IMMA INTERNATIONAL MOTORCYCLE MANUFACTURERS' ASSOCIATION

Safer Motorcycling

The Global Motorcycle Industry's Approach to Road Safety

Including a compendium of industry-led best practices in safety and transport policy and awareness, training and education.

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International Motorcycle Manufacturers Association (IMMA)
Tel: +41229202123-Fax: +41229202121
20, Route de Pre-bois • CH-1215 Genève 15 • Switzerland
Contact: info@immamotorcycles.org
Website: www.immamotorcycles.org

ABBREVIATIONS LIST

ABRACICLO – Brazilian Association of Manufacturers of Motorcycle, Moped, Bicycles and Similar

ABS – Anti-Lock Braking System

ACEM – European Association of Motorcycle Manufacturers

ADAS – Advanced Driver Assistance Systems

AHO – Automatic Headlamp-On

AISI – Indonesian Motorcycles Industry Association

ARAS – Advanced Rider Assistance System

ARRB – Australian Road Research Board

ASEAN – Association of Southeast Asian Nations

CBS – Combined Braking Systems

C-ITS – Cooperative Intelligent Transport Systems

CMC – Connected Motorcycle Consortium

FAMI – Federation of Asian Motorcycle Industries

FCAI – Federal Chamber of Automotive Industries (Australia)

FHWA – Federal Highway Administration, USA

FIM – International Motorcycling Federation

IPR – Intellectual Property Rights

IRF – International Road Federation

IRTAD – International Road Traffic Accident Data group

IRTE – Institute of Road Traffic Engineering, India

ITARDA – Institute for Traffic Accident Research and Data Analysis, Japan

ITF – International Transport Forum

ITS – Intelligent Transport Systems

JAMA – Japan Automobile Manufacturers Association

LMIC(s) – Low and Middle-Income Countries

MAIDS – Motorcycle Accidents In Depth Study, Europe

MASAAM – Motorcycle and Scooter Assemblers and Distributors Association of Malaysia

MDPPA – Motorcycle Development Program Participants Association, Inc. (Philippines)

MIROS - Malaysian Institute for Road Safety Research

NHTSA – National Highway Traffic Safety Administration, USA

OECD – Organisation for Economic Co-operation and Development

OEM – Original Equipment Manufacturer

OISEVI – Ibero-American Road Safety Observatory

PPE – Personal Protective Equipment

PTI – Periodic Technical Inspection

PTW – Powered Two and Three Wheelers

SIAM – Society of Indian Automobile Manufacturers

TAIA – Thai Automotive Industry Association

TTVMA – Taiwan Transportation Vehicle Manufacturers Association

VAMM – Vietnam Association of Motorcycle Manufacturers

UNECE – United Nations Economic Commission for Europe

UN SDGs – United Nations Sustainable Development Goals

UNRSC – United Nations Road Safety Collaboration

USMMA – United States Motorcycle Manufacturers Association, Inc.

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PREFACE

IMMA recommends this document for use by the global institutions, safety managers and policy makers as a valuable resource for developing holistic Powered Two-Wheeler (PTW)[1] safety and transport policies at global, regional and national level. This will help public administrations realise the objectives of the 'Vision Zero' approach which is now increasingly accepted as the overarching philosophy for traffic and transport safety.

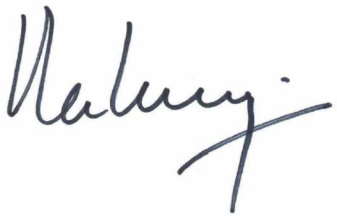
Work by industry, governments and other stakeholders has resulted in notable improvements in the number of PTW fatalities per 10,000 vehicles in circulation in most countries. This relative reduction must be seen against a background of a large increase of the PTW circulating parc during the same period. In other words, the risk for an individual user of having an accident on a PTW has fallen significantly, despite fatality numbers remaining unacceptably high.

Road safety strategies should be focused on a progressive improvement of traffic policy and vehicle technical standards while still ensuring affordability and adaptability considering the specific local context: many countries still lack even the most basic road standards.

This paper sets out four stages in policy making which, if adopted, comprise an effective, realistic and sustainable opportunity to address PTW safety.

Countries are encouraged to study the best practices established in this document and evaluate their adoption and implementation while considering the specific needs of their region. In regions with a relatively high use of PTWs, safety policy development should be directed at further enabling sustainable PTW use, recognising that PTWs are vitally important in terms of affordability, mobility, the economy and the environment.

We dedicate this publication to our dear friend and colleague Edwin Bastiaensen who served as IMMA Secretary General from 2011 to 2024. The grief from the tragic loss of Edwin has touched the whole motorcycle community across the globe. Edwin was a figurehead to our industry, well known to so many in our sector and beyond, through the international institutions with which IMMA collaborates.



Eric de Seynes

IMMA President

[1] The term "Powered Two-Wheeler" (PTW) covers a wide diversity of vehicles. The products are divided into different segments such as moped, scooter, street, classic, super-sport, touring, custom, supermoto and off-road PTWs and tricycles. In international regulatory environment, PTWs fit under the term vehicles of category L. IMMA represents mopeds, PTWs and three-wheelers. Therefore, IMMA refers to PTWs as Powered Two and Three Wheeled Vehicles.

ABOUT IMMA

The International Motorcycle Manufacturing Association (IMMA) represents the manufacturing industry of powered two wheelers (PTWs) at global level. IMMA represents a major part of the worldwide manufacturing of PTWs.

IMMA, as the trusted global voice of PTW manufacturers, promotes mobility through safe, sustainable motorcycling. This is achieved by the development and harmonisation of technical regulations affecting the PTW industry and by advancing inclusive policies for motorcycling.

In addition to the activities of IMMA members in their respective regions and countries, IMMA has made key contributions in various road safety networks and forums, such as the International Traffic Safety Data and Analysis Group (IRTAD), plus the OECD and International Transport Forum (ITF). In 2013, IMMA joined the United Nations Road Safety Collaboration (UNRSC).

With over 75 years of experience and founded in 1948, IMMA has been a strong contributor to the work of the UNECE Inland Transport Committee (ITC), in particular the work of the World Forum for the Harmonization of Vehicle Regulations (WP.29) and the Global Forum for road traffic safety (WP.1).

An assembly line in Austria. Workers are employed around the world in motorcycle manufacturing.

IMMA's core business is the negotiation of global international legislation on the construction and use of powered two wheelers. IMMA enables the industry to speak with one voice at all levels. Membership comprises the following associations:

Regional Associations

National Manufacturing Associations

Associated Members

Regional association members

- **The Motorcycle Industry in Europe (ACEM – www.acem.eu):** representative of the industry in Europe with members from Austria, Belgium, Czech Republic, Finland, France, Germany, Greece, Hungary, Ireland, Italy, the Netherlands, Poland, Portugal, Spain, Sweden, and United Kingdom.
- **The Federation of Asian Motorcycle Industries (FAMI – www.fami-motorcycle.org):** representative of the industry in South and East Asia with members from Indonesia, Japan, Malaysia, the Philippines, Republic of China (Chinese Taipei), Thailand and Vietnam.

National manufacturing members

- **The Society of Indian Automobile Manufacturers (SIAM – www.siam.in)**
- **The United States Motorcycle Manufacturers Association (USMMA)**
- **The Brazilian Association of Manufacturers of Motorcycle, Moped, Bicycles and Similar – (Abraciclo – www.abraciclo.com.br)**

Associated members

- **The Federal Chamber of the Automobile Industries (FCAI – www.fcai.com.au),** representative of the industry in Australia
- **The Moto Canada (www.motocanada.com),** representative of the industry in Canada

SUMMARY

Increasing numbers of PTWs are being used across the world. This document looks at various ways in which this increase can be achieved in a safe and sustainable manner, whilst continuing to allow the full benefits of PTW use.

IMMA proposes that policymakers use a Four-Stage Strategy when looking to improve the safety of PTWs. These Four Stages are:

- Stage 1. PTWs must be positively included in public policy
- Stage 2. Road infrastructure must be designed and maintained with PTWs in mind
- Stage 3. Effective and affordable training and education
- Stage 4. Harmonised vehicle requirements and technology advances

IMMA also sets out various other suggestions for improving road safety for PTW users, such as ensuring a wide range of stakeholders are involved in discussions, better data collection and tailoring campaigns to local needs. Industry is keen to play a part in an integrated approach alongside other stakeholders.

This document calls upon governments across the globe to take a strategic approach to PTW safety, actively involving all relevant stakeholders and using accurate, standardised data to inform and support any policy decisions. The approach should take into account the specifics of PTW characteristics and their specific use. Countries are encouraged to study the best practices established in this document and implement these according to specific local and regional needs.

1 INTRODUCTION

A Flexible means for delivery of goods taking up little parking space.

Increasing numbers of people in both developed and Low and Middle Income Countries (LMICs are choosing to use Powered Two Wheelers (PTW). To secure safe and sustainable use of this low-polluting and low-congesting mode of personal mobility, transport planning policies at all levels must integrate PTW use and recognise the benefits of PTWs in society, business and emergency transport.

According to the Global Status Report on Road Safety by the WHO issued in December 2023, more than half of fatalities are among pedestrians, motorcyclists and cyclists. The proportion of powered two- and three-wheeler users makes up 30% of all traffic fatalities globally, a modest reduction of 2% in 10 years, when comparing with the Global Status Report dated 2013. WHO also estimated that powered two- and three-wheelers have nearly tripled in number, with a 175% increase since 2011.

IMMA, as the global voice of PTW manufacturers, promotes safer and sustainable PTW use through advocating the development and harmonisation of technical regulations affecting the PTW industry and by advancing inclusive policies. Road safety is an inherent part of the motorcycle business.

Continuous technological development has allowed manufacturers to significantly improve the safety and environmental performance of their vehicles while keeping them affordable according to circumstances in the region. Technical features such as Automatic Headlamp On (AHO), Combined Braking Systems (CBS), Anti-Lock Braking Systems (ABS), or Start-Stop Systems, are

becoming more widespread in several regions as prosperity is growing. Manufacturers are also promoting safety through a variety of training, educational and communication activities.

An encouragement to develop and implement comprehensive legislation and policies on PTWs was also made in the UN Resolution A/72/L.48 "Improving global road safety", 6 April 2018. It was renewed on 31 August 2020 with the A/RES/74/299, resulting from the 3rd Global Ministerial Conference on Road Safety in February 2020 setting out a new target for road safety for the next 10 years and proclaiming the Second Decade of Action for Road Safety 2021 – 2030.

In June 2022, the UN General Assembly issued the Political Declaration A/RES/76/294 herewith committing to scale up the efforts on road safety to achieve the reduction of 50% by 2030 and calling for setting national targets, taking into account the special needs for those road users who are most vulnerable.

Specifically on motorcycle safety, in December 2022, the International Transport Forum published a policy brief resulting from a series of virtual expert workshops with a variety of institutions including IMMA, highlighting pressing safety issues and presenting priority actions for improving motorcycling safety[2]. Safe use of urban space, safe vehicles, education and safety culture, redesigning infrastructure, and investment in knowledge were among the priority issues.

The need to improve and develop specific road infrastructure solutions for PTWs was also recognized in a series of PTW safety roundtable meetings, organized with the support of the Road Safety Forum WP.1. Infrastructure solutions such as dedicated PTW lanes or advanced stop lines need to be further explored.

In regions where there are already millions of PTW users, safety policy development should be directed at further enabling sustainable PTW use. The objective should be to maximise opportunities to ride on roads, which will be safer, while recognising that PTWs continue to remain vitally important in terms of affordability, mobility, the economy and the environment.

The UN General Assembly adopted on 3 June 2024 a new resolution on road safety. The resolution urges Member States and relevant actors to accelerate and scale up efforts to implement the Global Plan, to make road safety a political priority and to ensure its relevance in the broader sustainable development agenda.

[2] www.itf-oecd.org/improving-motorcyclist-safety

1.1 PURPOSE OF THIS DOCUMENT

IMMA's goals in this document are:

1. To improve motorcycle safety and by doing so, allow governments, administrations and society to benefit fully from the contribution that PTWs make to transport, mobility and the economy.
2. To prompt global, regional and national policy makers to consider PTW inclusion in strategic traffic and transport policies.
3. To demonstrate that an integrated approach, involving multiple stakeholders and taking account of local situations, is essential for improving PTW safety.
4. To promote key tools and instruments which enable PTW safety policies.
5. To improve rider skills and the promotion of training and education.
6. To promote harmonisation of vehicle requirements in the context of the UNECE World Forum for Harmonization of Vehicle Regulations (WP.29) and to advance the development and implementation of traffic policy under the Global Forum for Road Traffic Safety (WP.1)
7. To foster a healthy competitive environment across the global PTW industry and promote the development and use of state-of-the-art technologies.
8. To support forums establishing standards and methodologies, e.g. on accident data collection and analysis.
9. To support and contribute, through all the above, to the UN's Global Sustainable Development Goals.

1.2 INTRODUCTION TO THE FOUR-STAGE STRATEGY

As a single key recommendation, IMMA calls for the adoption of The Four-Stage Strategy. A brief overview of this strategy is described below and more detailed examples can be found in chapter 3. The Four-Stage Strategy promotes road safety by: focusing on the positive inclusion of PTWs in national, regional and international transport policy; encouraging rider-friendly infrastructure policy; supporting lifelong training and education; and investing in safety related technological developments.

The Four-Stage Strategy's integrated perspective aims to deliver improvements at a holistic level rather than limiting changes to a single area of transport or safety policy. Working in partnership, with all stakeholders involved in PTW safety and policy, is essential to ensure that a holistic rather than a 'piecemeal' approach is taken.

Rather than taking a 'one size fits all' approach, the Four-Stage Strategy emphasises the local and regional context of transport, development and urbanisation, all of which affect the particular circumstances of PTW users and industry. By doing this, public authorities will have the greatest chance of securing safety improvements while at the same time realising the PTW opportunity that exists in relation to transport networks and citizens' mobility.

Stage 1. PTWs must be positively included in public policy

IMMA's Road Safety White Paper, 2014 edition.

The promotion of PTW usage in transport policy can have a considerable impact on reducing congestion, and can bring economic gains through access to jobs, social mobility and even healthcare in LMICs where other transport modes are unavailable, impractical or too expensive.

PTWs should be integrated into policies and initiatives aimed at creating a safer environment for road users and addressing vulnerabilities shared by all users of two-wheeled transport (including cyclists). For example, a strong need for parking facilities for PTWs has been identified in many regions, especially near public transport hubs enabling door-to-door travel.

Powered Two Wheelers in various mixed traffic situations (South-East Asia, India and Brazil)

The social and economic benefits of PTWs include:

- The provision of affordable mobility solutions, especially in low personal income economies
- Reduction of congestion and pollution
- Increasing overall transport efficiency
- Mobility provider in urban, rural and remote areas
- Delivery of public services, including healthcare
- Enablers of business
- Increasing social inclusion and the engagement of young people
- Enabling access to areas affected by emergencies, such as natural disasters
- The PTW industry and its supporting sectors creating economic growth and employment
- The social and economic contribution of PTW sport, tourism and leisure

To facilitate an exchange of views on the required policy-making for including PTWs, IMMA and their members contribute to global policy making discussions and periodically organise road safety conferences in the regions to promote best practices.

Stage 2. Road infrastructure must be designed and maintained with PTWs in mind

In many LMICs, uneven and damaged road surfaces have an important negative impact on PTW safety. However, even in developed countries, safety issues caused by poor infrastructure persist. Examples include badly positioned or unnecessary street furniture, visibility at junctions, pot-holed roads, dangerous crash barriers and raised divides on roundabouts.

- There is an urgent need to study possibilities for further improvement and promote the wider adoption of successful practices. The need to improve road infrastructure for PTWs, especially in LMICs, was recognised in a series of PTW safety roundtable meetings in 2015, 2016 and 2017, organized with the support of the Global Road Safety Forum WP.1.
- The conditions for the most effective PTW friendly infrastructure solutions that increase the road capacity and safety by creating a homogenous traffic flow, such as dedicated PTW lanes, advanced stop lines and access of PTWs to bus lanes need to be further researched, evaluated and promoted.

Stage 3. Effective and affordable training and education

IMMA supports both pre- and post-license training for PTW riders. It is also crucial that other road users have an appreciation of the dangers of misjudging the speed or behaviour of a PTW rider – including the common error of failing to see, or judge the speed of, an approaching PTW.

Motorcyclists being trained (Thailand)

- Training for all types of license holders should include awareness of the characteristics and behaviours of other vehicles and their users.
- Initial rider training for novice riders, prior to their acquisition of a licence, should be encouraged and made available in countries where this option is not provided.
- Resources and infrastructure are needed for PTW training and education, especially in countries where the volumes of PTW usage exceed automobile usage by far.
- Improve the quality of the available training schemes: minimum standards and certification of training and trainers should be introduced. Training should be designed to enhance PTW safety by putting a rider's hazard awareness and perception at the core of the training curriculum.
- Promote lifelong training and voluntary post-licence training.
- Targeted mandatory components on the interaction between drivers/riders and perception of PTW riders should be a part of the training curriculum and licensing assessments of other vehicle drivers.

Other measures linked to safety and education include:

- Impaired riding: Improving attitudes of riders towards safer and risk-free behaviour (inappropriate riding, alcohol, tampering, riding without a proper PTW licence) through awareness campaigns combined with appropriate and consistent enforcement.

- Helmets: The usage rate of safety helmets should be brought to 100% through a mix of targeted enforcement and safety awareness campaigns, geared towards local conditions. It is essential that targeted enforcement is only used as part of wider actions to engage riders in safety awareness in a positive way. Awareness should also be raised of the importance of ensuring the correct size, fitment and fastening of helmets.

There is increasing awareness on the benefits of PPE (India)

- PPE: The promotion of the benefits of proper personal protective equipment (PPE) amongst riders should be done in line with riders' specific needs, local context and climate conditions. Implementing certification procedures contributes to ensure the availability in the market of appropriate safety equipment for riders and passengers such as gloves, jackets, trousers and boots.

Stage 4. Harmonised vehicle requirements and technology advances

The industry is fully committed to the research and development of PTW safety technologies. When vehicle requirements related to new technologies are considered, IMMA emphasizes the importance of addressing these through WP.29, for the harmonisation of vehicle technical regulations.

With appropriate consideration for the economic conditions of each vehicle market, manufacturers promote technologies suitable for the road conditions and usage patterns of the customers in each country or region.

It should be remembered that providing PTWs with additional options or technologies, or introducing a vehicle specific regulation, is not on its own enough without a strong and continued integrated policy involving rider behaviour, training and infrastructure.

To ensure and preserve fair, free and open competition, governments need to ensure clear vehicle requirements, which include the appropriate safety performance requirements for new vehicles in their country. Such vehicle requirements should preferably be based on international regulations established under or derived from the World Forum for Harmonisation of Vehicle Regulations (WP.29).

Contracting Parties to the UN instruments[3] under the Word Forum benefit from the uniform system of technical regulations for vehicles, equipment and parts and apply those international regulations suitable for their needs in their territories. The recent updating of the 1958 Agreement will create unprecedented benefits for countries that are not yet involved in the global forum to increase their safety standards, in conformity with their regional conditions.

[3] http://www.unece.org/fileadmin/DAM/trans/main/wp29/wp29wgs/wp29gen/wp29pub/WP29-BlueBook-4thEdition2019-Web.pdf

1.3 FURTHER RECOMMENDATIONS

IMMA's further recommendations towards a comprehensive PTW friendly policy are:

Safe System Approach

Growing PTW traffic makes it imperative to adopt safety interventions targeting this mode of transport, while integrating it into a safe system approach. The safe system approach recognises that road users can make mistakes or take inappropriate decisions.

- The role of the system is both to minimize the production of these errors and to protect road users from death and serious injuries when errors occur[4].

Need for an integrated stakeholder approach

Improving the safety of PTWs should be a shared responsibility. Safer riding requires the involvement of all road traffic stakeholders: not only riders themselves but other road users, public authorities and governments, research institutions, national road infrastructure designers and local city planners.

- IMMA recommends the organisation of periodic PTW safety conferences both globally and regionally or nationally to evaluate progress and promote best practices.

Need for accurate and harmonised data collection and benchmarking

Reliable road safety data is essential for the understanding, assessment and monitoring of the nature and magnitude of road safety problems and related solutions. It informs the setting of achievable safety targets, plus the design and implementation of effective safety policies and measures.

- To allow meaningful comparisons between country safety performances and evaluation of best practices in policy making, common methodologies should be applied for the collection of harmonised data, performance indicators and exposure data. Through benchmarking, many lessons can be gained from the analysis of a country's performance and policy in relation to practices in other countries especially when they are at the same level of development.
- Establishing common causes of accidents through in-depth accident investigations will allow stakeholders to understand causes and identify solutions.
- Data underreporting numbers of PTWs, their use, crashes and casualties is a significant problem that needs to be addressed in all regions.

Actions tailored to local situations

Strategies, campaigns and activities aimed at safer riding will be most effective if they have the acceptance of the local public and riders.

- Measures need to be tailored to local traffic needs and local, national and regional constraints.

[4] Improving Safety for Motorcycle, Scooter and Moped Riders, OECD/International Transport Forum, 2015 (http://dx.doi.org/10.1787/9789282107942-en)

2. Powered Two-Wheelers as a Global Mobility Solution

2.1 Sustainable Development and PTW Use

In all regions of the world, increasing numbers of people are living in cities. The UN projects this trend will continue in the coming 40 years, with rural populations increasing only in Africa and Oceania. This development will exacerbate the problem of traffic congestion, parking provision and the inability of traditionally accepted alternatives to solve this problem.

Congestion beating solutions require attentive driving by all involved (Brazil)

In developed regions, use of PTWs will continue to grow due to:

- Their ease of movement in crowded urban environments
- Smaller parking areas needed
- Reduced environmental footprint
- Benefit of a personal door-to-door solution
- Low cost of use.

In rapidly growing cities, public transport is not always well organised, adequate, or reliable. Average incomes are increasing, along with the need for personal mobility solutions. If PTW users were to switch in large numbers to public transport, existing systems would in some cases risk becoming overwhelmed.

In LMICs, PTW usage is expected to continue to grow steeply, due to:

- Their low purchase cost and low fuel consumption relative to personal income profiles
- Limited public budgets and the lack of flexibility in public transport systems remaining obstacles
- The increasing need for personal mobility solutions for commuting as a result of economic development.

These trends have implications for mobility, infrastructure and urban planning. Any increase in the use of PTWs can be linked to public policy agendas of increasing decarbonisation, improving air quality, and developing e-mobility schemes. This makes sustainable development important both to the PTW industry and to IMMA. Recent developments in public policy now place cycling at the forefront of a wider strategy to encourage non-automobile modes of transport. This has been done despite cycling having a challenging road safety record. Measures to improve cycling safety and to encourage its use are now central to public policy. This example for another vulnerable road user group, illustrates an acceptance that safety is not a good reason to fail to support a mode of transport if wider benefits

to society can be realised. PTW use offers an even broader range of social and economic benefits, therefore the policy tools applied to cycling use must also be applied to PTW use. This will unlock greater opportunities for public authorities to invest in PTW safety under mainstream transport policy.

The following examples demonstrate that embracing the PTW in public policy could help mitigate traffic congestion and meet other challenges of urban mobility.

Belgium, Europe: benefits of switching from automobiles to PTWs

A 2012 study by the University of Leuven found that if just 10% of drivers swapped their automobiles for PTWs, their time spent in traffic would decrease by 40%. When 25% of automobile drivers switched, congestion was eliminated entirely. The time benefits on the Belgian highway network were estimated at 50 M€/ year.

Paris, Europe: 100 million additional km travelled by PTWs

A study revealed that 100 million additional passenger km were made by PTWs in 2007 compared to 2000. The increase was due to the shift from public transport (53% and private automobiles (26.5%. The shift resulted in a positive cost/benefit ratio with a €115 million improvement in prosperity. This switch to PTWs occurred through natural modal shift and not as the result of any campaign by the public authorities. The study concluded that, compared to the bus and other public transport, PTWs are a mode of transport which lend themselves to the high flexibility requirements of individual mobility.

Innovations in vehicle stability and design has attracted new users to PTWs (Europe)

Brazil, Latin America: PTWs supplementing public transport

As in many Latin American countries, the use of PTWs continues to increase. According to the IRF, in 2016, 27% of all registered road vehicles in the country were PTWs. Buying a PTW instead of using public transport is more common (60% than for pleasure/leisure (19% or as a mode of transport for reaching work (16%). 10% of people use PTWs instead of their automobile. The boom can also be explained by the increase in purchasing power, availability of credit, and the fact that two-wheeled vehicles are relatively inexpensive and agile for congested city streets (OECD - ITF Joint Transport Research Centre draft Report "Safety of Powered Two Wheelers", 2014). This kind of modal shift has been shown to increase public transport capacity, so providing opportunities to decrease automobile use (See Pierre Kopp[5]).

[5] http://www.uetr.eu/en/upload/docs/IPOL_STU2018629182_EN.pdf

Japan, Asia: Park and Ride facilities for PTWs

As cities and local transport authorities are strongly investing in mass public transportation services, there is an additional and increasing need for adequate PTW Park and Ride facilities at public transport hubs. PTW use fills gaps in the public transport system and provides connections for the 'last mile'. An increase in such parking facilities will also result in eased traffic congestion and improved road safety.

In Japan, motorcycles are subject to parking violation enforcement. PTW parking availability contributes to safe and convenient road use. However, responses to a JAMA survey show that motorcycle users in urban areas in Japan continue to have difficulties in finding parking space and are demanding increased PTW parking availability.

Results of JAMA's fiscal 2017 domestic motorcycle market trends survey showed that the most prevalent (at 30% use of motorcycles is for commuting to work or school. Nevertheless, more than half of the survey respondents residing in Tokyo affirmed that motorcycle parking availability is inadequate, particularly around train stations, in city centre areas, and in expressway service areas.

Results of a JAMA fiscal 2014 survey on the status of motorcycle parking measures taken by local administrative bodies showed that in some municipalities, motorcycle parking space demand had been effectively met through the provision of PTW parking space using vacant public land.

Need for increasing the number and capacity of PTW Park and Ride facilities (Japan)

2.2 The Wider Societal Benefits of Powered Two-Wheelers

Besides driving economic growth, PTW use also contributes towards wider economic and social goals. In many cases, PTWs are core to the delivery of essential public services.

'Mototaxi' or bike-taxi

Increased use of PTW for delivery services (Thailand)

'Mototaxi' or bike-taxi services are a common form of public transport. Different names exist in the regions and the services provided can vary per region as well as the type of vehicles that are predominantly used. The use of PTWs as commercial vehicles has substantially increased in several major cities over the past decade, particularly in LMICs. These types of flexible and affordable delivery and mobility services have emerged to address the problems of traffic congestion, hot weather, or simply for convenience. Riders will often offer a variety of services such as taxi or delivery providing a maximum of flexibility.

The use of PTWs as commercial vehicles has substantially increased in several major African cities over the past decade. Similar services also exist in South East Asia and in some countries in Latin America.

This phenomenon has also been observed in European regional and capital cities, including Barcelona and Paris, where small logistics deliveries provided by PTWs and 'Mototaxi' or bike-taxi fleets are common.

Mototaxi services should be developed according to appropriate safety procedures, emphasizing the importance of ensuring the safety of both riders and passengers.

Social inclusion and mobility

PTWs can offer a means to lessen social exclusion, particularly that caused through unemployment. PTW use can allow people to access work, training or education in areas of the world where public transport is unreliable, automobiles unaffordable, and commuting by bicycle unrealistic or impractical.

Wheels-2-Work scheme

UK, Europe: Since it began in 2002, the scheme has given several thousand, mainly young, people the means to travel to work. This programme focuses on loaning mopeds to people in mainly rural areas, who would not otherwise be able to get to and from work.

Motorcycle Ownership Programme

Indonesia, Asia: After one year of service, the employer will offer to convert each permanent employee's transport allowance to ownership of a motorcycle. Most employees will choose to convert, due to the greater benefits of having their own transport. The company will hold the Vehicle Ownership Document for four years, after which it will be given to the employee.

Healthcare delivery

First aid can be delivered quickly with a motorcycle (Japan)

PTW couriers delivering health care services and relief, often sponsored by industry, are common in various countries and regions.

Motorcycle Outreach

Indonesia, Asia: A healthcare logistics project on the island of Flores provides small PTWs for use by healthcare workers in remote rural areas where roads are poor or non-existent. The ability for basic services to be provided via PTWs (to a population of over 50,000) has seen a dramatic improvement in basic healthcare indicators since 2002[6].

Blood Bikes

UK, Europe: "Blood Bikes[7]" have been a feature in the UK since 1969. In recent years the number of blood bike groups has grown significantly and there are now more than 1,400 advanced qualified rider volunteers of the Nationwide Association of Blood Bikers (NABB). There are also other associations and charity foundations with similar objectives including delivery of human tissue such as organs. There are times when blood, or other medical items need to be transported urgently because a patient's life is at risk. A "blood bike" can be relied upon to respond quickly and move with ease through busy traffic. Good practice is promoted among volunteer riders, who need to hold an advanced riding qualification to ride on a marked-up "blood bike". According to NHS Blood and Transplant, volunteers delivered 1.32% of all the units of blood moved in 2015 (29,300 blood units).

Motorlance

Thailand, Asia: In Thailand, which is well-known for traffic congestion especially in urban area, PTWs have been used for medical support or 'motorlance' since 1993 by Royal Thai Traffic Police. The traffic police are granted first-aid training enabling them to assist injured persons including taking them to hospital as quickly as possible. Motorlances are equipped with first-aid kits and necessary medical tools for emergency childbirth. As of 28 April 2024, they have provided assistance to 44,902 sick or injured persons in a variety of situations and more than 285 cases of delivering babies[8].

Natural disaster relief

Even where there are blocked roads, collapsed buildings and mountains of debris, PTWs can negotiate rough road conditions and cramped spaces. PTWs are used to send messages and information, to transport injured people, to deliver basic supplies, and to conduct numerous emergency relief activities immediately after quakes, volcanic eruptions and other natural disasters.

[6] http://www.motorcycleoutreach.org
[7] http://www.bloodbikes.org.uk/index.php/why
[8] https://www.facebook.com/profile.php?

Delivery of mobile health services after an eruption

Indonesia, Asia: In 2010, the eruption of Mount Merapi in Indonesia affected a multitude of small villages including Jumoyo Village with a total number of 7,376 inhabitants. PTWs were used for rapid delivery of mobile health services.

Help with relief after earthquakes

Japan, Asia: PTWs also provided significant support after the Great Hanshin Earthquake (1995), the Great East Japan Earthquake (2011) and the Kumamoto Earthquake (2016). The authorities and large numbers of volunteers used PTWs in these crises because of their greater mobility. Moreover, when the gasoline supply network failed, the subsequent severe fuel shortages meant that highly fuel-efficient PTWs proved extremely valuable.

Motorcycle delivers aid after a natural disaster (Japan)

Rural PTW use

Convenient and affordable transport services that allow rural residents to reach markets and basic services are essential. Access can be delivered through a variety of modes. Motorcycles and motorcycle taxis and ambulances are among the primary means of doing so, forming an important part of the rural economy in many countries.

As various crash causation studies clearly confirm that rural roads pose significantly higher risk than urban roads, there is a high need and urgency to upgrade rural infrastructures. This will also benefit other vulnerable road users such as bicyclists and pedestrians (Global Mobility Report 2017).

Police, defence and enforcement services

PTW use by public authorities and defence forces remains widespread worldwide. The characteristics of PTWs lend themselves to a range of duties such as escort, communications, emergency assistance, enforcement (particularly in congested traffic), crowd control and rapid response to emergency situations. Police officers have reported feeling more approachable by members of the public and PTWs can have a more high-profile appearance when undertaking certain duties.

Use of Powered Two Wheelers by law enforcement officers
(Germany, Spain, Brazil, USA, Thailand, India)

Sport and Leisure

Professional, off-road and amateur PTW sport is followed by millions of enthusiasts and communities around the globe. Sporting activities are structured in hundreds of motoclubs and federations around the world, most of them under the umbrella of the International Motorcycling Federation (FIM. PTW use for sport and leisure brings personal benefits such as stress reduction, social interaction with others, and the individual, or shared, pleasure of riding. These different leisure-related activities support local tourism sectors and their supply chains, and they play an important role in local economies.

An increase in female usage of motorcycles is observed in many markets (USA)

Motosharing

Renting a motorcycle for relatively short periods of time is showing an upward trend in many cities and is becoming a popular alternative to the use of private vehicles and public transportation. This service allows the users to use a motorcycle at any moment by simply using a software application, during the time needed and then leaving it for its use by the next customer.

The PTWs used in these fleets are often propelled by an electric powertrain, making this a flexible, affordable and sustainable solution for urban transport. It is vital that riders are properly licenced and trained according to local rules.

2.3 INCREASING PTW PRESENCE IN THE WORLD

PTWs are one of the most common types of motor vehicles in the world, particularly in Asia, Africa and Latin America. In these regions, PTWs are crucial to national economies as a high proportion of these economies are organised around this means of transportation: commuting, post, mototaxi, delivery, police, firefighters, rescue teams, humanitarian workers, etc.

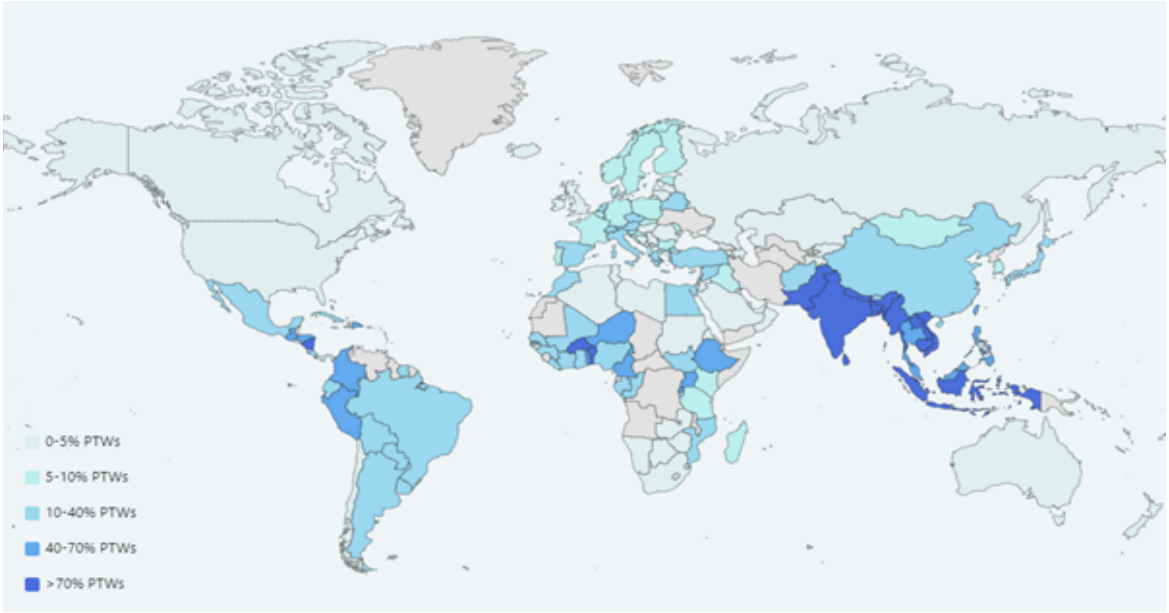
WHO Global Status Report (2023) estimated that PTWs have nearly tripled in number, with a 175% increase since 2011.

The global increase (2011-2023) is driven by:

- the South-East Asia Region with a 273% increase
- the Region of the Americas with a 217% increase
- the Western Pacific Region with a 155% increase and
- the European Region with a 142% increase.

The number of PTWs in traffic is very different across the glove with a significant % of the global fleet of PTWs being in the southern hemisphere.

The below illustration provides indication on the share of PTW collected from WHO/IRF (2021 data).
Data for Benin, Burkina Faso, Burundi, Cape Verde, Cameroon, Cote d Ivoire, Gambia, Ghana, Guinea, Mali, Nigeria, Senegal, South Sudan, Uganda, Uruguay is for different years)



[9] Global status report on road safety 2023 (who.int) – World Health Organisation
[10] The Wheels of Change: Safe and Sustainable Motorcycles for Sub-Saharan Africa - Amend
[11] www.Worldroadstatistics.org - International Road Federation

Asia

- The share of PTWs compared to other types of vehicles is extremely high in India (77%) with 226 million units and 83% in Indonesia with an estimated 122 million.
- Motorcycle density is also tremendously high in Vietnam with every person in possession of 1 motorcycle and Thailand with one motorcycle in use for every three persons

Africa

While statistics are challenge for markets in Africa, publications on motorcycling from this region or IRF/WHO data, also indicate also high motorcycle densities in some countries, for example in Ethiopia (57%), Kenya (between 64% and 81% %) and the Republic of the Congo (72%).

Latin America

The use of PTWs has considerably increase in the past 10 years. Also, in this region, PTWs' share of the motorised vehicle fleet varies greatly per country. While in Argentina, indications for 2021 are 35% (9 million units), higher motorcycling shares are reported in Colombia (between 63% and 73%). In Brazil, PTW use increased by 40% between 2011 and 2021, with 30 million units in 2021.

Europe

The % of registered motor vehicles increased from 11% in 2018 to 12% in 2021. In most of Europe, the average EU PTW circulating rate is higher in urban areas, and can be as high as 30 % or more.

North America and Australia

The rate of PTWs is approximately 3% in North America, with the number of units ranging from 9 to 11 million and 5% in Australia with almost 1 million units.

2.4 DIVERSITY OF PTW CATEGORIES

PTW characteristics

Noting the differences in the use of PTWs in the world, the term "Powered Two wheelers" (PTWs) includes products from small 50cc step-through vehicles, up to motorcycles of 1000cc and over. These products are divided into different segments, such as: moped, scooter, street, classic, performance or super-sport, touring, custom, supermoto and off-road motorcycles.

In the international regulatory environment, in particular UNECE, PTWs are referred to with the term: 'vehicles of category L'[12].

Many people consider 'motorcyclists' to be a homogeneous group of people, and as such, road safety solutions and public policy decisions are often aimed at this 'group'. However, PTW riders within each country represent a wide variety of people who use vast numbers of different vehicle types, with different characteristics, designed for myriad different terrains and used for numerous distinct purposes. The differences are even more significant when compared globally, where the terrain, cost of living, infrastructure and climatic conditions vary so greatly.

It is this diversity that means policy approaches cannot work to a one-size-fits-all approach designed to "improve motorcycle safety globally". Safety policy needs to be tailored to differing local environments and to take account of the PTW's position in the society and economy of any given country – plus the social, mobility and economic opportunities that safer motorcycling can bring to such societies. IMMA strongly supports the sharing of best practice, which can be applied or adapted where appropriate to the local situation of traffic and usage patterns.

Diversity of owners and usage patterns around the world

As visually illustrated on page 29 on the map with the variation of the PTW presence in transport mix around the globe, in large parts of the world, PTWs are used by the majority of commuters and on a daily basis. In some regions, PTWs are also used by specific groups for leisure activities.

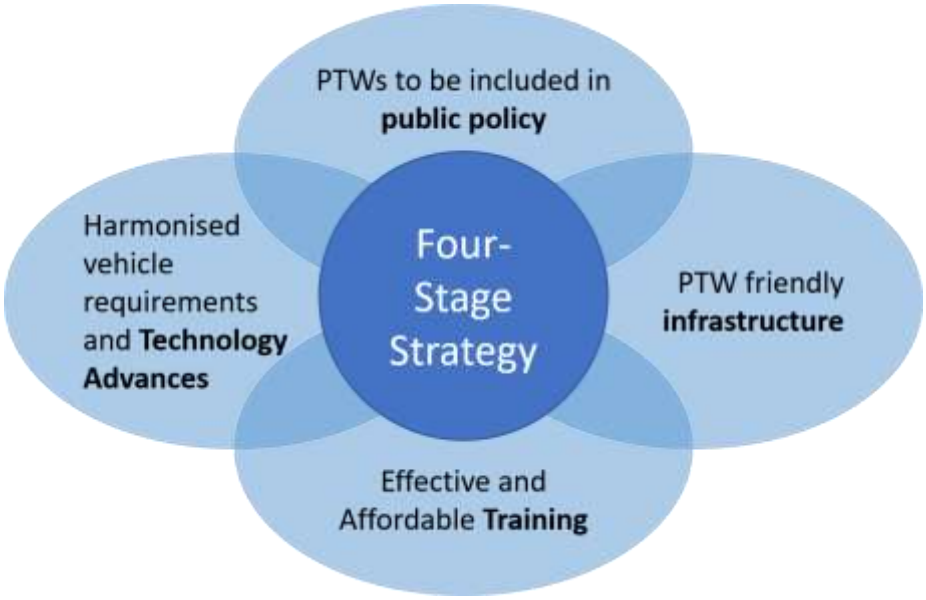
In many countries and in regions like Europe, leisure machines offer a 'cross over' function, also being used for commuting.

Diversity of powered-two-wheeler vehicle designs

[12] Consolidated Resolution on the Construction of Vehicles (R.E.3) The R.E.3 provides guidance for vehicle categories under the 1958 Agreement.

Diversity of PTW categories and use

3. THE FOUR STAGE STRATEGY



IMMA's Four-Stage Strategy

3.1 PTWS MUST BE POSITIVELY INCLUDED IN PUBLIC POLICY

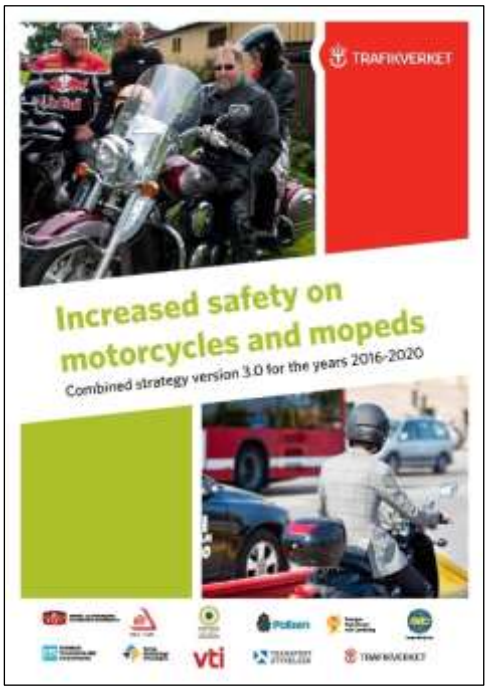
Sustainable motorcycling allows society to benefit fully from the PTWs contribution to mobility of people and goods, improved access to fundamental services both in urban and rural areas, enhanced social welfare and economic growth.

International and regional institutions must integrate PTW use into overall transport and urban planning policy to improve safety, support riders, and help realise the positive potential of PTWs for society. This systematic approach should involve major stakeholders: road operators, policy makers, legislators, road users, industry and media.

It should apply realistic and economically viable principles, such as:

- Fair and equal access between and within all transport modes
- Freedom of choice by users and business to select the most appropriate transport mode for their mobility needs
- Transport and mobility efficiency, encouraging the most suitable and effective mode of transport according to the circumstances.
- Safety policies for PTWs should not merely imprint developed countries' initiatives onto LMICs.

  To achieve integrated, targeted and effective policies, safety issues should be 'pre-audited' and assessed by all important stakeholders: road operators, policy makers, legislators, road users, industry and media.



Example of a national holistic road safety strategy by government and stakeholders (Sweden)

Effectively including motorcycles in traffic policies should also include the timely evaluation of adequate detection of PTWs by advanced technologies on other vehicles, such as Advanced Driver Assistance Systems (ADAS).

OECD Conference

Lillehammer, Norway: In 2008, the first international conference on PTW safety of its kind was held, organised by the International Transport Forum (ITF). It brought together policy makers from various EU and OECD countries, industry and academia. The workshop concluded that PTWs have a natural place in the transport system, while the vulnerability of riders necessitates training and awareness as well as responsibility from individual road users. In 2015, the International Transport Forum (ITF) released a Research Report[13] on Improving Safety for Motorcycle, Scooter and Moped Riders, summarizing the findings of the work of the Working Group on the Safety of Powered Two Wheelers set up by ITF after the 'Lillehammer' workshop.

International virtual International Transport Forum workshop, June 2021: As a follow up to Third Global Ministerial Conference on Road Safety, held in Stockholm in February 2020, the International Transport Forum (ITF), the Swedish Transport Administration, the Swedish National Road and Transport Research Institute (VTI), the International Motorcycling Federation (FIM), and MMA and its Members organised a virtual workshop on PTW Safety.

[13] Improving Safety for Motorcycle, Scooter and Moped Riders | ITF Research Reports | OECD iLibrary (oecd-ilibrary.org)

The workshop was held over several days and involved more than 150 experts from all regions in the world.

The following issues were addressed: (i) Sustainable practices, work-related issues and procurement, (ii) Modal shift and urban needs, (iii) Training, education, and licensing, (iv) Vehicle safety, protective safety, and Intelligent Transport Systems, (v) Road infrastructure and road environment, (vi) Speed management, adapting speeds and behaviour to different environments, (vii) Youth and child safety.

The goal was to develop and propose directions and priority actions for policy makers to effectively include and improve safety of PTW riders in their regional, national, or local road safety policy activities. The workshop recognized the existence of unique regional aspects to motorcycling while seeking to define a short list of effective mechanisms, valid for all regions.

Eight priority actions were recognized to achieve the integration of PTWs in the safe system by 2030. These actions build on the Stockholm declaration[14] and its 9 recommendations and based on careful consideration and discussions among leading global experts on the diverse associated fields of expertise.

ITF workshop *'Riding in a safe system'*

The 8 priority actions from the workshop were[15]

1. Move to sustainable corporate management practice for powered two-wheelers
2. Make smarter use of urban space
3. Adopt safe vehicles and equipment in line with international standards
4. Educate motorcycle riders and promote a traffic safety culture
5. Redesign infrastructure to increase motorcyclist safety
6. Ensure safe speeds for all road users, including motorcyclists
7. Reduce children's exposure to motorcycle crashes
8. Invest in knowledge on the causes of and remedies for motorcycle crashes.

[14] Stockholm Declaration: Third Global Ministerial Conference on Road Safety: Achieving Global Goals 2030 Stockholm, 19–20 February 2020

[15] https://www.itf-oecd.org/motorcyclists-safety-workshop-riding-safe-system-closing-plenary

Industry Safety Policy and Promotion Conferences

IMMA members periodically organise road safety conferences in their respective regions, with the aim of engaging in discussions with policy makers on the need and directions for road safety policy making.

Tour of the interactive exhibition with Minister of Interior and Director General of Tráfico

Zaragoza, Spain, 2024:

The International Motorcycle Road Safety Conference was hosted by IMMA member ANESDOR and the Dirección General de Tráfico (DGT) involving IMMA and its European member ACEM. More than 400 in-person and online participants from different continents, observed the exchanges of insights by experts from institutions, industry, research centres, users and infrastructure operators on motorcycle safety. The Conference was connected with an interactive exhibition, demonstrating vehicles, personal protective equipment and safety and mobility technologies.

SAFE Annual Convention, India, 2024: SIMMA member, SIAM annually organizes the Annual Convention of the Society for Automotive Fitness & Environment (SAFE). This initiative by SIAM is a prestigious event addressing safety and environmental issues nationwide. The convention serves as a platform to discuss progress and initiatives in four areas of road safety (Engineering, Enforcement, Education, and Emergency Care) and to exchange best practices with government bodies, corporations, OEMs, road safety experts, NGOs, schools, and administrators. In 2022, SIAM launched its "सुरक्षित सफर" (Safe Journey Initiative) in Odisha, extending its reach to Assam in 2023 and Karnataka in 2024.

SAFE Annual Convention 2024 : "United Efforts for Road Safety: Our Roads, Our responsibility" inaugurated by Hon'ble Chief Minister Mr Siddaramaiah, Government of Karnataka

Brussels, Belgium, October, 2020: The safety strategy, presented by IMMA-member ACEM, *"The safe ride to the future 2.0*[16]*"* sets out the European industry vision for the European Union's '*Horizon 2030* 'in areas such as advanced safety technology and connectivity. It elaborates on the industry's initiative to increase the quality of post-license training through a European Training Quality Label and describes how the sector has been working with other stakeholders to promote the implementation of transport policies that encompass motorcycle safety. The European industry endorsed the Safe System approach towards motorcycling, simultaneously addressing human, vehicle and road infrastructure factors. The industry's approach was endorsed by the European Commissioner for Transport and the EU Coordinator for Road Safety.

Malacca, Malaysia, 2023: MASAAM has successfully organized the Road Safety Seminar during a FAMI meeting that was held in Malacca, Malaysia on 7th March 2023.

Ceremony during the FAMI Road Safety Seminar, 2023

The speakers were from Malaysia's regulatory bodies and government agencies from Royal Malaysia Police (PDRM), Malaysian Institute of Road Safety Research (MIROS) and Malaysia Automotive Robotics and IoT Institute (MARii). The seminar was attended by all FAMI members and received a good response from the participants.

Global Forum for Road Traffic Safety (WP.1)

The UNECE pioneered road safety activities in the United Nations system with the establishment of an Ad Hoc Working Group on the prevention of road accidents in 1950. In 1988, the Working Party on Road Traffic Safety (WP.1), an intergovernmental body, was established. The Working Party changed its name to "Global Forum for Road Traffic Safety (WP.1)" in 2017.

Under the auspices of the Global Forum for Road Traffic Safety (WP.1), the Institute of Road Traffic Engineering (IRTE) organised a series of conferences. The latest event was held in December 2023. The workshops recognized the urgency to consider PTWs in infrastructure improvements and consideration by the Global Forum of the principle of 'harm reduction' as

[16] https://roadsafetystrategy.acem.eu

practiced in public health. Harm reduction techniques seek to reduce the risk of behaviours which may be difficult or counterproductive to eliminate through other means[17].

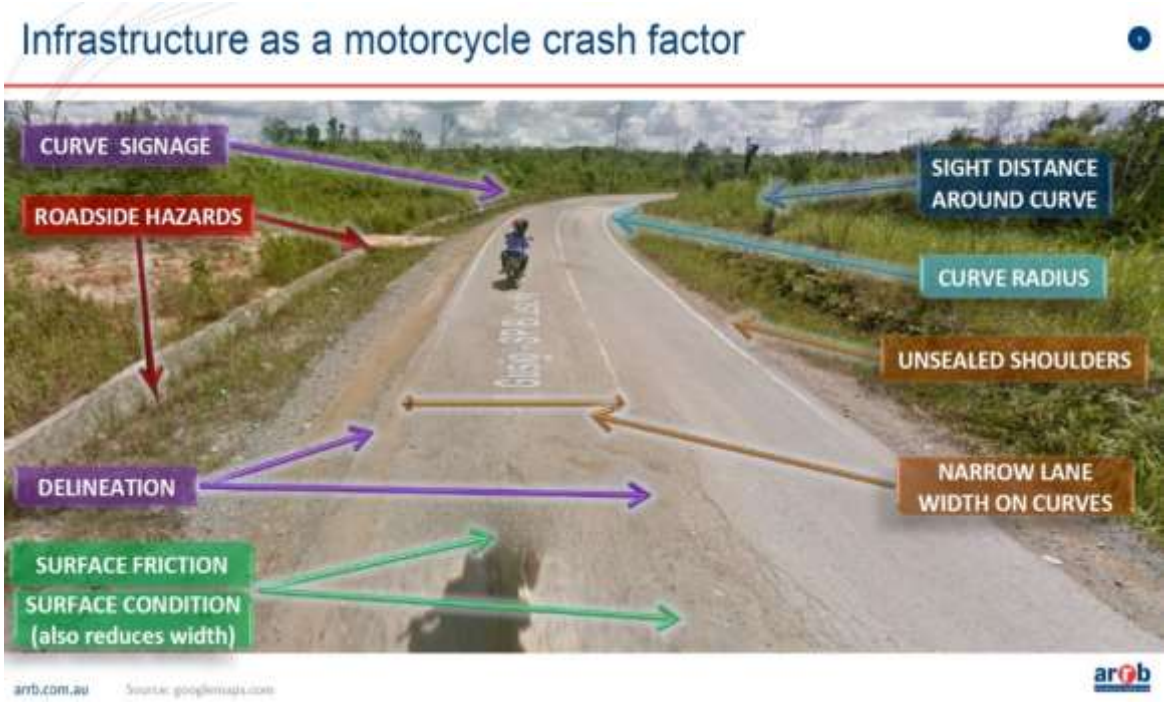
Global Road Safety Initiative, held on 4-6 December 2023 in New Delhi

New Delhi, India: The "Global Road Safety Initiative" (GRSI) was held on 4-6 December 2023 in New Delhi to review the legal instruments and codes of practice in order to consider practical experience regarding the unique road safety issues facing emerging economies in Southeast Asia and beyond. It was organised by The Institute of Road Traffic Education (IRTE) in partnership with the Ministry of Road Transport & Highways, India and in association with the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) and the United Nations Economic Commission for Europe (UNECE). The event addressed safety of PTWs among other themes, thereby considering criticalities and needs of some regions to implement the appropriate road safety policies to improve road safety. The GRSI brought together government representatives from 25 countries across the globe to include India and South-East Asian countries, the industry, academia, and the Global Forum for Road Traffic Safety (WP.1).

Diverse observations and recommendations were shared and presented for continued discussion in the WP.1. Among others, the conference reported on segregated lanes for PTWs, strongly recommended for consideration by nations where PTWs comprise a large proportion of the overall vehicle fleet. Also, lane filtering by PTWs was recommended for consideration on roads where ample segregated spaces cannot be provided, such as urban roads, and where enforcement of lane use rules (operation within prescribed lanes) by other traffic (three and four-wheeled vehicles) can be ensured.

[17] Policies for Vulnerable Road Users (VRU) - focus on road safety challenges in low and middle-income countries as identified during the South-East Asia project. ECE-TRANS-WP1-2022-6e-Rev1, 87th session of Global Forum for Road Traffic Safety, 25-29 September 2023

3.2 ROAD INFRASTRUCTURE MUST BE DESIGNED AND MAINTAINED WITH PTWS IN MIND



Road infrastructure elements contributing to run-off road crash risk

Infrastructure is a highly important issue for PTW safety. Road infrastructure influences both the likelihood, as well as the severity, of a crash. As PTWs are often forgotten in road design and evaluation, they should be identified as an independent road user group and be considered as a 'design vehicle' during road design and asset management and maintenance practices as identified in the Austroads Research Report (2016)[18].

- USA: Motorcycles were more frequently involved in fatal collisions with fixed objects than other vehicle types. In 2016, 23 percent of the motorcycles involved in fatal crashes collided with fixed objects, compared to 17 percent for passenger cars, 13 percent for light trucks, and 4 percent for large trucks[19]
- Europe: In at least 3% of accidents, the primary cause was a road design defect. Infrastructure played a role in 8% of all accidents. Poor conditions on many roads, and the fact that PTWs are often neglected by transport plans, are the principal reasons for this situation. Roadside barriers were found to present an increased danger to PTW riders, causing serious lower extremity and spinal injuries, as well as serious head injuries[20]
- Malaysia: Fatal motorcycle crashes occur mainly on major trunk roads with smaller access junctions[21]. Malaysia has been building exclusive lanes for motorcyclists since 1980 to

[18] http://www.fema-online.eu/website/wp-content/uploads/australia_MC_and_infrastructure_research2016.pdf
[19] https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812492
[20] MAIDS
[21] MIROS - Malaysian Institute for Road Safety Research, 2016

reduce the risk of collision and injury of motorcyclists by taking them out from the mix where interaction between motorcycle and larger vehicles is frequent.

- **Brazil**: Poor road conditions were considered a contributing factor in 18% of road accidents.[22]

Regional initiatives have helped point out the continuous need for validating the importance and design of crash barriers, the absence of objects on the side of the roads, and the importance of signage to warn road users of complex and hazardous situations ahead. However, many challenges remain, particularly in LMICs where many roads are unpaved, road user licensing systems undeveloped, rider training virtually non-existent, and structures to administer these systems are in a 'fledgling' situation.

Best practice in PTW mobility infrastructure

Several publications have been created through collaborative efforts by government officials, road design engineers and industry experts to identify specific issues of attention and to improve riding conditions for PTW users. This shared expertise has provided best practices which can be adopted in other countries or regions. These lessons and best practices need to be further promoted and disseminated to infrastructure planning officials in the developing world.

Some proven and tested best practice examples include:

Inclusion of PTW in initial design phase – PTW-friendly road design

- Inclusion of PTWs in infrastructure policies, traffic issues, land use and parking
- Consideration of PTW users in design and construction of tolling plazas on motorways and consideration of toll-free highways for PTW users
- Separation of vehicle types to create more homogeneous traffic, e.g. through dedicated PTW lanes fitting to local situations and or advanced stop lines at traffic lights.

Basic road infrastructure audits, assessment and adaptations

- Narrow lane width, sharp curvature during a curve or poor skid resistance all increase significantly the accident risk factor
- Standards for marking or signing road hazards, plus illumination at night of dangerous hazards
- Quality standards for unsealed roads. Even 'Grade A1' 'large chip' gravel roads are often hazardous for PTW users – firmer types of unsealed surface should be used and regularly graded and rolled. This problem applies worldwide

Simple infrastructure adaptations to support PTW friendly traffic and improve PTW safety

- Remedial action towards black spots, with special attention to intersection design and traffic signs dedicated to warning riders at places of recurring accidents such as 'yellow box junctions' and enforcement
- Create dedicated parking spaces for PTWs
- Advanced stop lines at traffic lights for riders
- Bus lanes which allow access by PTWs

[22] ABRACICLO

- Provision of separate lanes where there are large numbers of motorcycles can reduce the potential for conflicts with larger vehicles[23]. In Malaysia, benefits of reduced PTW accidents have been reported between 25 and 34%[24].
- Inclusive motorcycle lanes are installed on the existing road and are usually located on the outside of the main carriageway for each direction of traffic flow. Motorcycle lanes may be separated from the rest of the road by painted lines or physical barriers. They are a flexible solution for the road authority, by allocating a specific strip to PTW-users. However, at intersections where inclusive motorcycle lanes rejoin the main carriageway, crashes can occur so attention should be paid to intersection design. Such solutions account for nearly 20% of the primary road network in Malaysia.
- Exclusive motorcycle lanes require a completely separate carriageway from that used by other vehicles. Exclusive motorcycle lanes minimise crashes at intersections. Such infrastructures are exclusively for mandatory use by PTWs.
- Allow lane splitting and communicate clear behavioural guidelines for PTW riders.
- Fit safe roadside barriers which are motorcyclist friendly.
- Identify quick solutions, at a relatively low cost, such as reflective stickers and beacon lights, which can be installed to warn the PTW driver of dangerous situations ahead. Such easy to implement solutions should be used to address accident black spots.

Research is needed to evaluate and promote the most effective solutions to adequately include PTWs in road traffic

[23] http://www.toolkit.irap.org – provides also various design guidelines
[24] MIROS – Malaysian Institute for Road Safety Research (http://www.miros.gov.my/xs/index.php)

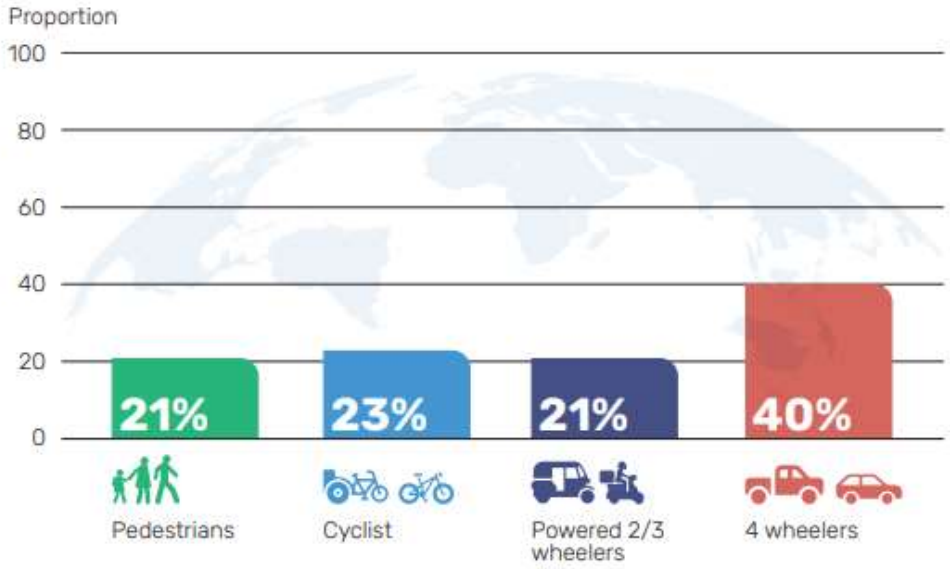
Road maintenance and incident management

- Improvement and maintenance of road surface conditions (including avoiding poor quality road building leading to rapid deterioration, as can be seen in parts of West Africa and elsewhere) is also critical for safe riding.
- Remove oil spills that can create dangerous slippery conditions.

Although in advanced PTW markets there exists several PTW infrastructure manuals, there is a general lack of research and evaluation of PTW infrastructure solutions. There is a need for assessing these with a common methodology to enable researchers to deduct good and successful practices. Some experiences have been exchanged at PTW Policy workshops under Global Forum for Road Traffic Safety (WP.1) in 2016 and 2017. However, further research for friendly PTW infrastructure is needed.

IRAP states that 3-star rating is widely accepted as the minimum acceptable rating for new and old roads. However, only 21% of roads meet a 3-star or higher rating for powered two- and three wheelers.

Fig. 10. Proportion of paved roads with a 3-star[a] or higher safety rating, by user group (500 000 kms evaluated, globally), 2021



Source: International Road Assessment Programme *(22).*

[a] Out of a possible 5-star rating

Global status report on road safety 2023. Geneva: World Health Organization; 2023. Licence: CC BY-NC-SA 3.0 IGO.

3.3 Effective and Affordable Training and Education

Human error was found to be the major accident cause in 87.9% of all accidents in Europe. Infrastructure was the main causation factor in 7.7% of accidents, and vehicle-related factors were the main causation factor in only 0.3%[25]. Encouraging behavioural change should therefore be at the forefront of road safety activities and initiatives.

Awareness raising for all road users

Greater emphasis is needed in pre-licence-test training for all vehicle types to raise awareness of the behaviour of other road users. Particular emphasis should be put on recalling that PTWs are smaller in profile, so harder to recognise in traffic, and that it is harder to judge their speed.

Japan: In 70% of accidents involving PTW users, automobile drivers were the primary causation factor, whereas PTW riders were exposed to a higher risk of being the victim in an accident. Furthermore, in over 80% of crossing collisions and collisions while turning right, the cause was a delay in the automobile driver noticing the PTW. In nearly 70% of instances this delay was due to an insufficient check on the traffic[26].

Europe: Other vehicle drivers are largely responsible for PTW accident causation in 61% of the multi-vehicle accidents. However, PTW riders were responsible in 52% of fatal accident cases. Other vehicle drivers, who also have a PTW licence, are much less likely to fail to perceive the oncoming PTW (or misinterpret its distance and speed) than those drivers who do not have a PTW licence[27].

Brazil/Colombia: Accidents in Brazil are reported to be mostly due to lack of attention of other drivers. The other vehicle is responsible in more than two thirds of the accidents in Colombia[28].

Exchange of experience is an important part of the training program (India)

[25] MAIDS, Europe
[26] ITARDA – Institute for Traffic Accident Research and Data Analysis, "Information n°91", November 2011, Japan
[27] MAIDS, Europe
[28] Causas de acidentes com motociclistas, ABRACICLO, 2013 and Las motocicletas en Colombia: aliadas del desarrollo del país, Asociación Nacional de Empresarios de Colombia, 2017

USA: Initial results of the FHWA study[29], involving 350 in-depth PTW crash investigations in California, show that in 70% of the multivehicle crashes, the other vehicle drivers' traffic scan contributed to the crash and in 43% of the cases the other vehicle drivers' attention failures were identified as crash factors.

Unpaved road riding skills training can improve on-road skills (Thailand)

Thailand: The in-depth PTW accident investigation study involving a total of 340 cases, by the Thailand Accident Research Center (TARC) reported that:

- 22% of all motorcycle fatalities were single vehicle crashes and 77% of fatalities happened due to multi vehicle crashes, with another vehicle.
- The primary contributing factors to crashes were the PTW rider (53%) and the Other Vehicle driver (38%).
- In 27% of all cases, the primary accident contributing factor was perception failure on the part of the PTW rider, followed by the perception failure on the part of the Other Vehicle driver (24% of all cases), and reaction failure on the part of the PTW rider (14% of all cases).
- Among the PTW fatalities, 54% of riders did not have a license. 87% of accidents involved riders with no special training on how to ride a motorcycle. 72% of the involved automobile drivers also didn't have special training on how to drive. They were trained by families, friends or self-training.

[29] https://highways.dot.gov/safety/motorcycle-crash-causation-study/motorcycle-crash-causation-study

Lifelong training of PTW riders

Training programmes address development of vehicle control skills and hazard perception (Indonesia)

Good anticipation is perhaps the greatest aid to safety that a rider has, and the best way to acquire this is via training. However, much training happens ahead of a rider gaining a licence (so-called initial rider training) and sometimes the skills are not developed and practiced after the licence is acquired.

Training can be split into two key parts: vehicle control and hazard perception. Much initial rider training necessarily focusses on vehicle control, as this is where the most common threat to the rider occurs, for example, falling off at low speed. At this stage, riders need to focus on balance, using the controls and learning to master the machine. Once the rider has mastered this to a basic level, the trainer then usually moves on to teaching how to spot and avoid hazards.

IMMA members are actively involved in rider training and often participate in conjunction with government agencies or working groups on rider education. Through these efforts, they can provide affordable, accessible and effective training to PTW users. The industry encourages continued outreach to new and existing PTW riders on the importance of life-long rider training in both novice rider training and voluntary training after riders have acquired a licence.

Rider training courses vary widely between countries due to differing national requirements, vehicle fleets and training resources.

In some countries (especially in LMICs) there is an absence of mainstream training schemes and the industry training offer is often the only one available which underlines the huge importance of the industry engagement in this domain. Courses are offered for different groups of riders: novice riders, advanced riders, corporate training, police force training, etc.

The following examples show very clearly the enormous impact of the industry's training activities:

- USA - Over 10 million motorcyclists trained over the last 50 years.
- Brazil - Mobile Training Units are available in 22 states. Since 1998, 5,840 courses were organized, and more than 242,496 riders were trained through specific industry programmes.
- Vietnam - 23.4 million people were trained from 2015-2023
- Thailand – 13.38 million riders were trained through the manufacturers' and dealer networks (1998-2023)

Initial rider training

Use of a motorcycle riding simulator to develop foresighted riding skills (India)

Initial rider training provides the basic skills and awareness needed for novice riders. Subsequently, more advanced courses provide additional opportunities to increase rider proficiency and safety and hazard perception skills. A variety of training options are offered within the context of PTW sports, on dedicated tracks and off-road terrains, which allow riders to greatly enhance their skills of control of the vehicle.

Due to the sheer number of PTW riders in the Asian region and the limitations of space and suitable facilities, the industry has been advocating with governments to promote the introduction of riding simulators to help to educate and provide affordable training to PTW riders.

Advanced training

Advanced training is often offered in conjunction with local governments and many manufacturers offer courses for riders. This training is usually for riders who have a licence and can therefore be considered for post-test training. As some parts of the world have little or no formal training pre-test, these training courses can be useful for teaching riders skills they did not previously have. As much of this training takes place in an off-highway environment, e.g. a closed race track, riders practice their skill in a safe environment and can push themselves to improve their machine control significantly. Moreover, this training has the added advantage of familiarising riders with new technology, such as ABS, which may not have been available when the rider initially acquired their licence.

However, studies of advanced training for automobile drivers have seen the concept of advanced training come under criticism for giving road users false confidence. Controlling a PTW can be a more complex task than controlling an automobile due to the necessity of the rider to move their bodyweight. Therefore, vehicle control skills on a PTW are important and can always be further developed.

Some advanced training, for example the KNMV "*Risico Herkennen*" course from the Royal Dutch Motorcyclists Association, has been shown by independent studies to improve the hazard perception of riders. This course focusses on following riders and alerting them to the kind of hazards they experience on a regular basis. Its success has meant that it has even been subsidised by local authorities in the Netherlands. This type of training, allied to improving vehicle control and offered in various countries in various ways, gives riders multiple reasons to undertake advanced training and is the reason that IMMA's members continue to promote advanced rider training and life-long learning. An example of the industry ensuring continued high standards in advanced training is the European Motorcycle Training Quality Label, more details of which can be found in Annex 1.

Promoting safer riding behaviour through sport and leisure

Long distance touring by motorcycle may involve both on-road and off-road riding

Motorcycle sports and leisure offer numerous opportunities to effectively reach and influence the motorcycle enthusiast regarding road safety. Firstly, the sports environment leads to greater interest to choose and equip the rider with state-of-the-art PPE, to keep a well-maintained vehicle and to improve riding skills. A sports environment can also impart the importance of rider planning, or the 'systematic approach' to safe riding. Off-road sport can be of enormous help in imparting machine control skills.

The opportunity to improve riding skills on tracks and in off-road environments enables riders to test the limits of their own and their vehicle's abilities under safe conditions. In many regions of the world, manufacturers and sports federations organise track-days and off-road tours allowing enthusiasts to improve their skills with the support of professional coaching. These sports activities have been a strong contributor to introducing a safety culture among riders and in promoting advanced riding skills. PTW sports also contribute to the development and promotion of cutting-edge PPE, such as the motorcycle airbag jacket.

Preventing impaired riding

Impaired riding includes riding without a proper license and riding under the influence of alcohol or drugs. Alcohol or drug consumption, by reducing awareness and inhibition, is considered among the major causes of road casualties according to the WHO.

- **Sweden:** Alcohol or other illegal drugs are stated as an important cause of PTW accidents in up to 30%[30] of the cases.
- **USA:** Of 5,932 motorcyclists involved in fatal crashes in the USA in 2021, 28% were under the influence of alcohol (Blood-Alcohol Concentration of more than .08 g/dL28); 36% percent of motorcycle riders involved in fatal crashes in 2016 in USA were riding without valid motorcycle licenses[31].
- **South-East Asia:** Alcohol is also a key issue in some Asian countries, e.g., in Thailand, where alcohol was involved is about 21% of PTW fatalities (Data 2020)[32].

Use of helmets and protective gear

IMMA strongly encourages riders and passengers to wear certified PPE, including helmets, and to comply with the legal requirements in their particular region. Wearing a helmet of a proper quality standard, and in the proper way, can reduce the risk of death by 40% and the risk of serious injury by over 70%.[33]

Helmet sticker campaigns address concerns around fastening the chinstrap correctly (various countries)

Despite the high safety value of helmets, the creation and enforcement of helmet laws should not be regarded as a simple political 'fix' for PTW safety. In isolation, such a policy can only mitigate the consequences of an accident rather than preventing the collision in the first place.

Choosing a helmet should be at the discretion of the rider: it is their responsibility to select the adequate type and size fitting with their specific use, climatic and economic considerations.

In countries where helmet wearing rates are very high, emphasis in education and enforcement campaigns should be placed on the correct usage of helmets, with the chinstrap fastened correctly. Such actions need in general to be repeated and the effects and impacts measured.

[30] TRAFIKVERNET
[31] https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813466
[32] Thailand Accident Research Center (TARC)
[33] "Global status report on road safety 2013: supporting a Decade of Action", World Health Organisation.

Diversity in the approaches taken also needs to be recognised. For example, in some of the ASEAN countries, governments are considering the development of an alternative specification of helmets, which are lighter and could be considered more appropriate for use in hot and humid climates.

While protective gear by itself will not prevent a collision, good quality gloves, footwear and basic eye protection can do much to mitigate the effects of one. Rider choice will vary according to specific needs and the different climatic conditions around the world. IMMA promotes the safety benefits of using a range of protective garments.

- Europe: Analysis of the MAIDS database showed that for light and medium weight garments, protective equ-ipment was effective in preventing or mitigating injuries in 73% of all cases. In the case of heavy garments, protective equipment was effective in preventing or mitigating injuries in 93% of all cases.
- USA: NHTSA estimates that helmets saved 1,872 motorcyclists' lives in 2017, and that 749 more lives could have been saved if all riders had worn helmets. *(Note: this information has not been updated in the annual reports since 2017)*[34].

Detection of PTWs and their riders by other vehicle users

Other road users often fail to see PTWs approaching. This is thought to be due to the smaller area a PTW presents to the eye, unlike a bus or truck. Various research has also shown that in many instances, road users are not expecting to see PTWs and therefore don't notice them against a complicated background of other vehicles, road infrastructure and immediate hazards. This is known as the 'looked but failed to see' phenomenon.

Other vehicle drivers, who also have a motorcycle licence, are much less likely to commit a perception failure in relation to the oncoming motorcycle (or misinterpret its distance and speed) than 'other vehicle' drivers who do not have a motorcycle licence. This finding was re-confirmed in the study conducted by VIAS&KFV in 2018[35]. It shows clearly the differences between dual drivers (automobile drivers with motorcycling experience) and automobile drivers:

- Dual drivers have different visual strategies and are better in predicting potential conflicting events.
- Dual drivers are constantly aware that a motorcycle might approach, and they know which manoeuvres can be expected from motorcycles.

This risk can be mitigated by training drivers to look for PTWs when approaching junctions or other hazardous areas. Some of this training can come from automobile drivers having motorcycling experience[36]. Some of the solutions the industry is looking into are C-ITS. C-ITS involve communication technologies to increase the conspicuity of PTWs, by assisting the other vehicle drivers and PTW riders to identify and recognise other vehicles.

[34] https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813466

[35] See 'Detection of motorcyclists by automobile drivers with and without motorcycling experience. A virtual reality driving simulator study including eye-tracking (MOVIT)' by Sofie Boets, Charlotte Desmet, Daniela Knowles, Alexander Pommer and Martin Winkelbauer (Vias & KFV), presented at IFZ-2018-Cologne, October 2018.

[36] See also 'Detection of motorcyclists by automobile drivers with and without motorcycling experience. A virtual reality driving simulator study including eye-tracking (MOVIT)' by Sofie Boets, Charlotte Desmet, Daniela Knowles, Alexander Pommer and Martin Winkelbauer (Vias & KFV), presented at IFZ-2018-Cologne, October 2018.

Passenger safety

Passengers should be able to reach the footrests provided

There is increasing attention on the safety of passengers, particularly in Asia and Latin America. Again, there is wide variation in regulation and practice both between countries and between urban and rural areas.

Though the number of crashes involving PTW passengers is relatively low, some crash investigation studies indicate that passenger behaviour may contribute to the cause of a crash, hence it is important that they are prepared and briefed properly by the rider before mounting a PTW.

A key factor in passenger safety is that all riders should wear a helmet and their feet should be able to comfortably reach the footrests. The fit and maturity of the passenger should be used as a legal determinant, rather than age or any other arbitrary factor.

Regular maintenance of vehicles

Periodic inspections reduce the incidence of safety related defects to tyres, brakes and lights, particularly those of which the owner may be unaware. Regular checks of vehicles would possibly have a much greater impact in LMICs, where running damaged or dilapidated vehicles can be common.

Countries developing an inspection regime should adapt regulations to meet national characteristics and needs. For example, the very highest standards of Periodic Technical Inspection (PTI) regimes may not be appropriate in territories where there are economic challenges and the ability of users to afford costly in-depth technical inspections is low. In such cases, a PTI regime for PTWs should focus on a basic inspection of the operation of vehicle's safety-critical items, such as tyres, brakes, steering, suspension, lights, etc. Such PTI regimes can develop as the local situation evolves in a positive economic and social direction.

IMMA member manufacturers provide technical support through their service channels available in each market and recommended service intervals for the optimal performance of the vehicle.

3.4 HARMONISED VEHICLE REQUIREMENTS AND TECHNOLOGY ADVANCES

Product safety is of utmost importance for IMMA members

When developing products, manufacturers strive to achieve the highest standards of construction and technology, considering specific aspects for different global markets. New products are subjected to a series of stringent tests and quality management systems that aim to protect the safety of riders and improve environmental performance. To implement increasingly advanced regulatory and industry standards, manufacturers resort to enhanced designs, refined construction methods and advanced technologies.

Industry has been driving advances in preventative, primary and secondary safety

Preventative safety aims at improving riding and driving standards. Primary safety refers to functions such as vehicle stability, braking, traction control, innovative ergonomics and chassis designs that improve the rider's control of the vehicle.

Industry has also developed and successfully introduced various secondary (passive) vehicle safety improvements. However, due to the specific nature of two-wheeled vehicles, such as the exposed position of the rider, the possibilities for secondary safety on the vehicle are limited and very complex. However, it is worth noting that the use of appropriate PPE has a big influence on the mitigation of severe injuries in the case of an accident.

With evolving technologies, additional competencies have been developed by industry that address on-vehicle solutions and on-rider solutions. An example of an on-vehicle solution is the Rear-End Collision Alert Signal (RECAS).

As various studies from around the world have demonstrated, in several regions, the majority of PTW accidents are caused by the driver of the other vehicle who 'did not see' the PTW rider. Conspicuity has been and is continuously being improved through advances in vehicle daytime and night-time lighting technologies. Conspicuity is also anticipated to be addressed in the future through electronic devices, whereby the PTW (rider) can be "seen" by the other vehicle through C-ITS.

Technological developments

The PTW industry has a significant record in developing and introducing a wide spectrum of improvements on vehicles. These include:

- Vehicle lighting technologies
- Braking systems
- Ergonomic design of rider position and controls
- Use of light and durable materials
- Design and construction of the vehicle frame
- Intelligent Transport Systems, vehicle detection systems and technologies (C-ITS, ARAS)
- Innovations improving overall vehicle stability
- Suspension, tyres, fuel system integrity

Advanced rider control features to easily navigate the dashboard functions

Further to the above, numerous innovations have emerged with regards to the vehicle drivetrain and environmental performance. To ensure that these innovations can be introduced in the global marketplace, the industry actively engages in collaborative efforts through IMMA to develop new and updated international standards and UN Regulations.

Vehicle lighting

State-of-the-art technology allowing unique front lighting signatures

Vehicle lighting technology is subject to rapid evolution. The industry has been deeply involved in adapting these technologies to PTWs to improve rider vision and conspicuity, visibility and the lighting signature of PTWs. In addition, various specific concepts for PTWs have been introduced to provide additional lighting to increase vision for the rider during banking/leaning of the vehicle.

Thanks to the increasing spectrum of lighting technologies, including advanced ones such as LEDs, the lighting signatures, conspicuity and vision during different environmental conditions are constantly improving.

Conspicuity - being seen and perceived correctly and timely - has been identified by various studies as a very important factor to prevent PTW accidents. The usage of Automatic Headlamps On (AHO) or Daytime Running Lamps (DRLs) on PTWs are an effective measure to increase conspicuity proven by the wide scale adoption of DRLs on cars.

Activation of additional lighting units to illuminate the bending road

Headlamp-on riding has generally been considered an important measure to improve individual safety in most regions in the world. The promotion of this measure by IMMA resulted in its formal introduction in the 1968 Vienna Convention on Road Traffic[37]. The AHO system ensures that the front light is automatically turned on when the engine runs. To include AHO as a global standard for PTWs, the WP.29 has updated vehicle lighting legislation with corresponding specification, following proposals by IMMA.

Manufacturers continue to develop and introduce additional lighting solutions, with these applying to specific vehicle types and/or to meet local market needs and conditions.

Key examples of recent lighting system innovations are:

- Cornering light or bend lighting option. This involves activation of additional lighting units in conjunction with the driving beam to improve the road illumination in the direction of the vehicle.
- The Rear-End Collision Alert Signal (RECAS), which provides an automatic signal by means of the direction indicators when the motorcycle detects an imminent collision from the rear, to prompt the driver of the vehicle behind the motorcycle to take immediate action with the ultimate goal of avoiding a crash or, at least, mitigating its consequences.
- The Adaptive Driving-Beams (ADB) on motorcycles, which contribute to enhancing road safety, not only for motorcycle riders but also for other road users. The adaptation of the driving-beam to the preceding and oncoming traffic will improve the forward visibility of motorcycle riders, without causing discomfort, distraction or glare to other road users.

[37] The 1968 Convention on Road Traffic is the key legal instrument forming the basis for the majority of traffic rules around the world. There are 78 Parties to the Convention, in Europe, Africa, the Middle East, Asia and Latin America, with Nigeria being the latest country to join in October 2018. By acceding to the Convention, countries agree to transpose uniform 'rules of the road' in their domestic traffic legislation for safe driving behaviour.

It should be remembered that PTW conspicuity is strongly related to the behaviour of riders. Whether or not the rider is seen largely relates to the observational skills and behaviour of riders and drivers of other vehicles and to aspects of behaviour and situational and predictive awareness of the PTW rider. Examples of issues that impact conspicuity are: the position of the PTW in the traffic lane, the distance of the PTW to other vehicles within the lane and differences in speeds between the PTW and the surrounding traffic.

Front wheel disk brake fitted with ABS

Braking

The PTW industry has developed and introduced several braking technologies, enhancing the effectiveness of these devices and adjusting them to specific manoeuvres and needs. Advanced braking systems encompass different systems, technologies and approaches, such as Anti-lock Braking Systems (ABS) acting on one or both wheels, Combined Brake Systems (CBS), Rear-wheel Lift-off Protection (RLP) and automatic brake force distribution. Such systems can be present individually or in combination.
To introduce a global regulatory framework for braking, encompassing advanced braking systems, IMMA has led the discussion on the creation of a new Global Technical Regulation (UN GTR) on PTW braking under WP.29.

In diverse markets, such as Europe, Japan, India, Australia, and the Republic of China (Chinese Taipei), ABS has become standard on new types of PTWs with an engine capacity of 125 cc and above, while for vehicles under 125 cc, manufacturers have the option to equip the vehicles with a CBS or ABS. Other markets, such as China, Brazil and Malaysia identify other specific vehicle categorizations for equipping PTWs with mandatory ABS, based on the local situation.

While the potential benefits of ABS are considerable, it should be remembered that the benefits and limitations of various advanced braking systems vary significantly per type of PTW. It is also important that riders are taught to use the full potential of PTW brakes in a proper way, as advanced braking systems can lead to over-confidence among some riders.

Also, the typical riding environment and patterns of riding can have a strong impact on the effectiveness of an ABS. This can often be the case in relation to off-road environments, or roads which are constructed mainly of dirt, gravel or ‘piste’. Manufacturers have to consider factors such as customer expectations, regulatory requirements, intended vehicle usage costs and the primary road infrastructure when determining which types of systems to offer for a given vehicle in each market.

IMMA additionally emphasises the importance of the education of riders on the benefits and limitations of advanced braking systems. Without proper training, the introduction of advanced

braking technology may lead inexperienced riders to demonstrate over-confident behaviour which can reduce or eliminate the desired safety benefits[38].

Holistic perspective

As noted in the examples above, IMMA and its associated manufacturers have a track record of advancing vehicle technology and performance.

However, providing PTWs with additional vehicle related options or technologies, or introducing vehicle specific regulation, is not on its own enough without strong and continued focus on rider training and the behaviour of the rider. Adequate vehicle maintenance by the owner and attention to the quality of the road infrastructure by public authorities is also vital.

Consequently, IMMA member associations and manufacturers have been investing in educating customers and promoting new safety solutions. In addition, IMMA members have been active in promoting PTW road safety with policy makers and undertaking collaborative research on a regional or global scale.

Intelligent Transport Systems (ITS)

Research into advanced technology applications on vehicles could improve motorcycle safety

In addition to the extensive efforts within PTW manufacturers' in-house R&D departments, there are numerous global non-PTW-industry collaborative initiatives. These are aimed at developing cooperative or standalone technologies, undertaking pre-competitive research and promoting standardisation.

PTWs should not be forgotten or overlooked whenever ITS are considered in road infrastructure upgrades, and in work on other vehicle types like automobiles and trucks. The application of advanced technologies to PTWs, as well as the impact of advanced technologies on PTWs, should be considered at the initial design stage.

As with Rider Assist Systems, the fitment of ITS on PTWs can be a complex challenge. The application of such technologies on PTWs is in most cases far from a simple 'carry-over' from automobile technology. This is because the characteristics of PTWs (vehicle size, use, weight, space, balance, dynamics, handling, usage environment) vary considerably and often require many specific adaptations before being applied to PTWs.

[38] NHTSA automotive ABS effectiveness study for four-wheelers, - http://www-nrd.nhtsa.dot.gov/Pubs/811182.PDF

Cooperative systems and the Connected Motorcycle Consortium

PTW safety, comfort and environmental performance may be further enhanced via vehicle-to-vehicle and vehicle-to-infrastructure communication (V2X). Additional communication frameworks are expected to improve safety in critical scenarios for PTW riders (intersections, blind spots, rural roads, poor visibility areas, etc.).

In the long term, vehicle-to-vehicle and V2X will potentially address many common PTW accident configurations (approximately 50% of PTW European accidents occur at an intersection according to MAIDS) and they may offer solutions in certain cases where conspicuity plays a critical role. However, there is a need to include PTW-specific safety aspects.

The motorcycle rider gets a information on the HMI about a possible conflict with another vehicle when overtaking

The Connected Motorcycle Consortium (CMC) (www.cmc-info.net) is a collaboration between manufacturers, suppliers, researchers and associations to make PTWs part in the future of connected mobility. An important goal set out by CMC was to define a first Basic Specification for motorcycles to connect and 'talk the same language' to other vehicles or infrastructure by means of wireless communication. This included a set of documents to address topics related to the introduction of C-ITS for motorcycles, such as:

- Accidentology
- Application and use case definition
- System specification
- Testing and evaluation
- Requests to other industry standardization bodies
- Application strategy
- Human Machine Interface (HMI)

In its 2nd phase, the CMC investigated the level of conspicuity of motorcycles by ADAS systems. This system approach looks at the potential of on-board sensor systems and connectivity.

The Connected Motorcycle Consortium is now heading for its 3rd phase. This includes further research on key factors to reduce motorcycle accidents. A revision of the CMC 'Basic Specification' will be the result of the various activities planned in this 3rd phase. Cooperation with infrastructure stakeholders is envisaged as well as extended cooperation with other vehicle makers towards deployment.

Connectivity allows informing a car driver of an oncoming motorcycle

PTWs should always be detected irrespective of the level of automation of other vehicles

Modern cars are increasingly equipped with on-board sensor systems (radar, camera, etc.) and driver assistance systems. These vehicle systems need to include motorcycle specifics to enhance their safety effects to ensure they are as effective towards PTWs as for cars. ITS technologies have the potential to increase as well as decrease crash injury risk through introducing driver distractions and changes of behaviour.

Governments should require repeatable, and evidence-based measures to ensure that vehicles meet public expectations on crash avoidance and ensure the safety of users and the public.

While development and field testing of highly automated vehicles is accelerating in different regions, the best methods and strategies for assuring safety have yet to be determined. As the use of PTWs varies significantly per region, extensive scientific studiesare required considering regional differences.

When considering the development of highly automated vehicles, the principle of equity and coexistence of different vehicle types in mixed traffic should be respected. Roads are shared by a wide variety of road users, and PTWs should be detected in all traffic conditions by vehicles equipped with advanced technologies and by their drivers.

World Forum for Harmonisation of Vehicle Regulations (WP.29)

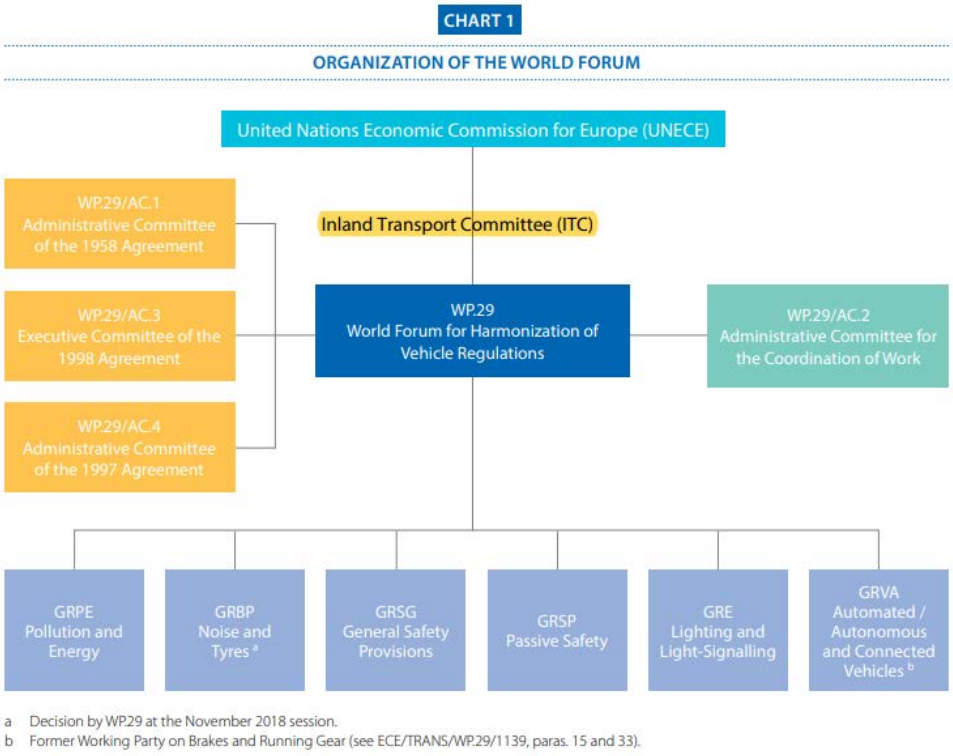
IMMA has been involved in the World Forum WP.29, a UNECE body for the development and maintenance of regulations, since its inception. IMMA strives to ensure that the process of rulemaking in which all decisions are taken by governments, is facilitated through the provision of technical information, discussion and scientific data, resulting in the development of technical legislation to appropriate levels.

The work of WP.29 and especially the 1958 Agreement and 1998 Agreements have accelerated the fitment of cutting-edge technologies for safety and environmental performance across different markets and allowing the markets to grow and become part of a global marketplace.

When considering implementation of new technologies in legislation, policy makers should recognise the regional diversity of PTWs, the users and their types of usage, as well as the great variation in road infrastructure, traffic conditions, and stages of economic development.

In some cases, before new technologies are considered for mandatory application by government administrations, the application of the latest international standards and regulations should be the first step.

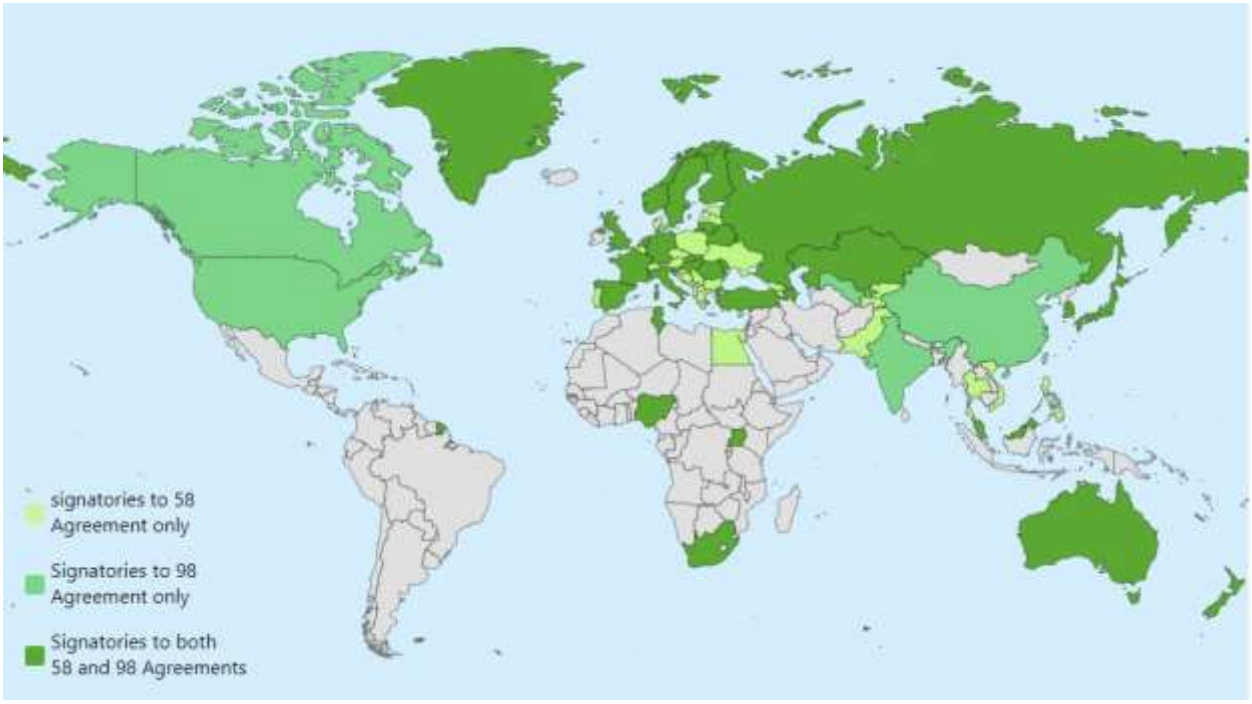
Whilst technical advances in PTWs will continue to play a role in rider safety, the primary focus must be placed on public policy development, rider behaviour and safer roads for riders.



Source: unece.org/wp29-introduction

IMMA believes WP.29 should promote global harmonised technical regulations on safety and environmental performance. The creation of globally harmonised markets would lead to more efficient PTW production and help manufacturers roll-out new technologies more quickly. This would improve vehicle safety and bring additional benefits to end users. The organisation of WP.29 is illustrated above.

IMMA calls on countries who are not yet signatories to the instruments managed by the World Forum, such as the 1958 Agreement and 1998 Agreement, to join WP.29, accede to the agreements, and adopt worldwide regulations for safety and environment.



In April 2024, the 1958 Agreement counted 60 Contracting parties and the 1998 Agreement counted 40 Contracting parties (source UNECE)

Counterfeiting and PTW safety

As a result of globalisation, economic development and rapid motorisation in various emerging and LMICs, manufacturers and consumers face complex issues related to Original Equipment Manufacturer (OEM) items and counterfeit products.

Today, trade in counterfeit products is reaching epidemic proportions, particularly in LMICs, which are highly price sensitive. Customers can be easily attracted by low cost, but low quality, counterfeit spare parts marked illegally with well-known global brand names designed to mislead customers. Counterfeit products, being cheaper, are usually made of low-quality raw materials and rarely go through any safety tests or quality certification. The most commonly counterfeited spare parts are those which are fast moving in the aftermarket and those which are frequently replaced, such as all types of filters, spark plugs, brake pads, clutches, suspension items, electrical items etc.

Consumer awareness should be raised on the dangers of fitting very low cost counterfeit parts and vehicle components. Genuine parts, such as this shock absorber, go through rigorous safety and durability testing

Often the customer either cannot distinguish between OEM or counterfeit parts or is not concerned by it. However, these customers may not fully understand the adverse impact counterfeit spare parts may have on other vehicle systems, vehicle performance, environmental and legal compliance and ultimately on their own road safety.

Consumer awareness is the key to eliminating this problem. OEMs have started regular campaigns and various outreach programs in educating influencers and end consumers on the benefits of using genuine parts. Many of these manufacturers have hired agencies specialised in Intellectual Property Rights (IPR—e.g. trademarks and copyright) protection to identify infringements and support the authorities to conduct raids on outlets manufacturing and/or selling counterfeit parts.

To protect customers from accidents caused by counterfeit products of inferior quality and safety, IMMA emphasises the importance of enforcement measures to prevent the marketing, distribution, sale and use of either non-compliant, or unsafe PTWs and their parts, or those in which IPRs are infringed. In parallel, those efforts must be intensified to increase public awareness of IPRs and the seriousness of IPR infringements, as counterfeiting puts in danger consumer's health and safety.

4. Safety Performance and Monitoring

4.1 Monitoring Methodologies

Harmonised data is essential for the analysis of global trends or patterns of progress. With 80 members and observers from more than 40 countries, IRTAD has become a central force in the promotion of international co-operation on road crash data and its analysis. In recent years, significant progress has been made by IRTAD and OISEVI (Ibero-American Road Safety Observatory) to harmonise definitions, collect and exchange road safety data. As a member of IRTAD since 2012, IMMA continuously appeals to governments of LMICs to adopt harmonised methods and to collect adequate road safety statistics. Care should be taken when comparing the performance between countries due to the major differences in the actual traffic context or traffic mix in the regions such as different use of PTWs, state of the infrastructure, driver licensing schemes, and climate conditions. Data collection efforts, definitions and methods are also very different between regions.

The absence of data relating to distance travelled by different vehicle modes is a very serious deficiency. This means that accurate records of casualty rates per distance travelled, the most accurate measure of relative safety, continues to be unavailable. Analysis of only the absolute number of fatalities can lead to misinterpretation and inadequate comparison as the growth or decline of the riding population is not considered.

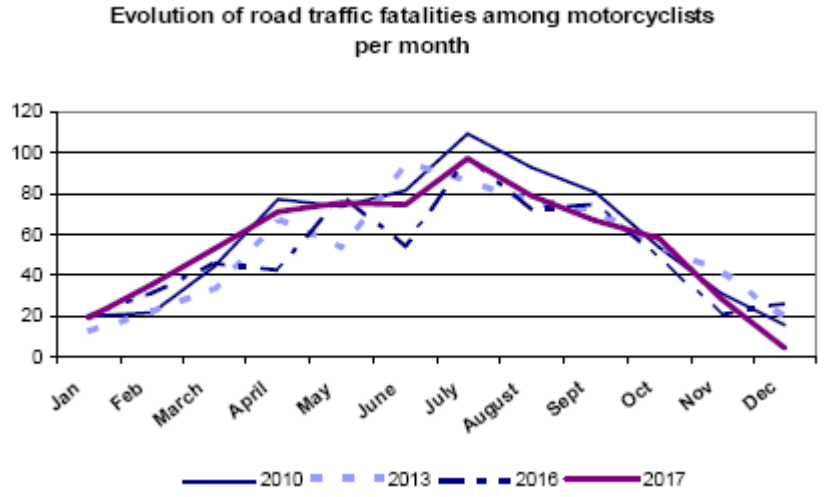
Recommended indicators for studying PTW safety trends:

- PTW type of usage (e.g. daily commuting, or utility, majority leisure)
- The trend and absolute number of fatalities and number of registered vehicles (circulating parc) by category of road users (including different types of PTW)
- The trend and absolute number of kilometres/miles ridden by the different categories as exposure risk data. When details on distance travelled are not available, the ratio of riders killed per 10,000 circulating PTWs will provide insight to identify trends

Some riders travel large distances on their motorcycle

- Information on seasonal and weather-related aspects of motorcycling which may have a significant impact on exposure and hence, the number of crashes.
- Specific behaviour of the PTW rider population, e.g. the wearing of certified PPE; with statistics on helmet wearing, related policies and general use of approved helmets

- Results of awareness raising campaigns combined with targeted enforcement actions.
- Caution is advised when comparing the PTW road safety situation in one country/region with other localities, countries or regions, because the context of PTW use, PTW type, distribution, road condition, infrastructure, economics, social factors and regulatory framework can be very different. For example, across Africa, differences may be significant in the use of PTWs, due to local circumstances.



French Road Safety Observatory ONISR, 2017

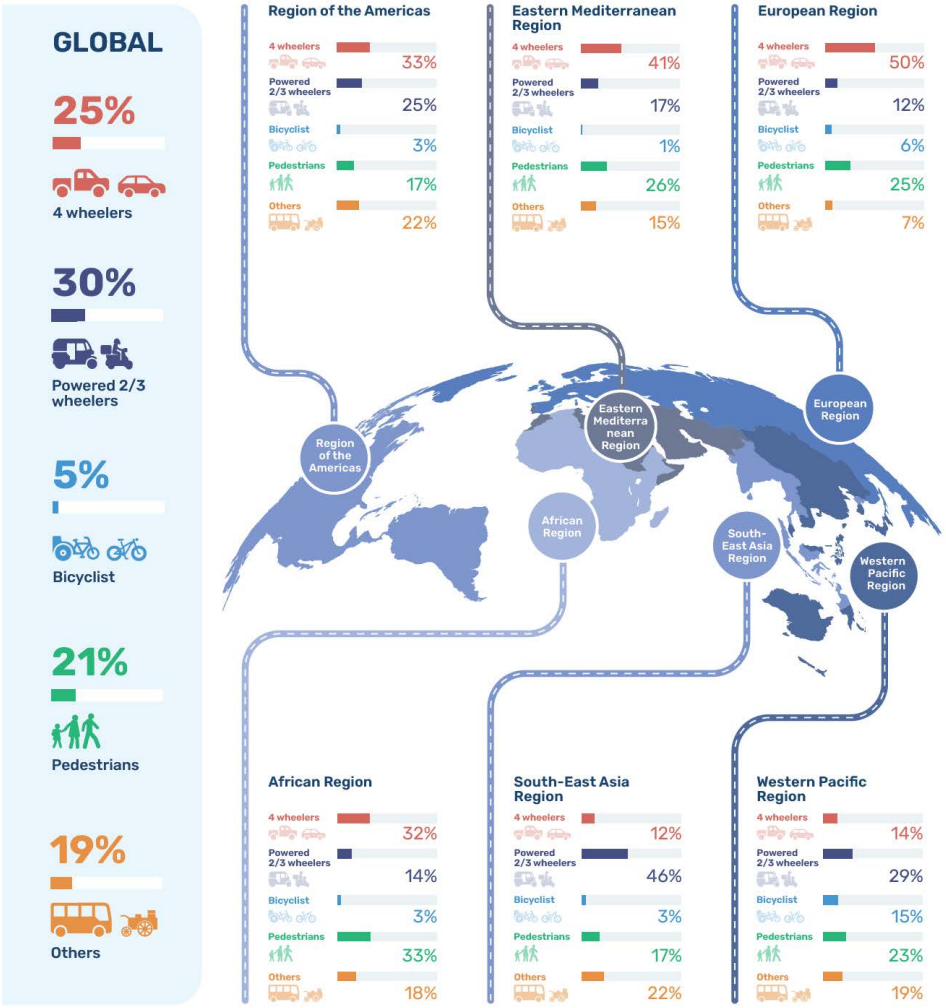
4.2 PTW SAFETY TRENDS

The WHO reported that the fleet of PTWs increased between 2011 and 2021 by 107% noting that the safety per vehicle level improved, but that the PTW share of traffic fatalities globally increased to 30%. in 2021. Hence, urgent action is required to implement the four-step approach involving all stakeholders.

An improvement in PTW fatalities per 100.000 vehicles is observed between 2010 and 2021 in most countries and in most regions, a significant growth of the fleet of PTWs in traffic is also observed.

WHO, Global Status Report on Road safety, 2023:
"Despite the increase in deaths among powered two- and three-wheeler users, a substantial decline can be seen in annual fatality rates per 100 000 vehicles, from 79 deaths per 100 000 vehicles in 2010 to 47 deaths per 100 000 vehicles in 2021 – a 41% reduction."

Fig. 1. Percentage distribution of country-reported deaths by road user type and WHO region, 2021



Global status report on road safety 2023. Geneva: World Health Organization; 2023. Licence: CC BY-NC-SA 3.0 IGO.

[39] Global Status Reports on Road Safety by WHO, 2013, 2023

4.3 NEED FOR IN-DEPTH STUDIES AND NATURALISTIC RIDING STUDIES

In-depth studies help us to better understand the various causes of PTW accidents and may allow some estimate of the effects of introducing new technologies, new licensing and training schemes, as well as new PTW-friendly infrastructure.

Examples of key in-depth studies:

The European MAIDS project was an extensive in-depth study of motorcycle and moped accidents during the period 1999-2000. Data collection took place in five areas in France, Germany, Netherlands, Spain and Italy, using the methodology from the Organisation for Economic Co-operation and Development (OECD) for onscene in-depth motorcycle accident investigations. A total of 921 accidents were investigated in detail, resulting in approximately 2000 variables being coded for each accident. MAIDS was co-funded by the European Commission. Further details and the report can be found here: https://www.maids-study.eu/

The **Thai Accident Research Center (TARC)** investigation study[40] involved a total of 1001 motorcycle crash cases collected during the period 2016-2020. The objective of the study was to conduct in-depth crash investigation to understand crash patterns, characteristics and identify contributing factors to such crashes in Thailand.

To validate the representativeness of in-depth motorcycle crash data studies, exposure data are needed. Naturalistic riding studies are an essential tool for collecting and analyzing exposure data on PTW rider behavior and trajectories to identify risk factors. If combined with in-depth crash investigations, such studies can also be used for the evaluation and design of, for example, training programs, Human Machine Interfaces (HMI), or road signage.
Lastly, to isolate the most prevalent behavior and causes of accidents in any country, localized studies are required.

[40] http://www.tarc.or.th/

CLOSING REMARKS

Ensuring the safety of PTW riders is essential to successfully reduce the total number of global road fatalities. This can most effectively be done by adopting an integrated, comprehensive approach which encompasses mainstream transport policy, infrastructure improvements, advances in vehicle technology, law enforcement and education and training for all road users.

This paper has set out the key elements that, taken together, comprise an effective and sustainable approach to PTW safety. Adopting, in full, the Four Stage Strategy offers a realistic opportunity to address safety within the holistic context of urbanisation and transport policy. It will allow the greatest chance of securing safety improvements, while at the same time realising the PTW opportunity that exists in relation to transport networks and citizen mobility.

This document was developed by the IMMA Road Safety Working Group. The first edition appeared in 2014, with revisions and updates in 2019 and 2024.

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- Mr Edwin Bastiaensen, IMMA SG (in memoriam)

ANNEX 1: COMPILATION OF BEST PRACTICES FROM THE REGIONS

INTRODUCTION

A wealth of global knowledge exists on PTW safety, which should be shared and implemented, with suitable local adaptation. IMMA has pooled the extensive knowledge and resources that exist across the world to create a shareable resource for global institutions, governments, public authorities and other stakeholders with an interest in improving PTW safety.

The best practices contained below cover industry-led initiatives in safety and transport policy and awareness, training and education. They have been developed by IMMA members in collaboration with public authorities, by industry, by governments themselves, or by a mixture of these. The initiatives all fit within the principles of the Four Stage Strategy.

1. ABRACICLO (Brazil)
    - Projeto Faixa Azul, São Paolo – Brazil
2. ACEM (Europe)
    - European Motorcycle Training Quality Label – Europe
    - "Motorcycle: Certainly Safe!" campaign – Germany
    - FORMACIÓ 3.0 Project – Spain
    - Road Audit from The Motorists' Perspective – Spain
3. AISI (Indonesia)
    - Introduction PTW Safety Riding - Indonesia
4. JAMA (Japan)
    - Motorcycle Day - Activities to Promote Safe driving Of Motorcycles – Japan
    - Educational Road Safety Video – Japan
5. MotoCanada (Canada)
    - Motorcyclists Confederation – Canada
6. MSF (USA)
    - Motorcycle Safety Campaign – USA
7. MASAAM (Malaysia)
    - Balik Kampung Road Safety Campaign (BKRSC) – Malaysia)
8. MDPPA (Philippines)
    - Generation Road Safety – The Philippines
    - 2nd ROAD SAFETY SUMMIT – The Philippines
    - Search for the best delivery rider – The Philippines
9. SIAM (India)
    - "सुरक्षित सफर" (Surakshit Safar - Safe Journey) - Road Safety Initiative - India
10. TAIA (Thailand)
    - Society Helmet Project - Thailand
    - Accident Prediction Training (APT) – Thailand
11. VAMM (Vietnam)
    - Training on Road Traffic Law and Safety Riding Skills – Vietnam

PROJETO FAIXA AZUL, SÃO PAOLO – BRAZIL

Introduction

The Faixa Azul (Blue Lane) is a road infrastructure safety measure specifically designed for motorcycles in São Paulo, Brazil, first realized through a pilot in 2022. The primary goal has been to promote a more harmonious and safer traffic environment by re-organising the shared space between cars and motorcycles on the road.

Summary of the Initiatives and Activities Developed

The opening was on October 6th, 2022 on a stretch of 13km with significant motorcycle traffic (Av. Dos Bandeirantes), introducing the Faixa Azul (Blue Lane) between the first and second vehicle lanes. Motorcycles were not obliged to use the Faixa Azul but are recommended to use the blue marked lane during periods of congestion or conditions of heavy traffic and comply with the posted speed limits (30 km/h in congested traffic). The blue color was chosen for its psychological association with tranquility and safety, reinforcing positive behavior. The project was implemented by Traffic Engineering Company (CET), with approval from the federal agency. IMMA-member Abraciclo played a pivotal role in advocating for motorcyclists' safety and collaborating with authorities to implement the Faixa Azul pilot project in São Paulo.

https://www.cetsp.com.br/consultas/faixa-azul/informacoes-gerais.aspx

Results Achieved

After two+ years of Blue Lane implementations in the city of Sao Paolo, there have been no recorded deaths of motorcyclists in the areas where it has been implemented. With the recent additional stretches and extensions, a total of 89.1 km was equipped with the measure in 2024.

According to the data collected, the chance of being involved in an accident using the blue lane is 133% lower than in a regular lane.

EUROPEAN MOTORCYCLE TRAINING QUALITY LABEL – EUROPE

Introduction

The European Motorcycle Training Quality Label is an easily recognised symbol that helps riders to identify the highest quality advanced safety training programmes in Europe. The PTW industry encourages continued outreach to new and existing PTW riders on the importance of life-long training including post-licence voluntary training.

The initiative is a key element of the European industry road safety strategy and an excellent example of how industry players, NGOs, motorcycle trainers and users' organisations can work together for motorcycle safety.

Summary of the initiative and activities developed

A certified post-licence training training is guaranteed to be safety orientated, to have qualified trainers and based on recognised training methodology. The Quality Label is granted for a period of 4 years. Annual verification ensures continued high standards. The awarded programmes gain high visibility, paving the way for higher quality standards and increased demand for continuous education and training of PTW users. All awarded schools work together to create a high-quality training concept. This concept will cover various levels of motorcycle riding skills, hazard and safety awareness.

Launch event, ACEM Annual Conference, 2016 First labelled programme:
Early perception risk, Dutch riders' organisation (KNMV)
Left to right: Antonio Avenoso, European Transport Safety Council, Alisa Tiganj, Member of Cabinet, European Commissioner for Transport, Jacqueline Lacroix, German Road Safety Council, Arjan Everink, Dutch riders' organisation KNMV, Stephan Schaller, Former BMW Motorrad and Former ACEM President; Antonio Perlot, ACEM

Results achieved

- There are currently 35 certified programmes in 11 European countries: Austria, Belgium, Cyprus, France, Germany, Greece, Italy, the Netherlands, Portugal, Spain and Sweden, with more motorcycle training centres expected to join in 2024.
- This scientifically based activity is strongly supported by numerous academiac experts and researchers.
- Received European Road Safety Charter Award in the category "Voluntary commitments" from the European Commission in 2019

https://roadsafetystrategy.acem.eu/home/the-european-motorcycle-training-quality-label

https://motorcycle-training-label.eu

"MOTORCYCLE: CERTAINLY SAFE!" CAMPAIGN – GERMANY, EUROPE

Introduction

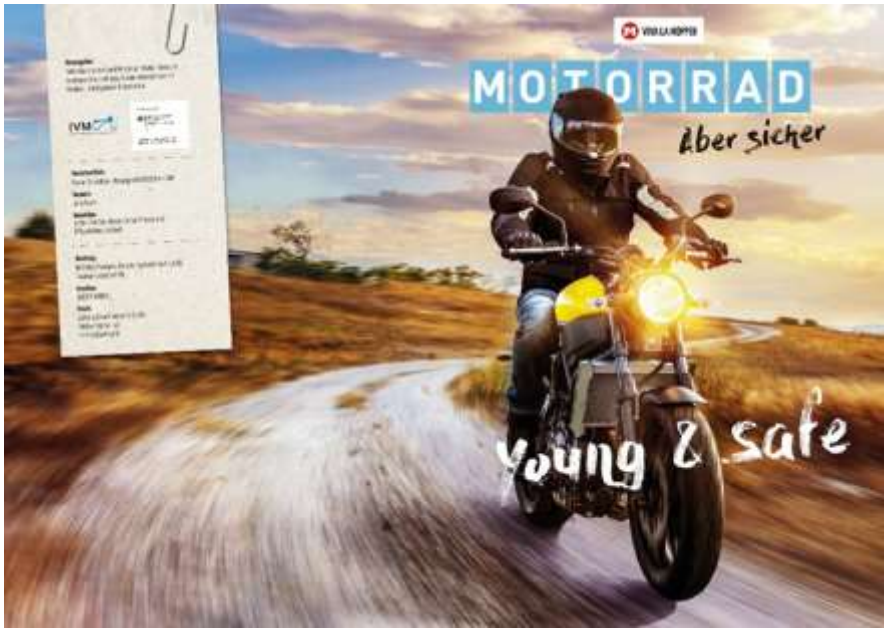
"Motorcycle: Certainly safe!" builds upon years of experience in promoting responsible rider behaviour and represents one of the most comprehensive safety platforms in Europe.

Summary of the initiative and activities developed

The German industry association has been deploying a Facebook community platform named VivaLaMopped since 2010. Based on this platform, the project "Motorcycle: Certainly safe!", was developed in 2015 to address motorcycle safety, supported by the German Federal Ministry of Digital and Transport. It has done so ever since through written information, videos, blogs and podcasts. The project developed into an online encyclopedia on motorcycle safety for both riders and the professional community, covering topics as advanced rider assistance systems for motorcycles, protective clothing, the right way to ride curves, etc.

Results achieved

- The project reached more than 56 million impressions a year on Facebook, Instagram, YouTube and Google; and over 10 million video views.
- The new TikTok platform "Motorcycle: Certainly safe!" reaches young people in particular, leading to even higher numbers of contributions, with over 10 million views on TikTok alone of the latest 25 short videos on motorcycle safety.



Motorcycle: Certainly Safe! Campaign – online encyclopedia on motorcycle safety

https://vivalamopped.com/motorrad-aber-sicher
https://www.instagram.com/vivalamopped/
https://www.tiktok.com/@vivalamopped

FORMACIÓ 3.0 – PROJECT – SPAIN, EUROPE

Introduction

Formació 3.0 is a project to promote advanced training for motorcyclists organised by Servei Català de Transit with the collaboration of ANESDOR since 2015. This project targets a user profile with a high incidence of road accidents: middle-aged and experienced motorcyclists.

Summary of the initiative and the activities developed

During the activity, the motorcyclist rides for about 20 minutes, accompanied by a monitor who records the movements of the motorbike. The images are then viewed to correct any mistakes made during the ride. The motorbike is also checked, and the rider is told what needs to be improved in terms of maintenance. At the end of the day, the recording is handed over to the user so that he can review and assimilate the information received and show it to his friends, thus increasing the possibility of spreading the advice received.

Results achieved

So far, 8 editions of Formació 3.0 have already taken place, in which more than 4,200 motorcyclists have been trained. In this latest edition, due to the success of the activity, Servei Català de Transit has increased the type of courses offered by the project (urban routes and courses for companies).

With regard to the urban sessions, the aim is to focus on users who use “smaller” motorbikes to get around in their daily life in an urban environment (7 pilot sessions have been held this year).

As for the company-oriented sessions, the aim is to train employees who use motorcycles to get to and from work or who use motorcycles to carry out their duties. Companies interested in this Formació 3.0 format consider these courses essential to avoid occupational risks.

ROAD AUDIT FROM THE MOTORISTS' PERSPECTIVE – SPAIN

Introduction

The Community of Madrid has made a guide that analyses how to carry out a road audit from the perspective of motorists.

Summary of the initiative and activities developed

With this document, the Community of Madrid aims to ensure that road audits in the region take into account a range of risks that could be a danger to motorcyclists. This document identifies different types of roads where special attention must be paid to elements that can be critical for motorcyclists: roads with a concentration of accidents involving motorcyclists, tourist routes frequented by motorcyclists and roads with accidents caused by motorcyclists leaving the road. There is also a specific section on the criteria for installing special protective barriers for motorcyclists.

Results achieved

This document represents a step forward in adapting infrastructure to the safety of motorcyclists, as roads are often designed exclusively for cars.

Although the document has only recently been published, the Community of Madrid plans to audit hundreds of roads in the community in the coming years, using the criteria set out in the document.

INTRODUCTION PTW SAFETY RIDING - INDONESIA

Introduction:

PTW manufacturers consistently engage in nationwide initiatives to promote rider safety. These efforts include well-attended exhibition events, which serve as effective platforms to not only educate the public but also encourage pre-riding check-ups for PTWs.

Summary of the Initiative and Activities Developed:

The Safety Riding Education for School and Public campaign, spearheaded by the industry, has gained widespread recognition as a prominent nationwide activity. In addition to members actively conducting regular training sessions, AISI consistently organizes safety riding courses and activities at major events such as IMOS (Indonesia Motorcycle Show) 2023. AISI and its members also play an active role in supporting government initiatives, collaborating with the Ministry of Transportation and the Police.

Results Achieved:

- In November 2023, 1,800 riders participated in the Gebyar Keselamatan (Safety Festival) 2023 organized as part of the Indonesian Traffic Police Activities.
- Throughout 2022, all safety events, including check-ups, were organized, attracting 99,737 participants.

PTW Safety Riding & Education in AISI Event, 26 October 2023, Tangerang, Indonesia

PTW Safety Riding Education Collaborate with Police Department, 18 November 2023, Tangerang, Indonesia

https://www.gridoto.com/read/223929881/hadir-di-imos-2023-korlantas-polri-berikan-edukasi-keselamatan-berlalu-lintas

https://www.rri.co.id/jakarta/berita-foto/1765/korlantas-polri-gandeng-komunitas-motor-tumbuhkan-kesadaran-keselamatan-berkendara

MOTORCYCLE DAY - ACTIVITIES TO PROMOTE SAFE DRIVING OF MOTORCYCLES - JAPAN

Introduction

In 1989, the traffic safety headquarters of the Cabinet Office set August 19 as Motorcycle Day with the aim of eradicating traffic accidents. Around this date, local governments and police hold seminars on safe driving of motorcycles nationwide.

JAMA holds events every year on this date, utilizing Motorcycle Day for motorcycle promotion and traffic safety awareness, with the support of government agencies such as the Cabinet Office and the National Police Agency.

Summary of the Initiatives and Activities Developed

In 2023, an event under the theme of “Have a Bike Day" was held in Akihabara, Tokyo. It was a comprehensive event aimed at raising awareness of traffic safety, improving riding manners and promoting the usefulness, convenience, and enjoyment of motorcycles.

Besides the exhibition of new vehicles, there were also on-stage talk shows featuring motorcyclist YouTubers and various off-site contests to promote the event to a wide range of people, especially the younger generation.

In terms of safety, along with the display of police motorcycles, there was a stage event by the Queen Stars of Tokyo Metropolitan Police Department to raise awareness about traffic safety. A traffic safety awareness video featuring a former WGP rider and Japan Riders’ ambassador was also used to directly reach out to the audience.

Results Achieved

There were about 2,000 visitors in total.

The event was picked up not only by motorcycle magazines, but also various online media and social media platforms, allowing the information to reach wide range of people from the general public beyond motorcycle users.

Closing ceremony by YouTubers and ambassadors with the audience

PRODUCTION OF AN EDUCATIONAL VIDEO - JAPAN

Introduction

JAMA conducted a five-year analysis of motorcycle accidents from 2016 to 2020, having found that the top types of crashes were collisions at an intersection when crossing (34%), and turn across path (opposite direction / turning right) (22%). Looking at motorcycle crashes against types of vehicles, 80% of all types of motorcycle crashes involve four-wheeled vehicles.

Summary of the Initiatives and Activities Developed

Based on the above results, JAMA produced a promotional video to raise awareness of safe driving. By reproducing the crash situations under actual mixed traffic environments from the perspectives of both motorcycles and four-wheeled vehicles, JAMA tried to clarify the mechanisms of the occurrence of accidents. In addition, JAMA recognized that the rate of helmets falling off has remained unchanged for 25 years at about 30% although the total number of fatal accidents in Japan has been continuously decreasing. Therefore, proper tightening of the chin straps of helmets and recommendation to wear a chest protector were added to the video.

Results Achieved

- Event exposure: Motorcycle shows and events
- Website/social media: Featured in various media and distributed on Internet news sites
- Certified driving schools: Broadcasting in waiting rooms in 46 locations
- Main expressway companies: Provided on the premise of broadcasting in service/parking areas of about 800 locations
- 150,000 QR cards: Distributed in private driving schools & safety events, seminars for high school students and study sessions for teaching staff in charge of traffic safety

Reproduction of major crashes

QR code to access video

MOTORCYCLISTS CONFEDERATION - CANADA

Introduction

Established in 1971, Moto Canada represents the interests of the world's leading manufacturers and distributors of motorcycles, scooters, and all-terrain vehicles in Canada representing over 2.2 million vehicles. Moto Canada has undertaken a broad variety of activities, including representing the interests of manufacturers and riders to the Government of Canada's Ministries of Transport, Environment and Climate Change and Border Services in addition to provincial ministries of transportation. Moto Canada is the largest producer of consumer motorcycle shows in Canada, where it promotes safety and the development of training schools and controlled consumer product trials for PTW and powered three-wheelers.

Summary of the Initiatives and Activities Developed

Among other activities, Moto Canada leads Canada's national public relations campaigns for Motorcycle Safety Month and Off-Road Safety Month in partnership with community organizations and enforcement agencies across the country.

Results Achieved

- Economic Impact of Riding in Canada

Moto Canada recently undertook research to establish a national economic impact study of on-road and off-road vehicle recreation in Canada. The Canadian powersports industry (excluding snowmobiles and personal watercraft) represents $17.3 billion in total economic output and $9.0 billion in total GDP. The study also found that there are over 88,000 people employed in the industry in Canada. The industry provides $3.2 billion in total government tax and fee revenue.

- Supporting Canada's Road Safety Strategy 2025

Moto Canada worked with the Canadian Council of Motor Transport Administrators (CCMTA) to have PTW riders included as vulnerable road users in the CCMTA's Road Safety Strategy (RSS) 2025 - Making Canada's roads the safest in the world, combined with Vision Zero. The strategy provides all stakeholders with an inventory of road safety initiatives which can be adopted or adapted to address specific road safety challenges.

For more on Moto Canada visit MotoCanada.com

MOTORCYCLE SAFETY FOUNDATION (MSF) - USA

Introduction

In 1972, representatives from several manufacturers established the Motorcycle Industry Council Safety and Education Foundation, Inc. (MICSEF), later renamed the Motorcycle Safety Foundation. MSF provides leadership to the PTW safety community through its expertise, tools, and partnerships.

Training courses available for different levels – from beginners to advanced, USA

Summary of the Initiatives and Activities Developed

By working with federal, state and local stakeholders such as safety officials, educational institutions, motorcycle clubs, the National Highway Traffic Safety Administration and others, MSF developed instructional materials and audio-visual aids establishing uniform safety strategies, operating practices, and skills testing. In 2014 MSF released an update to its Basic Rider Course that included an online learning segment, updated classroom training to address hazard perception and behaviour and updated, hands-on, range exercises to improve novice riders' skills, knowledge and judgement.

Results achieved

- Over 10 million motorcyclists have learned basic riding skills, knowledge, and judgement, or boosted their existing skills in MSF-developed courses during the first 50 years of the MSF's existence.
- Today, and for the past five decades, most of the state-wide motorcyclist training programs in states across the U.S., and all branches of the U.S. military, offer only the MSF RiderCourses[SM].
- In August 2011, MSF partnered with the Virginia Tech Transportation Institute to launch the world's first, large-scale, naturalistic PTW riding study, the MSF100. Findings from this study will inform both PTW and automotive training and education programs for years to come[41]. In 2019, the two organizations agreed to share valuable data from the study with autonomous vehicle developers. Sharing this data will help to ensure that motorcyclists are included in AV research programs and will help preserve on-highway motorcycling.
- In recent years, MSF has released specific courses for adventure and dual-sport motorcycles, as well as introductory experiences known as Ride Days for those interested in riding but have not taken any formal training.

[41] https://www.msf-usa.org/research.aspx#/home

- In 2024, the MSF worked to build national recognition of rider education, to increase visibility of motorcyclists, to reinforce safe riding practices, and to encourage new riders to start with proper training. Leveraging the organization's 50th anniversary, the team launched "50 Stories of Riding," sharing 50 personal motorcycling stories from MSF-certified coaches and former students for 50 weeks. Some stories also featured influential figures who were also MSF-graduates, such as actors, well known media figures and online influencers.
- MSF also organized RIDE Days across the nation, offering new riders their first experience with motorcycles and building awareness of the importance of formal rider education and training.
- To reach the general public, MSF used Public Service Announcements, syndicated stories, and targeted social media campaigns. MSF also sponsored a satellite media tour with a celebrity to spread safety messages during Motorcycle Safety Awareness Month, reaching an estimated 22.1 million viewers.
- MSF's website was updated, making it easier for prospective riders and coaches to find the information they need. Traffic to MSF's website soared by 134 percent, from 684,000 users in 2021 to 1.6 million in 2023, with page views growing from 1.7 million to 9 million.
- This all-encompassing campaign enabled the passage of legislation in both the U.S. House and Senate, recognizing May 2023 as Motorcycle Safety Awareness Month and honoring MSF for 50 years of service.

BALIK KAMPUNG ROAD SAFETY CAMPAIGN (BKRSC) - MALAYSIA

Introduction

Annually, a prominent automotive manufacturer in Malaysia joins forces with the Malaysia Motorcycle and Scooter Dealers Association (MMSDA) to spearhead the Balik Kampung Road Safety Campaign (BKRSC), marking its 25th year of committed Corporate Social Responsibility (CSR) efforts in raising awareness during the Hari Raya festive season.

Summary of the Initiative and Activities Developed

Throughout its evolution, the BKRSC team has traversed diverse locales, extending its reach to communities far and wide. However, in 2023, the campaign took a strategic turn, zeroing in on university students, acknowledging their considerable impact on accident statistics.

During the two-week campaign, a comprehensive array of safety measures was deployed, encompassing:

- Free motorcycle inspections.
- Helmet exchange initiatives.
- Safety riding training sessions.
- Interactive booths facilitated by esteemed co-sponsors and governmental bodies like the Road Transport Department (JPJ).
- Participation of 200 authorized dealers offering free inspections.

Results Achieved

Overall, the campaign has positively impacted over 8,000 customers. This extensive outreach was made possible through robust collaboration with business partners, authorized dealers and governmental agencies.

Participants must undergo the Free Bikes Inspection to qualify for the helmet exchange initiative.

GENERATION ROAD SAFETY – THE PHILIPPINES

Introduction

In 2021, during the global COVID pandemic, the Motorcycle Development Program Participants Association (MDPPA) introduced an online social media campaign to help create awareness about road safety named 'Generation Road Safety'.

Summary of the Initiative and Activities Developed

The activities were composed of virtual Road Safety Seminars for various types of road users, road safety talks with industry experts, photo and video Stories on riders' experiences and many unforgettable stories.

The main target groups of the campaign were children aged 5-8 years old, teenagers, senior high school students, motorcycle and scooter riders, and other road users.

Results Achieved

- Generation Road Safety Campaign Video
- 6 road safety talk episodes with the participation of industry experts
- 25 memorable and appealing video and photo stories from riders who shared stories about and their realization about the importance of road safety
- 200 road safety seminars for kids and teens
- A week after the launching it generates 2,700 MDPPA Facebook Page Likes / Followers.
- End of 2023, the MDPPA facebook page has 36,000 Likes & 38,000 Followers
- https://www.facebook.com/MDPPA.Official
- 53,600 online views and overall audience reach: 339,445

SECOND ROAD SAFETY SUMMIT – THE PHILIPPINES

Introduction

The Motorcycle Development Program Participants Association, Inc. (MDPPA) recently marked an incredible milestone with a grand celebration of its golden anniversary. This two-day event was a tribute to MDPPA's remarkable journey in shaping the Philippine motorcycle industry while advocating for responsible and safe motorcycling practices.

With the theme "MDPPA Rider's United: Riding Roads Responsibly for 50 Years," the event kicked off on October 6, 2023, at the Trinoma Activity Center in Quezon City.

The event served as a reminder of MDPPA's enduring commitment to road safety, innovation, and community building within the motorcycle industry. It was a moment to reflect on five decades of achievements and to look ahead to an even brighter future for motorcycling in the Philippines.

Meanwhile, a special Road Safety Summit was held at TESDA Women Center, Taguig last October 7, 2023.

Summary of the Initiative and Activities Developed

The occasion was graced by special guests from the Department of Transportation (DOTR), Land Transportation Office (LTO), Metro Manila Development Authority (MMDA), Philippine Red Cross, and University of the Philippines National Center for Transportation Studies (UPNCTS). Each shared their activities, plans, and programs that are designed for all road user's safety, especially riders. The summit featured discussions on the latest safety practices, programs, activities, riding experiences shared by riders, and strategies for making Philippine roads safer for everyone. A special Focus Group Discussion (FGD) about key issues on road safety was also conducted from the select members of the rider's group.

MDPPA Road Safety Committee also announced their upcoming search for the Best Riders group promoting Road Safety.

Results Achieved

This event brought together 50 Riders Groups/Clubs with more than 300 riders from the 50 club groups' top officials, fostering knowledge sharing and a deeper commitment to safety on the roads.

SEARCH FOR THE BEST DELIVERY RIDER – THE PHILIPPINES

Introduction

From March 2020 to March 2022, during the COVID pandemic, many restrictions were imposed, limiting individual mobility and collective mobility falling to 26% of pre-lockdown level. In this period, demand surged for delivery and ride hailing services, via on-demand platforms, whereby services were mostly provided by motorbike riders. MDPPA Search for the Best Delivery Rider of the Year 2022 was the 1st ever search in the country that honors the untiring dedication of our fellow Filipino riders who bravely face the COVID-19 pandemic by delivering our basic needs, day and night. This search will create a role model among delivery riders who exemplifies the value of road safety.

Summary of the Initiative and Activities Developed

As demand for motorcycle delivery services increased rapidly, the MDPPA – Road Safety Committee introduced a unique program recognizing the Motorcycle Delivery Riders. This new group of riders not only helped Filipinos make road travel safer and faster, they also assured that needs were met for those unable to move and economy to continue assuring continued trade and commerce.

Results Achieved

- More the 500 delivery riders from various delivery companies joined the search
- 24 Semi-Finalists were selected who underwent an online interview focusing on safety as its main focus/subject during the on-line discussion.
- 12 finalists were selected and went through the Theoretical examination which was composed of questionnaires focused on road safety (traffic laws, road signs, and road markings), then a Practical test which focused on safe driving through actual skills assessment and evaluation by the Honda Safety Driving Center instructor., and Mystery Customers Competition.

https://www.facebook.com/MDPPA.Official/videos/7251450254928997

"सुरक्षित सफर" (SURAKSHIT SAFAR – SAFE JOURNEY) – ROAD SAFETY INITIATIVE - INDIA

Introduction

Over the years, road safety stakeholders, including the government and SIAM, have implemented several initiatives to improve the road safety scenario in the country.
To ensure a more structured approach and to channel the initiatives in the area of Road Safety, SIAM Launched the "सुरक्षित सफर" (Surakshit Safar – Safe Journey) strategy in September 2022 under the aegis of the Hon'ble Chief Minister of Odisha State. The "Surakshit Safar" initiative focuses on initiatives to highlight the importance of the 4 E's of Road Safety, i.e., Engineering, Enforcement, Emergency Care, and Education.

SAFE Annual Convention 2022, India

Summary of the Initiative and Activities Developed

Surakshit Safar Pavilion @ Auto Expo – The Motor Show 2023 & @ Bharat Mobility Global Expo 2024:

The Surakshit Safar Pavilion, initially organized by SIAM during the Auto Expo – The Motor Show 2023, continued its impactful presence at the Bharat Mobility Global Expo 2024 under the theme "A Commitment for Safer Mobility." Held from 12th - 18th January 2023, the first pavilion at Auto Expo aimed to promote road safety among attendees, drawing a diverse crowd from various sectors such as students, vehicle users, manufacturers, emergency caregivers, and enforcers.

The pavilion featured informative panels on road safety, including topics like the significance of helmets and the Good Samaritan Law – First Responder. Additionally, it hosted competitions and distributed free helmets to visiting kids and youngsters. The success of this initiative led to its

second installment at the Bharat Mobility Global Expo 2024 from 1st to 3rd February 2024, emphasizing the 4Es of Road Safety: Education, Enforcement, Engineering, and Emergency Care. This edition included automated test tracks, simulators, street plays, competitions, and road safety awareness installations, engaging participants from key OEMs and stakeholders.

Notably, a "Run for Road Safety" involved over 1200 school children, fostering responsible road behavior and contributing to the overarching goal of creating a safer road environment.

Surakshit Safar Pavilion @ BMGE 2024

SIAM-KVS MoU:

SIAM introduced the “Road Safety Education & Awareness Programme”, tailored exclusively for school students across India. A Memorandum of Understanding (MoU) was formalized with the Kendriya Vidyalaya Sangathan to expand the reach of such initiatives.

This strategic partnership shall lay the groundwork for a large-scale educational campaign that aims to reach over 1.4 million students across 1,250 Kendriya Vidyalaya schools nationwide. SIAM has developed comprehensive road safety study materials tailored for different age groups and class levels.

These materials, a cornerstone of the "4E's of Road Safety," equip students with essential knowledge and skills for responsible road behaviour.

The awareness modules encompass topics like Basics of Road Safety, Pedestrian Safety, Safety Equipment, Road Signs and Traffic Signals, Legal Insights – Challans and driving Licenses, Safe Traveling to School, Roads & their Utilization, Distracted Driving and defensive Driving, and Shared Responsibilities – Good Samaritan.

High Security Registration Plates (HSRPs)

Ministry of Road Transport and Highways (MoRTH) have made HSRPs mandatory for all vehicles in India. HSRPs are registration plates electronically linked to their vehicles, which helps in accurate vehicle identification and effective traffic management. It facilitates monitoring traffic flow, identifying violators, and enf orcing traffic rules, contributing to overall road safety.

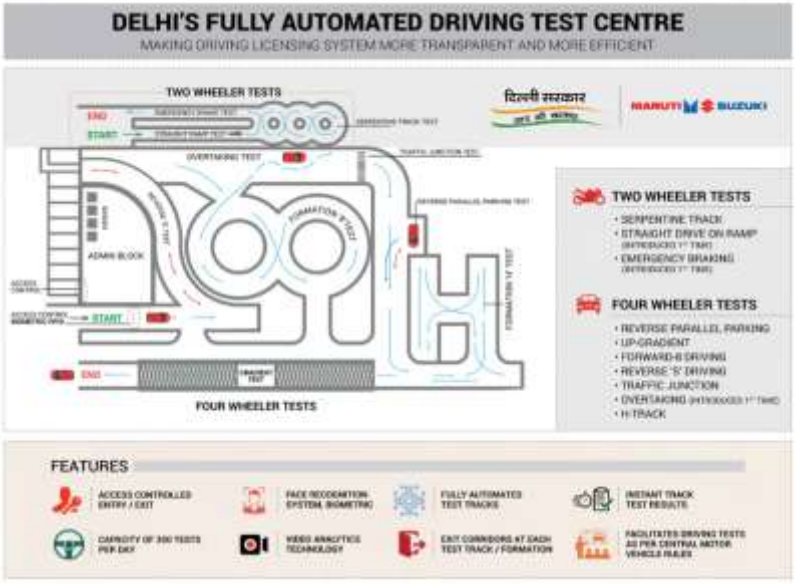
Two-Wheeler Rider training by SIAM Members

The industry has established free safety training for first-time riders by professional instructors, with courses tailored to the specific needs of target audiences. They are conducted with a high degree of interaction and participation and tackle all levels of literacy and understanding in all major Indian languages. SIAM members are voluntarily providing safe riding training to novice drivers. In the fiscal year 2023-2024, one of the leading two-wheeler companies provided theoretical training for 800,250 novice drivers and also offered training to over 700,000 customers using a two-wheeler simulator.

Figure 2

Automated Driving Test Centres

In India, the Ministry of Road Transport and Highways (MoRTH) has established automated driving test centres to ensure fair and accurate driving tests for license applicants. These centres use technology to assess driving skills objectively, reducing the scope for human error and biases. This is a significant step in ensuring safe driving o improve road safety standards in India. Automated Driving Test Tracks (ADTTs) utilize video analytics and sensor technologies to assess the driver's performance across a series of tests, including the "Reverse S" test, "8-formation" test, overtaking, stopping at a zebra crossing, parallel parking, and a gradient track test. These tests are designed to rigorously evaluate a driver's skills without any human intervention, except for monitoring by Motor Vehicle Inspectors (MVIs) through computer screens.



Automation in driving test center, Delhi

Initially, the introduction of automation in driving test centers led to a significant decrease in the pass rates, with success rates plummeting from highs of around 85% to as low as 34% at various centers. However, over time, there has been a notable improvement in pass rates at automated centers, with an increase from 34% to approximately 64% at the first four centers. This upward trend is credited to applicants seeking better training before taking the test, reflecting a shift towards more thorough preparation for safer driving. The eventual increase in pass rates after the introduction of automation suggests that applicants are adapting to the new requirements, contributing to the broader goal of ensuring that all drivers on the road have the necessary skills and training to drive safely.

Health Check-up Camp organized by SIAM Members

With its vision of ensuring the well-being of riders for road safety improvement, leading members of SIAM are partnering with NGOs and hospitals to provide regular Health Check-up camps with eye & ear care practices and additional services like blood pressure and sugar level tests. This helps improve the visual & hearing ability of riders, leading to reduced road accidents. In the fiscal year 2023-2024, one of the leading Indian vehicle manufacturers organized 2,449 numbers of eye check-up camps, which were attended by 1,29,469 individuals.

Driver Care Van, stationed at Auto Expo'23 & Bharat Mobility Global Expo 2024

HELMET SOCIETY PROJECT - THAILAND

Introduction

The industry initiated a large-scale national campaign to raise awareness of and to encourage the proper use of helmets, working with government agencies, civil organization and the private sector.

Summary of the initiative and activities developed

The 'Society Helmet Project' aimed to reduce the mortality rate of motorcycle accidents and improve responsibility of riders and passengers with regards to helmet wearing. The campaign involved national TV and radio, as well as online campaigns featuring popular personalities. The campaign distributed helmets in all levels of schools and universities, emphasizing the need for correct helmet wearing.

The project expanded wider in the school year by year from 2016 with full collaboration with the Office of the Basic Education Commission (OBEC), and the Ministry of Education in educating teachers in learning and organizing helmet-wearing activities with children nationwide.

Results achieved

- In 2019, participants involved 96,080 students, 1,326 teachers, and 663 schools from 77 provinces.
- The accumulation of students (2016-2022) involved in "Helmet School" is about 120,000 students
- In 2022, wearing helmets in participating school children had increased from 59% to 75% on average.

The Helmet School "Teacher can do" for promoting helmet-wearing and road safety in schools

ACCIDENT PREDICTION TRAINING (APT) – THAILAND

Introduction

Traffic accidents are often caused by negligence and the low situation awareness of the motorcycle riders. This may be due to lack of experience, lack of understanding and importance of traffic rules and complexity of the various situations that a rider may be confronted with on the road. Safety education and training will significantly increase risk awareness and help in reducing the incidence of crashes, saving human lives. The APT has been developed as animation for more attractive learning.

Summary of the Initiative and activities developed

Based on the local situation and using recent crash investigation studies conducted in Thailand from 2016-2020, key crash scenarios have been simulated and prioritized in a digital road-riding environment. The application enables the rider to experience (See, Evaluate, Execute) a wide variety of hazards and challenges which face motorcyclists every day, taken from real traffic and crash scenarios.

Developed in 2018, this website is open for everyone to learn at any time/anywhere on the website “hondasafetyapt.com”. The APT website has more than 70 cases for learning.

Results Achieved

- More than 200,000 users since 2018.
- The Accident Prediction Training (APT) has been included in the motorcycle licensing examination in Thailand since 2023.

Examples of the simulator and messaging to the trainee.

TRAINING ON ROAD TRAFFIC LAW AND SAFETY RIDING SKILLS - VIETNAM

Introduction

With 99.5 million inhabitants and 73.2 million motorcycles in circulation in Vietnam, powered two wheelers are the primary means of mobility. Year-on-year, training and safety education are provided by the motorcycle manufacturing industry.

Summary of the initiative and activities developed

A range of road traffic safety and motorcycle rider training courses have been developed and rolled out to meet the needs of children and adults, with the primary target group being the young people. The courses are periodically updated and improved following new insights encouraging road users to participate safely in traffic. Safety trainers provides classes at elementary schools, high schools, and colleges, delivering safety lectures and carrying out safety riding training to novice riders, advanced riders, professional users, and traffic police.

Industry also contributes to diverse government agencies and Traffic Police on traffic safety promotions to encourage road users respect traffic regulations.

Results achieved

In 2022, over 22,62 million people received a course. This increased by 30% compared with the previous year. Safety trainings have been provided to:

- 2,952,252 kindergarteners;
- 9,198,905 elementary children;
- 8,638,176 youth and students;
- 1,462,356 customers and residents;
- And 279 police officers.

From 2018 to 2022, the industry donated an accumulated 6.63 million helmets for pupils from 6 years old onwards. This continued effort helped raising helmet wearing awareness and increase the ratio of helmet wearing from 37% to 79%.

ANNEX 2: PICTURES

Pictures contributed by:

ABRACICLO (pages 5, 9, 16, 23, 62, 63, 64)

ACEM (pages ix, 10, 16, 23, 37, 40, 41, 42, 58, 60)

ARRB (pages 28, 31)

CMC (pages 44)

FAMI (pages 1, 5, 6, 26, 31, 34, 35, 38, 55, 61, 72)

IMMA (page 4)

IRTE (page 26)

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JAMA (cover and pages 11, 13, 15, 23, 43, 44, 65)

MASAAM (pages 31, 67)

MDPPA (page 70)

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SIAM (pages 5, 7, 16, 33, 36, 71)

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IMMA INTERNATIONAL MOTORCYCLE MANUFACTURERS' ASSOCIATION

International Motorcycle Manufacturers Association (IMMA)

Tel: + 41 22 920 21 23 • Fax: +41 22 920 21 21
20, Route de Pré-bois • CH-1215 Genève 15 • Switzerland

www.immamotorcycles.org