



**IRF WORLD ROAD
MEETING 2017**

/ 14-17 NOVEMBER / DELHI / INDIA /

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LINKING MOBILITY SOLUTIONS

18th IRF WRM 2017

Safe Roads & Smart Mobility – The Engines of Economic Growth

14-17 November 2017

Background & Recommendations

BACKGROUND

As a prelude to the WRM 2017, a Transport Ministers' Forum of Road Safety was held on 13th November 2017, leading to the Delhi Declaration, which has since been forwarded to the various participating countries for appropriate follow up action.

The WRM-2017 was held during 14-17 November 2017 at India Expo Mart, Greater Noida, NCR Delhi. The event was inaugurated by the Hon'ble Union Minister of Road Transport & Highways, Shipping, Water Resources, River Development and Ganga Rejuvenation, Mr. Nitin Gadkari. There were four Plenary Sessions on the following themes relevant to "Safe Roads & Smart Mobility".

Safe Roads and Smart Mobility

Safe Roads and Smart Mobility encompass a whole range of visionary aims, which constitute IRF's vision for the Road Sector. Countries across the globe are expected to achieve the Sustainable Development Goals through assured safety of road transport, together with smart mobility.

Transforming Transportation and Mobility

Since 1950, both Transportation and Mobility have undergone revolutionary changes through the green and digital revolution, with "Sustainable Mobility for All" being the target. Future of transportation and mobility should be defined by features like Universal access, Efficiency, Safety and Green technologies.

Road Safety: Realising Vision Zero

Based on the reciprocal responsibility and rights of the managers of the roads and needs of the users, many countries have adopted the Vision Zero concept to eliminate road deaths. Realisation of this goal uniformly across the world would be possible



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through Safe System Approach, adopting innovative best practices and learning from each other.

Creating Liveable Cities

Urbanization is inevitable because of economic compulsions; and therefore, liveable cities will have to be smart in terms of transport efficiency, GHG emission, controls, etc, and giving citizens the opportunity to live smartly for pursuing their livelihood, in a healthy environment.

There were 17 Special Sessions organized by various agencies to share experiences on the following topics.

- Intelligent Transport System (ITS) in India
- International Road Assessment Program (iRAP) – 3-Star or Better Roads: Global and Indian Success
- Mobility as a Service (Maas): Preparing for the New Era in Transport
- Argentina New Public Private Partnership (PPP) Projects: Plans and Tenders
- Drive Safe India Initiative
- Transportation Research Board (TRB) – Practice Informing Research: India's Transportation Experts Participating in Transportation Research Board
- Federation Internationale de l'Automobile (FIA) – Implementing the New Urban Agenda through Innovation
- Future of Road Safety and Capacity in India
- Global Alliance of Road Safety NGOs – Walking the Talk: Driving Action of the Sustainable Development Goals
- The International Road Transport Union (IRU) – Transport and Transit Facilitation in South and South-East Asia: Current Initiatives and Next Steps
- China Highway & Transportation Society (CHTS) – The Belt and Road Transport Cooperation
- The World Bank – Critical Issues in Implementation to Meet the SDG Targets
- Forum of European Highway Research Laboratories (FERL) – Transport Infrastructure Innovation and Exploitation
- World Road Association (PIARC) – The Importance of Asset Management
- Post-Crash Care
- Young Professionals Lab: Title: Prioritizing Road Safety Challenges from around the World
- Young Professionals Lab: Moving into the Future: Mobility, Liveable Cities and Big Data



There were 27 Parallel Technical Sessions as detailed below :

	Theme of Session	No. of Parallel Sessions held	No. of Papers Presented
1	Safer Roads for Economic Growth	1	4
2	Safer Roads	7	37
3	Institutional Framework and Capacity Developments	1	5
4	Managing Road Assets	4	22
5	Intelligent Transport System	2	10
6	Mobility Challenges	3	15
7	Innovative Road Infrastructures	5	24
8	Sustainable and Green Transport Infrastructures	4	19
	Total	27	136

RECOMMENDATIONS

Broad summary and the recommendations which have emerged from the deliberations in the 27 parallel sessions are summarised below.

Safer Roads for Economic Growth

Smart and safer roads only can contribute to the economy thereby leading to national growth and wealth creation.

- Poverty alleviation aspect should also be considered while computing the economic benefits of upgrading of the highway network.
- For “safer road investment plan” using iRAP, network level safety benefits need to be assessed, with emphasis on micro-level planning of infrastructure.
- Rural road infrastructure be created with a strategy on gender equity in terms of human-resource inputs.



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Safer Roads

For realizing the targets of SDG, Vision Zero and UN Decade of Action for Road Safety, features that absorb the energy from crashing vehicles is a must. For this, there is need to adopt forgiving roadside features supported with innovative appropriate technologies.

The following recommendations are specific to India.

- Crash Data Recording System using Advance Technologies with automatic data analysis tools will help authorities and policy makers to take decisions and implement measures to reduce the road crashes systematically. All States should have a uniform crash database system in place by 2020.
- Crash database systems developed should have interface with the “Vahan” and “Sarathi” databases developed by MoRT&H for vehicle registration and driver licensing databases in the States.
- Road safety culture needs to be developed to meet the ‘safe road user’ target for achieving the goals under to the UN Decade of Action for Road Safety, Sustainable Development Goals and moving towards “Vision Zero” objectives in a phased manner.
- Road safety education curriculum for class VI to Class X should be implemented across all School Boards by 2019.
- For safer behavior of road users, road safety education through campaigns covering targeted groups should be implemented along with strict enforcement measures.
- Behavioural change in road users can be achieved by 24x7 (round-the-clock) enforcement using appropriate technologies like camera and sensors for arresting all violations in traffic.
- Driver licensing should be modernized with on-line application and automated driver testing systems. For better skills in driving population, driver education and testing should be through simulators with real-world driving conditions on roads.
- Speed management using traffic calming and gateway arrangements along with other advanced technologies need to be adopted, especially where the highway passes through populated villages and towns.
- For divided highways with narrow medians, the prevention of head-light glare is a mandatory requirement for which appropriate suitable measures, such as expanded metal screen, etc., need to be adopted. This has been found to be a major cause of road crashes.
- Conspicuity of VRUs (pedestrians, bicycles and mortised 2-wheelers) at dark hours should be ensured for their safety in night-time use of roads. The bicycles and motorized two-wheelers must be fixed with retro-reflective devices for their visibility in high speed traffic.
- Motor Vehicle Act recommends fixation of retro-reflective tapes (red, yellow and white) on the sides (i.e. body) of the motorized commercial vehicles for their visibility to the trailing vehicles at night. A significant number of the vehicles are found to have



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complied with this requirement. There is need to strengthen the enforcement measures to ensure 100% compliance, particularly during issuance of fitness certificate.

- Updating of the vehicle ownership database with current address can be effectively facilitated only through the technology based enforcement (using camera, sensor and ANPR). For this, vehicle registration data needs to be updated for current address as soon as the address changes. This should be a legal requirement.
- While preparing Detailed Design Report (DPR) for highway development, the designated spaces outside the ROW, are to be allocated for current and anticipated roadside activities, for safety of traffic operations on the highway. Also, all accesses to the highways are to be only through strictly regulated permission, given jointly by the Government and the concerned Highway Authority.
- DPRs of the highways are to be as per the prevailing Codes/Guidelines and/or other international standards, and should be subjected to mandatory Road Safety Audits at design stage for ensuring that no specific safety feature is missed. Also, all features of the highway, in terms of grade separators, under/over passes, etc, shall be as per the requirements of projected traffic during the design life, without any compromise/curtailment of the designed features, for making it financially viable.
- The intersections are the most vulnerable locations in the highway network. The capacity for safer design of highways, especially in terms of safer designs of various types of intersections (controlled and uncontrolled), is to be created. This would require a widespread training of highway/design engineers for appreciation and developing requisite skills in safer geometric design.

Institutional Framework and Capacity Developments

Road and Transport Authorities in this sector should develop their skills for adopting modern and advanced technologies to achieve better efficiency and effectiveness for larger benefits to the populace. Demand for skill sets change as the society progresses economically are inherent, for Capacity Development.

- Lead Agency in the form of an Authority is required to be formed at the National as well as at State levels for managing Road Safety efficiently and effectively through complete coordination of all stakeholders.
- National Skill Development Agency should consider development of skilled manpower with appropriate skills for mechanized construction and maintenance of high-speed highways and expressways with highest level of quality.
- Engineers engaged in various Road Authorities at the National and State levels should be trained in the areas of Road Safety and Asset Management for effectively managing the road infrastructure assets.



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Managing Road Assets

The preservation of road infrastructure assets should be managed with better monitoring of their performance so as to preserve the asset value. Advanced sensor-based technologies should be used for monitoring/measurement of condition of the infrastructure. Further, the use of green material and technologies for preservation of the assets needs to be promoted.

- Asset management system based on realistic deterioration modelling and life cycle costing needs to be adopted for all categories of road infrastructures, by each Road Authority, in its respective network jurisdiction.
- For measurement of asset condition, advanced tools (accelerometer, camera, GPS, etc) and techniques (SEM, AHP, etc) should be regularly used to obtain condition data to facilitate their analysis at faster pace.
- For adoption of asset management philosophy for preserving asset value by the Road Authorities, there is need to introduce systematic reforms in the organization with upgradation of manpower, equipment and funding.

Intelligent Transport System

A paradigm shift is required for transport infrastructure, and especially in road sector to adopt intelligent communication systems like V2V and V2I for the infrastructure and services. The real-time monitoring of the traffic & transport system, by using ITS technologies, is a must to achieve better-efficient management.

- National architecture and standards for ITS is required to be developed/established by the Government for fast and uniform adoption of technologies for traffic management. In all such standardization and developments, interoperability is to be given top-most priority as an urgent requirement.
- Real-time traffic management in cities through ITS is the need of the hour, which will bring in enormous benefits in terms of savings in travel time, vehicular pollution and fuel consumption, as well as improvement in overall safety.
- Advanced incident management systems need to be developed for high speed network of National Highways and Expressways for safety of traffic operations. There should be extensive use of incident management camera for fast managing the incidents as well as controlling the violations (e.g. Contra-flow movements), which is a serious hazard in such network.
- ATIS (Advance Traffic Information System) should be implemented along all high-speed road network of SH, NH and Expressway for reporting weather and all traffic information to users through VMS.
- ITS application adopted for public transport provides maximum benefit to the populace; and therefore, all public transport systems in cities and in intercity operations should



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be ITS equipped, especially for passenger information system in all forms – at stops, in the vehicle and at home.

- Model ITS corridor should be built in one of the cities for developing understanding and to gain experience of such a system for adoption elsewhere on a larger scale, as required for specific objectives.

Mobility Challenges

Challenges to mobility in the developing world are very many with the mixed traffic, congestion, pedestrian and infrastructure safety issues, etc. The research and development in the area of safe and smart mobility has provided wonderful ideas and proven theories. Today the world can meet all the challenges, if we collaborate and adopt the knowledge around us, specifically, with the aim that public transport offering shared mobility must be promoted.

- Transit Oriented Development (TOD) is to be promoted in the developing world with policy directives to patronize public transport modes and control land use developments. However, such an initiative has to be supported by appropriate and adequate feeder services, planned and implemented simultaneously.
- Integrated transport services aiming to provide mobility to all sections of society (inclusive of accessibility), has to be achieved through directed, responsive and integrated planning of the transport infrastructure and services in urban areas.
- Planning and design of urban road network infrastructure, particularly for Pedestrian, NMT vehicles, should be based on equity in provision of facilities for all road users considering their actual estimated demands, thereby avoiding bias in the share of road space, resulting in the ills created due to the mixed traffic flows. Therefore, segregation of pedestrian and NMT flows is essential to enhance the safety and security of such users.
- Operational efficiency in urban transport system, including urban traffic control and infrastructure management system should be scientifically planned and designed to meet the mobility challenges.
- Wearing of helmets by 2-wheeler riders and seatbelts by all passengers of motor vehicles (front and rear seat) should be made mandatory across the country by government directive, without any option for the States to modify this requirement.

Innovative Road Infrastructure

Innovation in planning, design, construction and operation & maintenance/preservation of assets (the road infrastructures), through smart technologies adopted across the life cycle of the infrastructures, and making them environmentally sustainable, needs to be promoted.



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- Cross-section and geometry of the highways must be modified at locations, where the road passes through urban areas, and the roadside activities/land uses, duly accounts for parking, pedestrian or NMT facilities, etc. Similarly, the hill roads would also require special arrangements for safety of VRUs.
- Use of panelled concrete pavement for sustained savings in the cost of construction and maintenance will need further research for adoption, under various circumstances as extension of the “white topping” technology.
- Use of marginal materials and recycling of aggregates, from different sources, for construction of lower layers of roads should be encouraged as a policy for construction of all categories of roads.
- In case of heavily trafficked corridors or sections of roads, the option of CRCP (continuously reinforced concrete pavement) is highly suitable to lower the life cycle cost in terms of maintenance and sustainability of the road with good riding quality.
- Nano-technology based pavement materials, offer the advantage of higher performance of such roads, with better strength and lower rate of deterioration. Therefore, all such tested technologies with proven track records need to be promoted for economy in road development programs.
- The “New Generation Quick Launch Bridge” with 70R load capacity is more cost effective solution in mountainous regions, particularly in case of disaster emergency or for other strategic purposes.
- For developing climate resilient road infrastructure, research on high performance materials, designs and maintenance management methods should be undertaken for ensuring the sustainability of such road infrastructures.

Sustainable and Green Transport Infrastructure

The world has consumed natural materials for construction of the road and all other transport infrastructures during the 20th Century in an extravagant and unsustainable way; as a result, today the natural resources have depleted to such an extent that Governments have banned mining of natural materials.

- A control on pollution due to vehicular exhaust emission is possible through the inspection and maintenance (I&M) regime being put in place. This should be enacted as part of M.V. Act for annual I&M check by Transport Department through trained and authorized maintenance garages/workshops. This will also facilitate updating of the vehicle registration document with current address of the owner.
- Absence of last mile connectivity for public transport, forces the urban travelers to acquire and use the private modes negating the policy for promotion of public transport, thereby seriously affecting the air quality in urban areas. Feeder services operated by using solar power or batteries can provide clean last mile connectivity and need to be promoted
- The Government may develop a model 50-100 km long green and sustainable road corridor adopting proven green technologies for its various components, as a



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demonstration project. Based on this development, a guideline must be prepared for developing similar green corridors in other geographic regions of the country.

Trauma Care

The road crashes cannot be eliminated completely, and therefore, post-crash management of crash victims is an important aspect in a 'safe system' environment. It is established by research that life and disability can be saved for about 70% of the serious injury crash victims, with faster access to trauma care facilities.

- There should be universal Emergency Telephone Number for ambulance, fire and police assistance, as emergency caused by road accidents often require all these services together.
- Capacity building at the grass root level, for first aid trauma care needs to be taken up by the Government for creating a conscious and caring community along the highways. Training of able-bodied persons in villages/towns along the highway and all drivers of commercial vehicles will be the first step to achieve this goal. For commercial vehicle drivers, this training should be part of the essential requirement for commercial vehicle license.

Vehicle Safety

The vehicles driven on roads are also a key concern for overall safety in the road transport system. The modern vehicles are designed generally with all features that are required for safety in operation. In-vehicle safety features ensures the safety of the occupants in case of a crash, and therefore, these are important for safety of the road users.

- Passive safety features in vehicle, like seat belt, air-bag, ABS, etc are already mandatory requirements in almost all types of vehicles. Similarly, the ESC (Electronic Stability Control) system also should be made mandatory for avoiding particular type of crashes by loss of stability.
- All vehicles should be fitted with Alco-Lock to check the alcohol content in blood of the driver before starting the engine of the vehicle to be driven.