road infrastructure, so again the quickest gain is going to come from infrastructure in the shortest time. The change in behavior aspect can be achieved in longer term, but for the shorter term it is only the infrastructure that can solve your problem. By infrastructure I do not mean running all these road safety inspection; because the road safety inspections and audits are not going to solve the problems. We know that about 2500 kilometers of roads of national highways has been audited, but the auditor's recommendations have not been implemented. Because India is moving very fast in building the road infrastructure and is moving from one configuration to another, and therefore, most probably road safety inspection is going to be waste of time and waste of resources. The problem to fix that is to fix the type of infrastructure we are putting, and the very important

issue to talk about is the functionality of these roads. We are building those highways but they are really not functioning as highways because the pedestrian walking on them. So you need to rethink about the functionality. Rethink about the introduction of Expressway system, and unless we start introducing access controlled expressway, keeping the other roads for low speed and for the pedestrians. Whenever we need to have high speed, it should be access controlled. Unless we get into that, all the four laning or six laning of the highways are going to unfortunately to be killing people. And again running small audits and inspections are not going to solve the problem because audits are going to spot hazardous locations here and there; the problem is much beyond those hazardous locations. The problem is in to the functionality and the designs of these roads. Together again we should target that 5 to 10% of our highways which are killing the majority of the road accident victims. We do not have to solve the whole network, we have three million kilometer of roads, we need to find those 10% which are killing majority and take up the task of building standard according to the situation. Here again, we don't need to get standards from abroad for building roads here as they may not work here. We need to develop good standards for the local conditions here and the Indian Government is able to do that. There is no problem in capacity in doing that but we need the will, the leadership and the political will to stop building those killer roads, and to shift to appropriate designs whenever possible.

**Dr. Rohit Baluja, IRTE**



I think my friend Prof. Dinesh Mohan mentioned something very important which is that we have not given respect to research, indigenous research. We are cut-pasting things; there are research results everywhere across the world, but we need to give absolute importance to indigenous research. When we present the researches to the Government, to the bureaucrats and politicians to evaluate and adopt, who do not have the understanding of such research, these researches are not taken into consideration. Fresh investigation has to be the as one of the most important beginning towards understanding of the problems that are faced on the roads today. Our standards on traffic control devices are lacking, standard on road geometries are old. We have the standard on road signals as old as 1986 and we are just doing whatever we want to do; and therefore, we need to build these standards, and not just copy the American or British standards. It has to be based on research. Legislation itself today has actually fallen short of what is required, enforcement is totally handicapped as we have not defined legislation properly. The rules of road regulation of 1989 are not

helping us at all in our enforcement procedures. We have to ratify our legislation and standards to the UN Conventions (The Convention of Road Traffic and Convention of Road Sign and Signals) to make it uniform across the country and this is what the United Nations has been repeatedly telling us. We have noticed that the state highways and national highways are killing 65% of the 115,000 people and as my friend Mr. Said from WB just said that it is the understanding of the problem, which is important. If we see the graph of accidents, it goes up steeply when the construction takes place as many people are killed. I would recommend that non-bailable penal action section should be considered for those who's negligence causes accident and death whether in construction or in design.

**Mr. Manoj Dave, L&T**



I would like to share a bit of experience that we have got during the last few years. L&T has operational roads in various states of the country, and some of the sample statistics show that about 1000 accidents and most of them, as somebody mentioned earlier in the technical session, are attributed to the driver negligence. Now part of it is true and part of it is not, but the fact is that most of these accidents occur because the trucks are driving on the wrong side of the road. There are delineators and markers which are installed on the road when it is built, but these get stolen. There is no enforcement at all. We talk about enforcing during the construction, but the fact is that enforcement is grossly missing, and therefore, in case of PPP Model, where the concession companies are operating these roads, there has to be some enforcement rights given to the BOT operator. There is nothing that the operator can do, he can stop the truck but will not have authority to impose penalty for parking on the shoulders or driving on the wrong side. Secondly, I feel that in highway traffic management system or advance traffic management system, as it is called, we have been investing lots of money in emergency call boxes and some other equipment like advance traffic counters and classifier which calls for huge investment. Our own internal statistics say that 98-99% of the calls from ECBs that comes to the control room, they are either children playing with the phones or somebody just trying to find that whether it works or not. There are very few calls which are actually useful in terms of getting the information that there is an accident on the road, and therefore, you could send some support in the form of ambulance or a crane or whatever. So the other very reason why we don't get call through the emergency call boxes is because now most of the people use cell phones so they don't stop to make a call through an emergency call box. Therefore, these investments will be useful if we can put them in identifying the black spot and may be lighting up the black spots or putting in more cameras



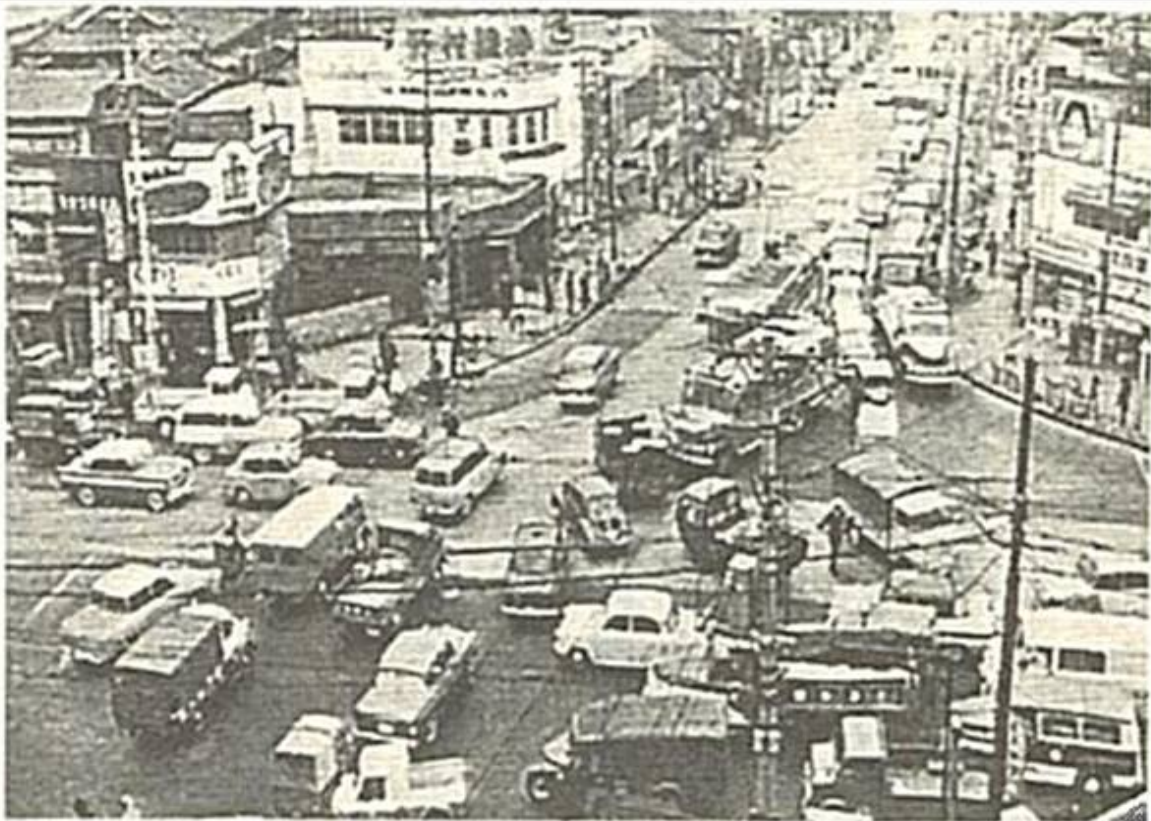
out there, so that we can also gather some data, some information to analyze the accidents at a later date. Primarily I think these two of them put together plus with some stringent norms defined in the concession agreement itself, number of route patrol should be carried out in a day like now it is very vague situation, the agreement do not define the number of patrols that you need to do, the frequency and the speed at which it should be done and what should be their objective and so on. So these measures put together, I think, it should be able to reduce some accidents. We actually are pained because in the last 6 months alone we have seen about 49 deaths on the roads operated by L&T, which is very serious and appropriate actions are required to be taken to ameliorate this.

**Mr. Mamoru Tanaka, JICA**



Today's theme of discussion is to achieve accident prevention and for the target of reduction of fatalities by 50% by year 2012. As I am working in close coordination with the Ministry of Road transport & Highways, my task shall be to encourage the Ministry to achieve this target. And first, I want to emphasize that Japan is an Asian country, and Japan started from scratch for developing highways after world war-II and look at this picture. Some of you may feel this is Connaught Place of Delhi, but actually this is Tokyo, this is the picture of Tokyo in 1950. So Japan experienced the same traffic level of accidents as in India at present, and Japan has succeeded to reduce to half with the safest highway system in the world. So I want to say that India can also achieve this target. However, I have to say that through Japanese experience, India is now in the most difficult stage in terms of motorization. I will explain this by using Japanese history of traffic accident. So, this shows the motorization in Japan by registration of vehicle population per capita and its composition. Thus, motorization started in Japan in 1950 and it continues until now. The question is where India now in this graph. So, motorization of India can be assumed as that of Japan in early sixties, because India has high percentage of two wheelers and very low 4-wheeled vehicle per capita. I think now you have 80 vehicles for 1000 people and there is very high increase in GDP per capita, which exceeded US \$ 1000 last year, which Japan experienced in 1966. This slide shows traffic accident in Japan over the years and also the corresponding fatality. Thus, until 1970's, fatality increased much faster than vehicle population purely due to few highways infrastructure, lack of safety facility and insufficient police enforcement, almost same situation as in India now. Then Japanese Government did set up national safety plan to carryout a comprehensive safety measures, and started strong initiatives and succeeded to decrease the fatality by 50% in 10 years. Thus, whenever there was the increased trend observed, again strong Government actions were taken up, and we achieved 50% reduction

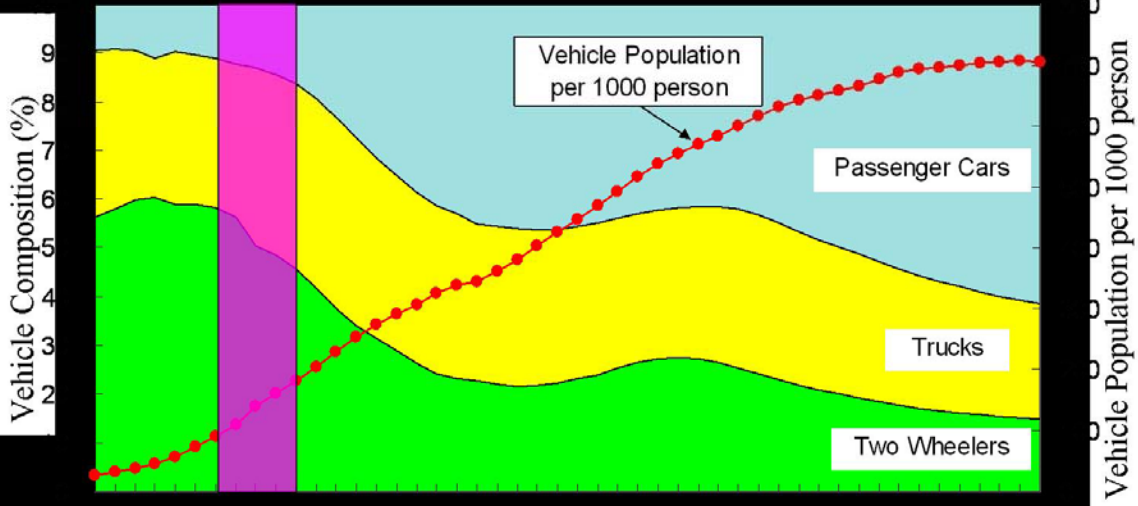
again. So actually we achieved 50 percent two times but it took about 10 years. However, traffic accidents have increased again in proportion to population. Therefore, the Japanese Government had started to implement ITS for road safety by using information on human loss and vehicle which was explained in the afternoon technical session by Dr. Fujino in his presentation. Now let us look at Indian scenario. The graph 1 explained the motorization of India at this stage. And thus it is very clear that you will have very steep increased of fatalities, but I also want to say 50% reduction is not a dream for India, as I see from the Japanese experience. Please note that the worst situation has not come yet in India's safety situation. Therefore, immediate and strong Government actions are the only ways to achieve this target. The suggested actions which have been discussed by other speakers during this conference are to be implemented, like National Policy Programme for road safety, capacity development including planned enforcement and education, counter measures based on accident data analysis. Also, I just want to say that it is the time to develop National Expressway Network, because fully access controlled expressway is the safest type of road with highest speed and mobility.



# Motorization in JAPAN

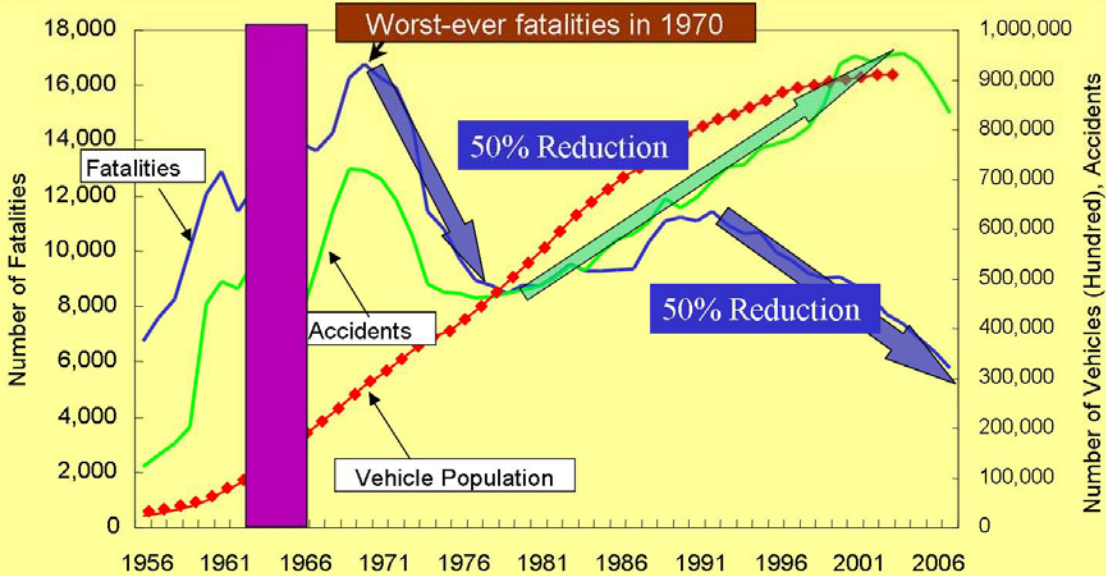
Motorization stage of India can be assumed as that of Japan in early 1960s

- High percentage of Two Wheelers
- Low Vehicle Population per capita with rapid increase (over 10%)
- GDP per capita exceeds \$1000



# Transition in Traffic Accidents in JAPAN

- Until 1970, Fatalities increased much faster than vehicle population
- Government strong initiative succeeded to decrease fatalities
- However traffic accidents has been increasing





## Suggestions to India from Japanese Experience

Worst has not come yet in India. Immediate strong Government actions are the only way to achieve this target.

1. National Policy and Plan for Road Safety  
(Similar to NHDP)
2. Capacity Development for Road Safety  
(Fund, Enforcement, Education etc.)
3. Countermeasures based on accident data analysis  
(Countries have their own characteristic of traffic accidents)
4. Fully-Access controlled Expressway  
(Safest types of Roads with highest mobility)



**Mr. Sudhir Hoshing, Reliance Industries Ltd.**



While travelling from Gurgaon to this place, I had to cross the Toll Plaza. My driver went to ETC lane. I asked him why he did not go to the cash lane, and his reply was that he does not read signs. What does he see if he does not see the signs ? If people do not see sign boards, is there anything left to be done. If I am not very wrong, 60-65% of vehicle drivers are not educated. So we have the problem there. Even if you provide best of the signs, there is nobody to read those. So education becomes the most important thing, as you were saying, we have to have curriculum in school for this. I do not if our literacy level has gone beyond 50% when entire population is put together. The problem starts from there. The second thing is the implementation of the NHAI's four laning projects, as Mr. Dave mentioned, as soon as four laning work is completed and the road is opened for traffic, accidents have increased. I have also seen it happening. So the problem is there, people actually don't know how to cross, and they cross the 4-laned road as they want simply through the median.

I am from Mumbai and I have seen western express highway which is 8 lane road. People try to cross there without any intersection, without any zebra crossing, even just below the foot over bridge. I had to brake for such a situation and my car was hit from back. I am not a safety expert, but I feel you know that large number of such accidents occur because of engineering lapses. 99% of the accidents are probably due to the reasons of lack of education and non-implementation of law. Often laws are there, for example, somebody coming from the wrong side of the road. If I want to apprehend him for this, I don't have any enforcement law. Still I can talk to people, I take photograph, give it to the police, all that is done from my side. Thus, education and enforcement of law is very important; it cannot be solved by NHAI or Ministry or any other organization, the change is required in everybody. Safety is for aimed for everyone.

With allocation of more money, the roads probably can be made safer; for example, to provide service roads for large length additional resources are required. Even if you provide all these, and even the items of HTMS along the project highway been implemented to have the safe journey, who is going to read all these VMSs. Probably no one will read the VMSs, rather somebody may be found actually crossing the road under the VMS. So, my recommendation is to ensure education and about implementation of the law.



This is enormously generous country. In the last 30 years I have been invited to about 400 such meetings and most of the people who invite me, actually do not believe that what I say. So I am really thankful that people still invite me for entertainment. So my only job here to entertain you because facts don't matter, science does not matter, nothing does matter, I am here to entertain. Other people will provide you with facts.

The problem is that all of us are behaving like human beings for the last 5000 years who wanted to treat for sprain of the ankle. For 5000 years, to treat a sprain of the ankle, in all the societies, we did put a warm compress or warm atta or haldi, because it felt good. And, therefore, the international human experience was that if you massage the ankle after a sprain and if you put some warm thing around it, that is very good because it was felt nice. But the sprain got worse for all those 5000 years. It is only in the last 30 years some scientist discovered that when you get sprain, some capillary break in that region, and there is leakage of blood, and large molecule protein collects there. There is consequent swelling of the ankle and also the blood clots, for which all of us were advised to rest after sprain because that feels good. But when you rest, your internal bleeding and swelling do not stop, and your ankle becomes worst and you never walk properly again. But much later we discovered that if you want the sprain to heal by scientific method, you have to stop the capillary from bleeding and the only way to stop capillaries from bleeding is to make that area very cold for which we put ice. And when this was told to doctors, a majority of the doctors laughed and they kept treating sprain with hot compressed and massage. It is only when a few patients started saying that their sprain got much better because they used ice and cold water which was opposite of the people's common knowledge, that our sprain started getting better.

Now in road safety, it is the situation where we still want to use hot compress because no one in the Government and none of the NGOs wants to believe what we have known for at least 30 years. I can tell you quite honestly that the science of road safety is about the same as what Bill Hadden taught me 30 years ago theoretically. We have known many things from this 30 years, but we refused to accept what is known scientifically because the hot compress feels better. I think there is very serious problem, because unless we change from the hot compress to ice on the ankle, the sprain will not get better.

We talk about punishment to traffic offenders and want to increase fines. I have a news for you. In India we have the most sever punishment and the quickest judgment on punishment in comparison to any western country. If I hit someone- a pedestrian or bicyclist, I cannot stop there and I must escape as we have the very quick judgment to say that I am at fault.

They will burn my car and they will beat me up. No western country has such severe punishment and so quickly. We tend to refuse this evidence from our own country that severe punishment does not work, otherwise our death rate should have come down long back. The people get beaten up and they have to run for their lives if they have a crash, but you will still find in some papers that road users in India are horrible and as if we should import Germans into India. We can work only with the people and politicians we have here, and there is no other solution. Therefore, I would say that we can do 5 things within 2 years which will reduce death as per my estimates by about 10,000.

The first one is that the States have to be convinced to enforce the helmet law and it is very easy to enforce. Corruption is not an issue because I as a road user don't care where money goes whether it goes to a policeman's pocket or the Government. The helmet law works because I don't want to pay the bribe to the policeman as I am not interest in corruption. In this case, the corruption is very good for road safety, because the policeman will enforce the law, if he is good policeman who wants to maximize his income. Therefore, we have to have rules and when they are enforceable, the police will enforce it. The seat belt used in Delhi during day time is about 80% which is pretty good. Helmet use in the day time is about 90% which is also very good. Therefore, the helmet should be enforced as far as possible and the Government will have to think how to convince the State. Enforcement of helmet law is the State subject, and I am glad that it is a state subject, because India is not like a small European country, but it is actually like the European Union, and we have to behave like the European Union where the States are independent.

Secondly, we can make all two wheelers to keep the head light on during the day time, which can be done tomorrow. That will save may be 3000-5000 deaths a year with no cost to the Government, and it very easily enforceable because the policeman can see from a distance. The perception of the drivers of getting caught is very high, and when daytime headlights are compulsory, we know from international experience that night time accidents will also go down for motor cycles. This is because every two wheeler drivers knows that when bulb is fused, he cannot delay it in getting fixed, and this there will be no motor cycle without headlights at night.

Thirdly, at present the pedestrians have no place to walk, there is only one road in Delhi where you can walk safely, which is the Bus Rapid Transit corridor. When I walk along a road, I do not walk on the footpath, and I walk on the main carriageway because the footpath goes up and down and it is very high. I have a bad ankle, and therefore, I cannot use the footpath at all. Thus even if I am educated I will not use the footpath in any city of the country. If I want a smooth surface, and a level surface to walk on, I have to walk on the main road. I cannot cross at the junction because we allow free left turns in traffic signals, and the police insisted for the last 30 years that we must have free left turns. If there is free left turn, there is no time when the pedestrian can use the zebra crossing because traffic is moving continuously. Thus, all free left turns should be banned in the cities if you want people to use the zebra crossing. I do not use zebra crossing because it is the most difficult place to cross. I go 50 meter upstream and cross mid-block because it is easier to cross there, and it is not that I do not know the laws, and I know little about the road safety also, but I have to violate all the rules because the police and the PWD engineers do not allow me to do what I want to do safely.

Fourthly, in case of intercity roads, all roads passing through villages and townships must have speed breakers every 80 meters. Otherwise, people will drive at high speed through every such location, and thousands of these villages and townships of India are passed through by these roads.

The fifth recommendation is that all bicycles should be painted yellow. This will not harm anyone in terms of price, and the price of the bicycle also will not go up. We will save lives without any drain on the exchequer. So these were the five points which can be done within 2 years.

In the longer term, we have to review all our highway designs. At present our highway designs are such that it causes accidents and kill people. Actually I have lost 5 relatives in



the last 10 years because of bad design. Two nephews, one uncle have died within the last 2 years. And now I have decided that next time my relative dies, I am going to file a court case against the Government of India for criminal neglect amounting to murder because they are making designs knowingly which will kill people and that is criminal neglect because they are violating all safety norms of the road designing.

It may be remembered that, you cannot have things done properly when people do not know what is proper. There is not a single Civil Engineering Department in this country, including my own institute, where there is a course on road safety which is compulsory for Civil Engineers. It is optional where it exists. In all the Masters in Traffic Engineering courses also there is no compulsory course on road safety. So if you do not have anyone who is trained in the subject, I do not care how many NGOs you have, I do not care how many nice people you have in the country, when you don't know about putting ice on the ankle, you keep putting hot water. Therefore, we have to say that all Civil Engineering Departments must have a course on road safety which is compulsory for all students because Civil Engineers in this country, by and large are following policies which were discredited 30 years ago. Then I would say that the Government should recognize within the next 5 years atleast 10 Departments in IITs and NITs as special centres for research for road safety. Because you cannot do research unless there are students who are doing Masters and Ph.D.s. There cannot be research unless you have a very good library, and you have to have an atmosphere for research where I may be only 3 people in Civil Engineering Department. For doing good research, we need another 50-100 other professors across the globe who give me knowledge and materials through various means. People cannot do research anywhere in isolated way and alone. Good research is done in large institutions and using the international experiences. No small group does a good research unless they are associated with a very large group in a university or research institutions. Therefore, I would suggest that there should a grant of 100 crores for such research centres, say 10 crores each to 10 Departments, which is not very much at all. The Government can identify 4-5 IITs and 4-5 NITs for this task, and we will be going forward. It is just the cost of one flyover in one city.

I think there should be definite programme of road safety through the Government. There is no point introducing any M.Tech. or Ph.D. programmes unless they have a jobs, and good people do not like temporary jobs, especially in India because we lead a hard life. I do not want jobs only with the contractors, I want permanent jobs for researchers in institutions and Government Departments, so that they have a career to look forward to. Therefore, I would say that there should be directive that within 5 to 10 years, we must have one professional M.Tech. or Ph.D. in road safety for every 500 kilometers of national highway and they should be distributed to NHAI or all the PWDs. It should be made compulsory that every PWD and NHAI office must hire a minimum number of M.Tech.s and Ph.D.s who are trained in road safety so that we have 500 professionals within the next 10 years, as you cannot produce professionals very quickly. And finally, I would like to say that if I am going to retire next year, I am supposed to get a pension; and people tell me to put my money where my mouth is. I will really put my money where my mouth is. If your school education of children, driver training and stricter licensing reduces the death rates in India, I would stop taking my pension.

**Mr. Tony Pearce, IRF**



My comments are in two groups. One is discussing the basics, trying to get the basics right and the other is with some specific observations. Now in terms of the basics we have had from the World Bank and others that it is important to get your legislation and enforcement right. Now from what I have seen, legislation is not that wrong but the enforcement is singularly lacking. It is important to get your standard right. Now IRC standards are fine, but the problem is that they are just simply not used. Driving through the country, you see that road signs have no relationship to the IRC standards. The third thing which is hugely important is getting people talking to each other. Co-ordination is hugely important. The Sundar Committee report needs to be implemented. I know people told me that road safety is not in national competence, and it is a state subject, but basically what you have to do is to get police and people have at least the education. And, the transport people, all talking about road safety and actually focusing on more things to be done right, and for that you get policies which are culturally relevant to India. That will focus the statistics, and the right way ahead. Traffic engineering is hugely important, trying to educate people to understand what they need to do, and the road is to be speaking to them that will be right way to get people not to exceed speed limits not to exceed safe speed and to actually get people to drive much more safely. Education and training is hugely important. Now, I know Prof. Dinesh Mohan will tell me that every example in the world of educating children tends to produce more chance fatality, and that it is counter productive, but I really do feel that it hugely important to try to educate children about road safety as part of the normal curriculum, and not necessarily parachuting in policeman once a year, and that actually people to understand road safety as part of normal life. Then, of course, research and development. Now, a few specific things are going to make a difference. In case of helmets, Vietnam has shown the way how to introduce helmet for motor cyclists, not just the guy on the front but family at the back as well, and has made a big impact not only in helmet wearing. I was in Vietnam some time back, and there helmet has become compulsory the day before. I did the survey, and 15% persons in Ho Chi Minh city were wearing helmets before and 98% were wearing helmets after that day. They are wearing helmet as fashion accessories, even when they didn't need to and that is what I think going to make huge difference, and I am sure that Dinesh, Rohit and others will tell me how much difference. I think wearing the seat belt is also far too little in this country. I have not done a survey but I suspect that majority of the people don't wear seat belts. And people who involved in crashes, who were not wearing seat belts are at much greater risk of death and injury. So doing something about seat belt is important. In every case controlling speeding either through road engineering or through

enforcement is going to be hugely important. The fast cars must not come into contact with pedestrians or bicycles. But, we have crazy situations, like if you drive round the city, you will see that engineering has been done in the last year in putting but stops in the middle of the road, where pedestrians have to cross 2 or 3 lanes in order to get to the side of the road. This is very risky. We need bridges and we need over passes (FOBs) in villages to stop ordinary pedestrians actually crossing high speed roads. Now much has been done for high speed roads, but the fact that 30% or so of the fatalities and injuries have on national highways which is only 2% of the total road network, and as I recall 80% of the traffic on the national highways is supposed to be the safest. As Mr. Tanaka has mentioned, fully access controlled highways are the safest roads. In France the safest roads are the high speed roads. They don't allow pedestrians, cows, bullock carts, bicycles to walk around to the roads. Also the Chinese experience for the last 10-15 years has been that they have been introducing more high speed roads, Motorways, and the programme is to built 80,000 Kilometers of Motorways. What has happened is that the number of accidents have gone down. The severity of accidents has increased; more people are hurt when there is an accident. And so, we need to ensure that passenger vehicles protect drivers as well as occupants. I was encouraged to hear when Dinesh had said that India has the youngest car fleet. So some road infrastructure needs fixing at national highways, and you got examples of things which can really be done and which need to be sorted out. I like to pick up the point Mr. Manoj Dave said about PPP model. In many countries where there is Public Private Partnership operating road, what happens is that the national authorities decides on certain standards to be delivered. Standards in terms of the road quality and safety are delivered and what happens is that the whole road is monitored on camera. And the cameras feed to a police station next door, where highway police is able to carry out enforcement from the video logging. Law exists to enable enforcement to be done on the basis of video recordings. And so driving behavior improved and the whole road becomes considerably safer. It is also logical that the operator of the road should not be burdened with enforcement for overloaded vehicles, and as engineers, we know to have damaging effect on the road. What has happened in this country is that of excellent highway projects in Rajasthan; there are emergency services provide in Tamilnadu roads and the victims are given medical attention very rapidly, certainly within 30 minutes and absolutely within golden hour. I have given quite a shopping list for attaining road safety.





India is very fortunate actually that you have enormously large number of well educated people speaking English which means you have access to information from worldwide through internet, which is not the capabilities available in many countries. The people are there, you have world class advocates, Prof. Dinesh Mohan, Dr. Balulja and Dr. Gururaj and others in the country. I am totally in agreement with Dinesh in one respect certainly that one of the biggest that you can do to invest in road safety, in institutional development meaning the manpower, this is a biggest resource you have but you need to have many thousands. I think in an earlier discussion I have said that the ratio of something like one safety professional for 5000 population. In places like Victoria in Australia, who have been active and doing lot of good safety work, have large number of professionals in road safety. There may be researchers, there may be education people, engineers, may be medical people; as I said Victoria with 5 million people has about 1000 road safety professionals. Thus, the point again is that we need to develop road safety professionals, with job opportunities of them for working in the Ministries. You need to mobilize the youth, you have got a young population as of one of our earlier speaker said. It will a tremendous impact if they can get involved in road safety initiatives of the country from the universities, and Dinesh said about training the young engineers so that they come up with basic safety concepts and they will be the ones who will drive it forward in 5-10 years. Thirdly, you are the people here in this audience, the contractors and consultants building the road network of your country, which is going to last for 200 years. I said this morning that you have a responsibility, we cannot put our hands up and say as an engineers that we are doing no harm. But, may be because of lack of knowledge or may be other reasons whatsoever accidents are taking place, but our roads have to be more forgiving. The fact that we do not have enough enforcement or we do not have good driving behavior, does not take away the responsibility, they are our roads, whether you are a contractor or consultant or a ministry official. Referring to a problem I suggested in the morning that even if the Government does not require a safety audit, may be Indian Chapter of IRF can do it. Even if the World Bank does not require it, as a consultant I would make sure that out of the 200-300 man-month to design the road, about 3 man-months may be put in road safety audit. I will audit my own design irrespective of anybody's requirement. I think you need to do it, and demonstrate a leadership to rest of the consultancy and contracting industry for building safe roads, which are dreadful now and killing people as well as much worse than many other countries. Like India others also have problems, for example, China has also dreadful roads in some areas. Therefore, I think as an Industry you have an obligation and I think you have the opportunity. The earlier speaker also said the situation is going to get much worse for the next 10 years. Therefore, we better

concentrate now before it gets un-manageable. The roads you are building today will be with you for 200 years. The network in most of the western countries have already been built and we will have to go back to do the corrections to them to try to make more meaningful for venerable roads users and the humans. We can do that now as you build the system. So I would certainly advocate two things, one is to see that road safety is not a cost, you are going to loose 25% of your health budget for treating traffic accident victims in 2020. The Government should be talking at the highest level, not just at Ministry level, the money can perhaps be saved and transferred for road safety. It is economic issue for the country, 3% of the GDP has to be an economic decision, it is worth investing a part of it. But I would say do not keep blaming the police, do not blame the poor pedestrian and other people as we said before. We have to provide barrier, railings for warning people; engineers have to attend to these requirements without fail. I would strongly advocate that you take on the responsibility, and I think it the fantastic opportunity available to the industry. I am a road engineer, and I would love to stand up with pride that we are doing our bit to help make the pedestrian safer.

### **Mr. Nirmal Jit Singh, MoRTH**



Almost one third of the fatalities is on national highways and another about 30% on state highways, and so we need to focus on these two categories of roads if we really want to make a dent in our road safety situations. On national highways, for the last 7-8 years we have been going through a big programme of four laning and, six laning. Though by designing these roads as part of GQ or subsequently North-South and East-West corridors, lot of safety provisions are added such as flyovers, pedestrian and animal crossing, wayside amenities, lay byes, retro-fictive signs, marking, delineator, crash barriers, etc. But still somehow there is perception that these are not adequate. Especially the crossing facilities for the pedestrians and animals and even for vehicular crossings for minor roads when they are crossing the national highways, are considered to be not adequate. As I mentioned yesterday, on an average every 10 km there is an underpass or flyovers, and in N-S/E-W corridors every 4-5 kilometers. Subsequently, in some of the projects taken up later, more facilities have been provided. But with these four lane highways and new generation vehicles, speeds have increased tremendously, and unfortunately it has led to more accidents. Another point is that regarding the provisions of service roads. In fact when I was in National Highways Authority of India, we have covered almost 25% of the length by at least one service road in North –South and East- West corridors. When we took up projects of six laning, we have provided continuous service roads for the entire length, I think we took all 5 projects of 882 kms with continuous 2-lane service roads throughout the length on

either side. Subsequently, for the last couple of years, somehow there has been a feeling that with these kind of provisions, the projects are becoming unviable. There is a lot of talk that you have to reduce or avoid the flyovers and pedestrian over passes and underpasses, and certain length of service roads to make the projects viable. Now you have to take a call that you want to have viable highways or you want to make safe highways.

The Government is now interested to take more and more projects on BOT (toll based); but if the projects are not viable on BOT, we should be prepared to do it on annuity or EPC, but we should not be compromising safety and cut down on the safety features to reduce the cost. I think that needs a serious attention of all policy makers whosoever may be concerned with decision making. The other thing is that all large size projects costing more than Rs. 500 crores, are required to go through a committee PP-Partnership Appraisal Committee for appraisal. At that point of time, while putting up those proposals, I think we should also accompany that with the safety audit of design, which will clearly indicate these requirements. I do not think anybody in the Government will have the courage to cut down any of the safety features consciously and then take the responsibility of cutting down the cost by removing the safety features. I think we should highlight the safety features, which are required without any compromise. If you want to build the high speed highways, these must be there, otherwise let us not built the highways. The other thing is that especially when you are building 6 lane highways, it is virtually impossible for any pedestrian to cross 6 lane highways; even the slow moving cyclist and other modes also can no way cross it, and crossing is simply not possible. Such traffic will meet with accidents as they can not perceive the correct distance from which the traffic is coming and get killed. Thus, I am sure that either we make the highways only 4-lane highways and keep adequate width of service roads on both sides for the local traffic. However, if we want to make six lane highways, we must have service roads on either side, and more and more crossing facility shall be a must.

The other point I want to make is that after building the 4 lane and 6 lane highways, head-on collusion have come down. But there is large number of rear end collusions that are taking place, mainly at night at many places when the trucks are parked on the shoulders or on the carriage way. In the dark the drivers are not able to see the parked vehicles and there is no reflectorised tape provided behind the parked vehicles and people are just ramming into a stationary truck or other vehicle. Even on Delhi-Gurgaon highway, rear end collusions have happened when the lights were not working. So we must make it mandatory that there is light or reflective tape at the rear of the vehicles. These are not only required for slow moving vehicles, but also on trucks, buses all over the country so that the following vehicles can take precautionary action. And of course wherever our national highways are two lane or single lane highways and are passing through villages, I think as Prof. Dinesh Mohan has also mentioned that we should definitely take some traffic calming measures. We must try to reduce the speed drastically. In fact we got a study done by Prof. Dinesh Mohan's group only about 10 years ago and some guidelines were prepared about what kind of traffic calming measures should be provided in such situations. Unfortunately, many of those are not being implemented. In fact about 15 years ago we got the accident reporting format modified, but somehow in the Government working, many a time these do not get implemented because of various reasons. At the cost of repetition I would like to mention that when one travels on our 4 lane highways, it is common sight that you find a tractor or a motor cyclist or a bullock cart, or even a truck coming from the wrong side, when you are traveling at a speed of 80 or 90 kmph. Though we are providing the median openings almost every 2 kilometers, just to go to a wayside amenity like a Petrol Pump or a Dhaba, people do not want to take 500 or 700 meter extra travel and they travel from wrong side. A good road is provided with median openings every 2 kilometer, which of course, cannot be provided every half a kilometer as certain minimum distance is required to be kept. But ultimately it come to public apathy to comply to road rules, they simply do not care for the traffic rules, they do not care about driving behavior, I do not know what a highway engineer can do in that situation.

Another issue is the problem of overloading, though it has been mentioned in number of places earlier also. This is a serious problem and a large number of accidents are also

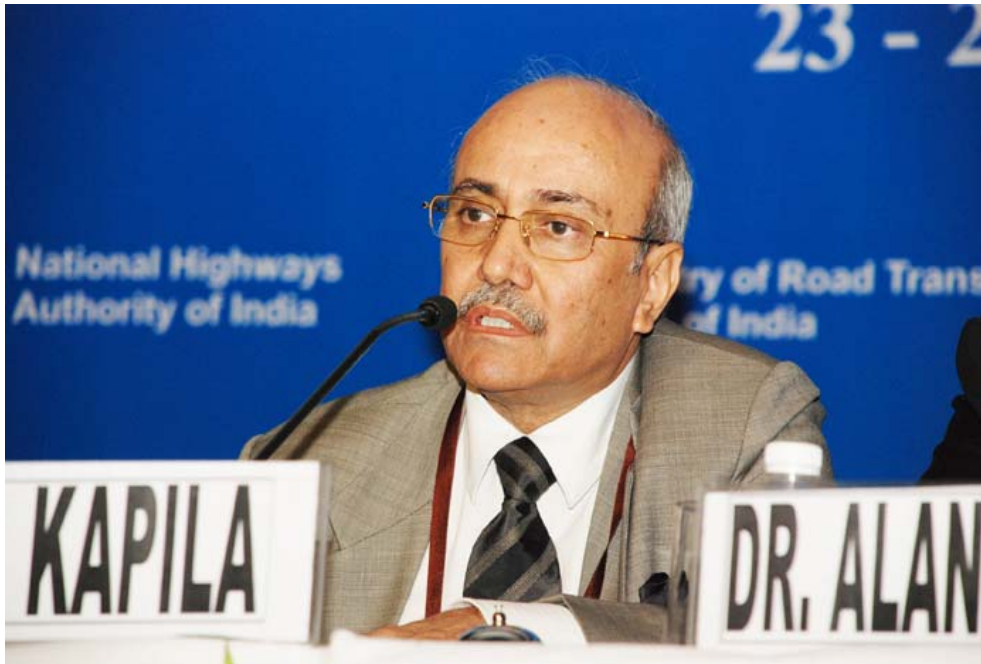


happening because vehicles are heavily overloaded. For a 2 axle truck the legal GVW is 16.2 tones, and it is very common to find such truck of GVW 25 tones or even more. With that kind of overloading, it is very difficult for the driver to control the vehicles if she is required to brake for some sudden problem in front of him. Issues of enforcement is with State Governments, but in a small ways NHAI has started plans to put in some weigh bridge in most of the toll plazas for BOT Projects, and it is the responsibility of the concessionaire to see that his road is not got damaged by overloaded vehicles. If the weigh bridge is there, as per the new toll rule there is provision for charging a higher toll rates from the overloaded vehicles. Once it is enforced on one highway and challan and/or stop them from using the road the message will go around. Within few days everything will come down and people will start following the rules.

Then, of course, in the urban areas, we need to provide more facilities for the pedestrians both in terms of footpath clear of obstructions and encroachments of the hawkers etc, and more facilities for crossing the roads. But here also it is seen that even if underpass or foot over bridge is provided, people do not use it. Nobody want to walk even 50 meters and want to jump the railings for going to the other side. Once again, we come to the issue that we have to educate our people. Of course, another issue, which was raised by one of the speakers, is that use of advance traffic management techniques like surveillance cameras at intersections and other places may be useful. Even if you simply put a camera, everybody will be alert and likely to follow the traffic rules. Also, you put some speed radars, even may be dummy ones, as if somebody checking your speed, then also there will be a sense of compliance. Another issue I would like to mention that we should earmark certain percentage of annual budget on highways for the safety. Earlier we were doing that in eighties but somehow it got merged with the normal highway works. We certainly can earmark 5% or 7% of the fund specially for road safety works like improving the intersections, if the studies have shown that one third of the accidents have happened on the intersections. If you improve the intersections, channelise them properly, put proper road signs, road marking, delineator etc. it can make a very good impact on the road safety situation. Further, I would mention about Dr. Ross's comments on the Manual for Road Safety in Design which we got prepared in 1998, a guide for highway engineers, and this was in association with the TRL and Ross Silcock, the company owned by Dr. Allan Ross at that time. That manual includes lot of practical situations about what is the existing situation and what counter measures can be implemented. It is a very good manual and we got printed about 1000 copies at that time. 400 copies were distributed to various state governments, 600 copies were given to IRC for sale. I have checked with IRC and they have said they have sold out all the copies. We will take up with IRC and try to get it printed again or may be soft copies we can make it available to professionals whosoever will be interested. One can use the recommendations straightway or with modifications based on experience, but lot of guidance is there which would be quite helpful.

Prof. Dinesh Mohan, IIT Delhi added that one Road Safety Manual which the World Health Organisation has got prepared for layman. It is a small manual, and if anyone goes to the WHO website and type "*whoinjury*" on *google*, you will go to the injury prevention website of the WHO, and there a Road Safety Manual for lay person is available for download free. And that is another very simple road safety reference for people.

**Mr. K. K. Kapila, Chairman, ICT Pvt. Ltd.**



Thanks to all the panelists for their valuable suggestions and recommendations.

After listening to the various speakers here, I would sum up a few of these points, even at the cost of repetition. It was said that we should not do our road safety audits, they have a limited advantage.

I beg to differ on this, and road safety audit should be carried out on all roads which have been built under the National Highway Development Projects as a matter of emergency and there should be simultaneously a drive to address the issues arising out of those recommendations. This should be done without any delay. Number of projects have been undertaken under PPP mode, I am sure each PPP operator would be happy to carry out these. Only thing they would need additional funds which would not be a problem for the Government to provide. Alternatively, give them more time to collect toll. There is an answer to every problem but we need to find the answer and not brush it aside. Thus, we do need to carry out the audit, we need to carry out the corrections on the existing system.

Second part is that we need to do, as a matter of urgency, a review of our designs and come out with correct cross-sectional designs for various situations which should be made applicable to all national highways and state highways. There should be no compromise to the safety requirements, and once it has been assessed, incorporate all those safety measures. There should be mandatory requirements to adhere to them. A minimum education for all drivers should be mandatory. You cannot have a driver on the road who cannot read a road sign. We need to put this in place and the method which we had been discussing over the past few days is that we need to have proper training for drivers. Driver is the one community which does not get any training except a few who are lucky to get institutions like that of Dr. Rohit Baluja. But the average driver does not have any good and proper training place. His father or uncle teaches him driving, and he just gets on to the road. He is able to get a license because the licensing system is so weak and poor, and therefore, we have these problems. So the answer is that we must, as a matter of great urgency, establish all over the country Driver Training Schools, where it should be mandatory for anybody applying for license to go and undertake training in such schools. And then, I would go a step further that after certain period of time when we have got adequate number of schools, we should have even the existing driving population who hold driving licenses, to go back for two days training and get recertification of driving skills, because we have a very large number of drivers on the roads who have no sense of driving.

Prof. Dinesh Mohan had made the point for helmet laws and seat belts. These needs to be enforced like all other enforcements. Even on the PPP roads, we must provide for enforcement, either give them the powers to do it or provide this as a special force, to be created for the purpose which could be charged and again covered by toll over a longer period of time. But we must provide on these roads necessary enforcement of traffic law as an immediate measure. You can not have highways where there is no law being enforced. Regarding painting of the bicycles by reflective paints, this has already been taken up as a part of the last year's recommendation, and I am pleased to inform you all that necessary directions in this regard are being issued by the Ministry of Heavy Industries. Mr. Dash, Jt. Secretary (Transport) was here this morning and he has confirmed to me that he has received a request from Mr. Brahm Dutt in this regard and suitable instructions are being issued to all people who have been given permission to manufacture bicycles by the Ministry of Heavy Industries.

As far as motor cycles are concerned, these will be taken up under the Motor Vehicle Act which is under amendment. We are also trying to see that this Motor Vehicle Act amendments are taken up on priority, and in perhaps 3 to 6 months the new act will be in place. Regarding setting up of special centres for transport research, I would like to inform that this is being considered very seriously and it will soon be possible for me to confirm to Prof. Dinesh Mohan ji that this can go ahead. In fact I would be very happy if you can prepare a report on this as a proposal, and IRF would be happy to even pay for the proposal for the 10 centers prepared with more exhaustive details including the cash flow requirements for setting up these centres, and we will be happy to support this initiative. IRF will take up this with the Government to see that these 10 training-cum-research centres are established and the necessary funds for the same are provided. Regarding trucks parked on the highways, I would like to request that we should provide adequate number of truck parking facilities while building the highways, if we want to avoid such accidents which happen because of wrong parking on the highway itself. I also strongly recommend that we should provide fluorescent paint not only on two wheelers but also on the rear of all vehicles which will go a step further in helping us to minimize road accidents.

These were my observations on the discussions we just had. We have prepared a set of recommendations which have been listed out, and I will just read out to you. These are not in any order of priorities but generally noted down, they will be prioritized later and we will be sending copies of these recommendations to all the authorities. And also a copy would be sent to all those who have attended the conference so that you know what have been recommended:

- (i) All vehicles are required to be with the certification of conformity. I&M regime to be in place by enactment. Government may include this in Motor Vehicle Act and make the provisions enforceable.**
- (ii) Uniform and stringent driver licensing system is to be implemented with a national register of drivers, and the driver skills should be developed through driver training school. Commercial vehicle driver licensing is to be done with more rigorous training and testing. Also regular fitness certification requirements for drivers and vehicles must be a mandatory requirement.**
- (iii) The claims of all accident victims to be settled in a time bound manner. It may be done with the out of court settlement of compensation and with the assistance of insurance companies. In fact I am thinking that in IRF we will set up a special cell to take up this with the insurance companies so that it can be facilitated and the middle man does not create havoc in this regard.**
- (iv) Provisions of Motor Vehicle Act and Central Motor Vehicle Rules to be made mandatory in all states and UTs through constitutional amendments, if required. Deficiencies in the legal provisions with respect to licensing,**

- (v) **Dissemination of pedestrian rights, education of rules of the road including signage marking etc. is required for common public as well as for planners, designers and engineers.**
- (vi) **Capacity building in handling of road safety problems is to be developed through inclusion in the curriculum of Civil Engineering and by extensive training of all stack holders including Police, Engineers and Planners.**
- (vii) **All School Education Boards shall include road safety aspects into the school curriculum at different levels. This is to be done across the country and in all school boards. In fact I have already written to the Human Resources Development Minister and met him also, and we are also advocating that in every text book of the school, the first opening page of the book and last page as you close the book should have road safety signs with their meaning so that the child when he/she opens the text books, sees the first thing as road safety signs. This has been accepted in principle, and I hope this would be implemented in the next academic year.**
- (viii) **Trauma care system is required to be established as an extensive network across the whole country. Law is to be stronger to make sure that victims get medical help without any hesitation from hospital. This has also been discussed at the highest level and an effort is being made to consolidate this with the help of the 4 public sector insurance companies and certain money supposed to be put in into this kitty through the cess that the Government is collecting and we hope to create a corpus of about 1000 crores. From this it will be made mandatory for the hospitals to treat the patients atleast for the first 24 hours. A legislation to this effect will be prepared and I am sure this will form a part of the Action Plan which will be taken up by the Government soon.**
- (ix) **All roads and the elements to designed with extra provisions, as we have discussed that at national and state level Road safety Boards are to be set up with enactment as lead agency to deliver road safety uniformly with targeted results as the focus. They will have to have a system approach for their functioning.**
- (x) **ITS applications to be utilized for traffic enforcement and traffic management to enhance safety. All accident data recording system to be completely revamped taking advantage of IT development and this can be done very quickly. Also detailed accident investigation and analysis to be take up at many centres to be established.**
- (xi) **CSR based safety programmes for infrastructure development to be encouraged by the Government as per the plans of local Government. Income tax exemptions to be allowed for the amount spent for creation of such facilities.**
- (xii) **Joint initiative to be taken by Government and Private sectors for carrying out research and implementation of road safety measures. Road safety in Expressway may be achieved through safety device incorporated in the Expressway infrastructure design itself and traffic operation to be done through ITS.**
- (xiii) **In-vehicle safety devices should be provided in every vehicle for safety of occupants, specially the commercial vehicles should be equipped with such safety devices as large proportion of highway accidents are for**



- (xiv) **Medical curriculum should include trauma care and trauma management subjects. Trauma care should be handled in an uniform format across the country by a Government policy.**
- (xv) **Road safety is not only a transport problem, it is a health problem as well as economic and social problem. This public health problem has an epidemic dimension, it has been established. It has the established vaccines, such as speed control steps against impaired driving, drunken driving and tired drivers, enforcement of seat belts, enforcement of helmets, better road signs, forgiving roads.**
- (xvi) **Impaired driver testing system has to be accurate. There is a system for checking drunken driving by breath analyzer test or blood test. Now here is a problem which I am posing to all of you and I expect you to come with some good answer and one who come out with best answer will be rewarded Fifty One Thousand Rupees by IRF. The question is how to identify driver who has driven continuously for more than 8 hours, who may be tired and drowsy. I want an answer to this which is implementable. How do we catch him and how do we prevent him from further driving?**

Dr. Allan Ross added that there is the answer in the other countries. For example, the European countries use a device in the vehicles by which you have a control and able to know how the vehicle has been used, if it is continuously used for a number of hours.

Mr. Nirmal Jit Singh clarified that it is possible to know how much the vehicle has run in the day, but how much one driver has driven is not possible to be derived.

Mr. K. K. Kapila mentioned that the problem is more complex, that is why the question. It is for all of you, and the prize money is for the answer. I am sure we will find an answer, this august group of delegates has the capable people who will scratch their heads and will come out with an answer. It will be properly assessed and whoever has gives the best answer, would certainly be acknowledged in IRF News and the amount will be sent to him. Well, with this we come to the close of this session.

I believe that we are going to start with the audit on the roads. We have already built roads, and on behalf of the Consulting Engineers Association of India, where also I am the President, I will appeal to all my consultant friends to make it a part of their job when they are doing a DPR. Please do an appropriate road safety audit on the designs, and of course, in various other stages of involvement in the highway projects.

Mr. Tony Pearce has emphasized that just one thing of basic audit has been requested here. In Europe, about 10 years ago the road safety charter was set, and those who signed this charter are required to specify concrete measures. These are going to be achieved in order to do achieve 50% reduction in the number of road deaths in the period upto 2010, in case of Europe. Even if we do not achieved the 50% reduction by 2012, 20 or 30% reduction also will be great if everybody actually thought about what they could concretely do in order to achieve this road safety target. In order to improve road safety, all must sign up a pledge, a charter to do it, then that could be a very good start; which would mean a commitment from all.

Mr. K.K. Kapila responded saying that, the point is well taken, and we will work out and get this in place.

