

# Road Safety Practices for Motorcycle Users

Toolkit

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# Preface

Road traffic injures remain a leading cause of death and disability globally with 1.3 million people killed and over 50 million people injured each year.

Nearly 30% of all road crash deaths involve powered two- and three-wheeled vehicles, such as motorcycles, mopeds, scooters and electrical bikes. In low- and middle-income countries, this figure is even higher, accounting for up to 60% of all road traffic deaths (WHO, 2022).

In many low-and middle-income countries, motorcycles are the main mean of transportation for families. Risk factors for motorcycle traffic injuries include users not wearing helmets, speeding, alcohol impairment, traffic conditions, roadside hazards, amongst others.

Evidence shows that correct helmet use can lead to a 42% reduction in the risk of fatal injuries and a 69% reduction in the risk of head injuries. Law enforcement and actions that improve the safety of motorcyclists are urgent and critical to save lives.

Based on country experiences and on practical initiatives, this **Toolkit titled "Road Safety Practices for Motorcycle Users**" contains case studies and good practices that aim to curb motorcyclists' deaths and injuries due to traffic crashes. It presents interventions related to road engineering and infrastructure improvement, helmet use, vehicle safety, enforcement, data collection and analysis, awareness and education.

It also includes some international experiences in promoting actions that lead to a reduction in road traffic injuries and deaths of motorcycle users.

Improving road safety requires consistent and concerted efforts including all road users. It is our hope that this toolkit is useful in providing examples of actions that can be adapted and replicated in different contexts.

Current situation of motorcyclists Road Safety worldwide

# Road Traffic Deaths Involving Motorcycles

Motorcyclists' road safety is an ongoing challenge worldwide, with millions of riders facing the risk of injury or death every year and the increase of motorcycles on the roads across the world.

Despite concerted efforts by governments, NGOs, and private sector, motorcycle crashes continue to occur at an alarming rate. Considering this context, the Second Decade of Action for Road Safety, which spans from 2021 to 2030, calls the attention to reduce the number of road traffic deaths and injuries globally.



According to the World Health Organization<sup>1</sup>, road traffic crashes kill approximately 1.3 million people every year and are the leading cause of death among young people aged 5-29 years. In 2018, 28% of all road traffic deaths involved powered two-and-three wheeled vehicles (PTWs), such as motorcycles, mopeds, scooters and electrical bikes (e-bikes). In low- and middle-income countries, this figure is even higher, accounting for up to 60% of all road traffic deaths. This is due to a combination of factors, the called risk factors, that contribute directly to the number of motorcyclists road traffic injuries and deaths include:

- Lack of protection, especially non-use of helmets
- > Road conditions and hazards
- > Design of road infrastructure

- > Speeding
- > Alcohol and substance impaired driving
- > Rider level of experience

- Mechanical problems and lack of vehicle maintenance
- Lack of appropriate post-crash response



#### Percentage of deaths among road user categories

1. WHO, 2022. Powered two-an-three wheeler safety: a road safety manual for decision-makers and practitioners.



Figure 2: Proportion of motorcyclists deaths by WHO region 2013-2016

# Top 10 countries with highest 2 and 3 wheelers vehicles / 100,000 hab<sup>2</sup>



Country	2 and 3 wheelers vehicles / 100,000 hab	
Thailand	23.04	
Dominican Republic	19.62	
Paraguay	11.62	
Indonesia	8.87	
Cambodia	8.58	
Colombia	7.80	
Sri Lanka	7.36	
Costa Rica	6.55	
Myanmar	6.01	
Uruguay	5.96	

#### Table 1\*: Top 10 countries with highest 2 and 3 wheelers vehicles / 100,000 hab

Alongside the scenario of road traffic injuries and deaths involving motorcycles, in recent years, there has been a notable increase in incidents, particularly in urban areas. Between 2013 and 2016, the number of two-wheelers in circulation on the world's roads increased by 10%<sup>3</sup>, especially in Southeast Asia, as the number of road traffic deaths involving this profile, as shown in the figure 2.

Country	Registered motorcycles / Country's population (%)		
Vietnam	50%		
Malaysia	41%		
Uruguay	36%		
Thailand	29%		
Greece	27%		
Slovakia	23%		
Sri Lanka	23%		
Lao People's Democratic Republic	21%		
Dominican Republic	20%		
The former Yugoslav Republic of Macedonia	18%		

#### Table 2\*: Top 10 countries with highest motorcycles fleet per population<sup>4</sup>

\*Note: The sample analysis considered countries with population higher than 100,000 habitants and with equal or higher than 100 road traffic deaths registered according to the WHO report (2018).

<sup>3.</sup> WHO, 2022. Powered two-an-three wheeler safety: a road safety manual for decision-makers and practitioners.

<sup>4.</sup> Global Status Report on Road Safety. World Health Organization, 2018.

Several factors contribute to this trend. One of the main reasons is the convenience and cost-effectiveness of using motorcycles as a mode of transportation. They are often cheaper to buy and maintain than cars in addition to their enhanced ability to maneuver through congested traffic conditions, reducing travel time. Additionally, with the rise of ride-sharing services and food delivery platforms, more people are using motorcycles for work-related purposes. Lastly, some people simply enjoy the freedom and thrill of riding a motorcycle and view it as a hobby or lifestyle choice.<sup>5</sup>

# Motorcycle Characterization

Motorcycles are two-wheeled motor vehicles that are designed for personal transportation. They typically have a gasoline-powered engine, and their smaller size and lightweight construction make them more agile, and more fuel-efficient than most four-wheeled vehicles. This type of vehicle usually requires a higher level of balance and stability while in motion or at rest compared to three-wheelers.

Part as the same category, there's also a three-wheeled vehicle, commonly known as a tricycle or trike, is a motorized or pedal-powered vehicle with one wheel in the front and two wheels in the back. It provides stability and maneuverability while riding. It's often used for recreational purposes, transportation, or specialized applications, three-wheeled vehicles offer a distinctive alternative to traditional two-wheeled or four-wheeled vehicles, being very popular in Southeast Asia.



The two-wheeler vehicle has become an integral part of modern society, with millions of people worldwide using them for transportation, recreation, and sport. For the purposes of this Toolkit, focus is placed on two-wheelers.

<sup>5.</sup> The factor listed represent a non-exhaustive reference of examples that contribute to the increase of 2 and 3 wheeled motorcycles worldwide.

Feature	Electric Bicycles	Two-Wheelers	Three-Wheelers
Number of Wheels	2	2	3
Stability	Moderate	Moderate	High
Power	Electric Motor	Motorized and Combustion	Motorized and Combustion
Balance Requirement	Required	Required	Not required
Steering	Handlebars	Handlebars	Handlebars
Braking	Hand/foot	Hand	Hand/foot
Seating Capacity	1	1-2	1-3
Weight	Light	Light to Heavy	Light to Heavy
Speed	Moderate	Moderate to High	Moderate to High
Road Legality	Street Legal	Street Legal	Street Legal
Emissions	Zero emissions	Low rate	Low rate
Purpose	Urban commuting, Recreation	Commuting, Recreation	Transportation, Cargo Hauling

Table 3: Comparative between electric bycicles, 2 wheels and 3 wheels vehicles

# Motorcycles and Legislation

Traffic legislation is crucial for promoting a safe and efficient movement of vehicles and pedestrians on roads and highways. It establishes rules and regulations that govern the behavior of the road users, with the objective of reducing crashes and injuries, minimizing congestion, and improving transportation efficiency. Traffic laws also provide a framework for enforcement, ensuring that those who violate rules and regulations are held accountable for their actions. By establishing clear expectations and consequences, traffic legislation helps to create a safer and more orderly transportation system for everyone.

When it comes to standards and legislation for motorcycles, it can vary depending on the country and region. Bellow, follow some general guidelines around the world:

### Licensing

A special licensing or endorsement to operate a motorcycle through training, and theory and practical tests is required.

In Germany, obtaining a motorcycle license is more expensive than a car, as well as the requirement to obtain a driver's license<sup>6</sup>. In Europe, the system for qualifying motorcyclists is done progressively, by means of steps, starting at 16. However, only at 24 years of age, motorcyclists can have direct access to category A, after 3 phases and at least two years of experience<sup>7</sup>.

<sup>6.</sup> https://bmdv.bund.de/SharedDocs/DE/Artikel/StV/Strassenverkehr/fahrerlaubnispruefung.html

<sup>7.</sup> https://road-safety.transport.ec.europa.eu/eu-road-safety-policy/priorities/driving-licence\_en

On the other hand, Cambodia and Laos are countries that can be listed as examples for not having mandatory licensing system as mandatory.

### Safety equipment

The use of helmets while riding a motorcycle is mandatory for the driver and for any other occupant. Other safety equipment such as gloves, boots, and protective clothing may also be required or recommended.



#### Applicability of national motorcycle helmet law to all occupants

Figure 6: Applicability of national motorcycle helmet law to all occupants <sup>8</sup>

Helmets standards can also be listed as a crucial requirement on motorcycles related legislation. Laws may vary from country to country depending on the age of the driver and vehicle power. Motorcyclists are required to wear helmets that comply with a safety standard that prescribe rigorous testing. Such standards aim to ensure that helmets available on the market protect the head adequately in a road traffic crash. UN Regulation No. 22 is the most widely respected and used regulation in the world, endorsed by more than 50 countries<sup>9</sup>.

### Vehicle standards

It defines regulations on the design and construction of motorcycles, including lighting, brakes, tires, and other components.

<sup>8.</sup> Applicability of national motorcycle helmet law to all occupants, WHO, 2023.

https://www.who.int/data/gho/indicator-metadata-registry/imr-details/219

<sup>9.</sup> https://unece.org/DAM/trans/publications/WP29/Leaflet\_Helmets.pdf

As of 2016, all new motorcycles in Europe, with engines with a displacement of more than 125 cc, will have to have ABS-type brakes, which prevent the wheels from locking up when braking hard. For models with engine sizes smaller than 125 cc, ABS or CBS will be mandatory, which "shares" the braking force between the wheels – the choice of one of them can be made by the manufacturer.

### Emissions

It establishes emissions standards that motorcycles must meet, which can vary depending on the engine size and type.

In the United States, the Environmental Protection Agency (EPA) Regulations sets emission standards for motorcycles through the Clean Air Act. The EPA regulates the amount of pollutants that can be emitted by motorcycles and mandates the use of emission control technologies such as catalytic converters.

#### Noise

Implementation of regulations on the amount of noise a motorcycle can produce. Countries such as Japan and Australia Australia have noise regulations for motorcycles set by government authorities. The regulations specify maximum noise levels and testing methods to ensure compliance.

### Circulation on highways and urban centers

It prohibit motorcycles to circulate in specified areas. China prohibits these vehicles on highways, leaving motorcyclists to use only back roads and dirt roads. The purpose of the measure is to prevent crashes and make the roads safer.

# The Motorcycles Market Trends

In recent years, there has been a significant surge in the number of motorcycles worldwide, reflecting a growing preference for this mode of transportation. According to the World Heal Organization report, in 2016 there were over 407 million 2 and 3 wheelers vehicles registered worldwide.

The economic impact forecast of the motorcycles market<sup>10</sup> will be significant:

- > Revenue in the Motorcycles market is projected to reach US\$128.90bn in 2023.
- Revenue is expected to show an annual growth rate (CAGR 2023-2027) of 6.94%, resulting in a projected market volume of US\$168.60bn by 2027.
- > The market's largest segment is On-road Motorcycles with a projected market volume of US\$90.38bn in 2023.
- From an international perspective it is shown that the most revenue will be generated in India (US\$25.650.00m in 2023).

<sup>10.</sup> Statista, 2023. https://www.statista.com/outlook/mmo/motorcycles/worldwide#revenue



Figure 7: U.S Motorcycles Market trends, 2019-2018.



Figure 8: Global Motorcycles Market.<sup>11</sup>

Another consequence of the COVID-19 pandemic was the accelerated adoption of delivery services, as more people rely on online shopping and food delivery to avoid crowded public spaces.

According to a report by Grand View Research<sup>12</sup>, the global motorcycle delivery services market size was valued at USD 4.2 billion in 2020 and is expected to grow at a compound annual growth rate (CAGR) of 9.4% from 2021 to 2028. The report notes that the growth is driven by factors such as increasing demand for fast and cost-effective last-mile delivery services, the rise of e-commerce, and the expansion of the food delivery industry.

<sup>11.</sup> Statista, 2023. https://www.statista.com/outlook/mmo/motorcycles/worldwide#revenue

<sup>12.</sup> Motorcycles Market Size, Share & Trends Analysis Report By Type (On-road Motorcycles, Off-road Motorcycles, Scooters), By Region, And Segment Forecasts, 2022 – 2028.

With the significant increase in the global prevalence of motorcycles in recent years, it is imperative to intensify our efforts to prioritize road safety for this particular demographic. As a mode of transport that offers affordability, fuel efficiency, and ease of maneuverability in congested urban areas, the benefits are promising. However, this rise in motorcycle usage also presents a pressing concern for road safety. To mitigate the associated risks, it is crucial to implement comprehensive measures that encompass improved infrastructure, stricter regulations, comprehensive rider training programs, and enhanced awareness campaigns to promote responsible motorcycle riding. By addressing these key areas, we can ensure the safe coexistence of motorcycles and other road users while encouraging the continued growth of this mode of transportation.

# The Motorcyclists' Critical Profile

To better address the needs and solutions for the motorcyclist road safety, it is essential to map through a comprehensive analysis and evaluation factors that influence the safety of motorcyclists.

Among the main motorcycle's user, it's possible to classify them in three main profiles by type of use:



- > Use of motorcycles for work: These individuals may include delivery drivers, courier services, and mobile services providers. They typically use motorcycles as a means of transportation or to carry out their duties. This group is characterized by:
  - The frequent use of the motorcycle;
  - Have specialized equipment or modifications on their motorcycles to help them perform their job duties;
  - Prioritizing speed and efficiency when riding, and may be more likely to take risks on the road to meet tight deadlines;
  - Having specialized training to improve their riding skills and ensure they are prepared for any challenges they may encounter on the job.



- > Use of motorcycles for transportation: These individuals may use motorcycles as a primary or secondary mode of transportation to get to and from work or school, or for running errands. This group is characterized by:
  - Using the vehicle on a regular basis, but not necessarily every day;
  - Prioritizing safety and practicality when choosing a motorcycle, and opting for models with more comfortable seats or storage compartments;
  - Riding more cautiously and defensively;
  - The convenience and cost-effectiveness of using a motorcycle for transportation.



- > Use of motorcycles for leisure: These individuals may ride motorcycles purely for enjoyment, such as taking scenic routes, participating in group rides, or attending events or rallies. This group is characterized by:
  - Less frequent use, but with more time on the road during each ride;
  - Aesthetics and performance as a priority, investing in customization or upgrades;
  - Aiming fun and adventure when riding, and may be more likely to take risks on the road;
  - Participation in clubs or groups with other enthusiasts.

# **Risk Factors**

To address solutions regarding road safety to and for motorcyclists, it is necessary to map the main risk factors that are responsible for the occurrence of crashes and deaths in traffic. The most common factors, according to literature and programs conducted are:

Lack of Protective Equipment: Not wearing proper protective equipment such as helmets, gloves, jackets, and boots can increase the severity of injuries in the event of a crash.

For motorcyclists, it's essential to reinforce the safety equipment necessary.





Figure 9: The difference of using a full equipment that using none

Helmets can reduce the risk of head injuries by up to 70%<sup>13</sup>, while gloves, jackets, and boots can protect against abrasions and road rash. Moreover, wearing protective gear can also make riders more visible to other motorists, further reducing the risk of crashes.

Head injuries are the leading cause of death in most motorcycle crashes internationally. Studies conducted on the types of helmets show that a full-face helmet is more effective in preventing head and cervical injuries than half-coverage or open-face helmets<sup>14</sup>.



Retention system

therefore offers no protection.

<sup>13.</sup> HELMETS. A road safety manual for decision-makers and practitioners. Second edition. WHO, 2023.

<sup>14.</sup> Chaichan S, Asawalertsaeng T, Veerapongtongchai P, Chattakul P, Khamsai S, Pongkulkiat P et al. Are full-face helmets the most effective in preventing head and neck injury in motorcycle crhass? A 11. HELMETS. A road safety manual for decision-makers and practitioners. Second edition. WHO, 2023.

<sup>15.</sup> Page PS, Wei Z, Brooks NP. Motorcycle helmets and cervical spine injuries: a 5-year experience at a Level 1 trauma center. J Neurosurg Spine. 2018.

<sup>16.</sup> Høye A. Bicycle helmets – to wear or not to wear? A meta-analyses of the effects of bicycle helmets on injuries. Accid Anal Prev. 2018.



**Speeding**: Monitoring speed is a critical aspect of safe motorcycling. Riding at excessive speeds can increase the risk of crashes and injuries, and even deaths. Speeding also affects a rider's ability to judge stopping distances accurately, making it more likely for them to collide with other vehicles or objects. Moreover, high-speed crashes are more likely to result in severe injuries or deaths.

To ensure safe riding, it's crucial for motorcyclists to monitor their speed and adhere to the posted speed limit. They should also adjust their speed based on the road conditions, weather, and visibility.

The safe speed for motorcycles depends on various factors, such as road conditions, weather, and traffic. According to the Motorcycle Safety Foundation (MSF), recommends that riders keep up with the traffic flow, but not exceed the speed limit. It suggests that riders should not exceed the posted speed limit by more than 10-15 mph<sup>17</sup>. However, even if riders are traveling at or below the speed limit, they should always be aware of their surroundings and be prepared to slow down or stop quickly if necessary.

Alcohol and Drug Use: For motorcyclists, consuming alcohol and drugs is a risky and dangerous decision that can have severe consequences. Alcohol and drugs impair judgment, reflexes, and coordination, all of which are essential skills required to operate a motorcycle safely.

According to the National Highway Traffic Safety Administration (NHTSA), alcohol and drug use among motorcyclists is a significant problem. In 2021, 29% of motorcycle riders involved in fatal crashes had a blood alcohol concentration (BAC) over the legal limit of 0.08%<sup>18</sup>. Additionally, NHTSA data shows that in 2018, 22% of motorcycle riders killed in crashes had tested positive for drugs. This underscores the importance of never riding under the influence of alcohol or drugs, and highlights the need for increased awareness and education around this issue.

<sup>17.</sup> You and your scooter – Rinding Types. Motorcycle Safety Foundation, 2020. <u>https://msf-usa.org/wp-content/uploads/2023/02/</u> Sccoter-Riding-Safety-Tips-Booklet.pdf

<sup>18.</sup> Buzzed Driving is Drunk Driving Campaign. NHTSA, 2021. <u>https://www.nhtsa.gov/risky-driving/drunk-driving#motorcyclists-5071</u>

**Inexperienced Riders:** Novice riders are more likely to be involved in crashes due to their lack of experience and inability to handle unexpected situations on the road. According to data from the National Highway Traffic Safety Administration (NHTSA), in 2019, 28% of motorcycle riders involved in fatal crashes had no valid motorcycle license at the time of the crash<sup>19</sup>. In addition, 33% of riders involved in fatal crashes who did have a valid motorcycle license had less than a year of riding experience.

The NHTSA also reports that in 2019, riders aged 40 and over accounted for the majority (54%) of motorcyclist deaths, while riders aged 29 or younger represented 33% of deaths. This suggests that experience alone may not necessarily prevent crashes, as even experienced riders can be involved in crashes. However, experience can certainly help in avoiding risky behavior and recognizing potential hazards on the road.

**Poor Road Conditions:** Poor road conditions can cause a motorcycle to lose traction, leading to crashes, particularly for motorcyclists, who are more vulnerable than other motorists. It includes lack of proper road markings and signs, inadequate lighting, potholes, uneven pavement, and poor drainage. Also, it can be particularly challenging for motorcyclists during adverse weather conditions, such as rain or snow.

Lack of Maintenance: Regular maintenance is crucial for safe and reliable operation of motorcycles. Neglecting maintenance tasks like oil changes, tire checks, and brake inspections can lead to mechanical failures, decreased fuel efficiency, and compromised safety.

Following the manufacturer's recommended maintenance schedule and seeking professional help is important to detect potential problems early and avoid costly repairs. Well-maintained motorcycles can also retain their value and provide a better resale value. In summary, periodic maintenance is essential for responsible motorcycling, preventing breakdowns, extending the life of motorcycles, and ensuring their optimal performance.

# Items that need maintenance



Figure 12: Items that need maintenance.

<sup>19.</sup> Motorcyclist Safety. NHTSA, 2018. https://www.nhtsa.gov/book/countermeasures/countermeasures-work/motorcycle-safety\_

SỬ TÀI NGUYÊN VÀ MỘI TRUỆ. Thẩm Phố hỗ chỉ minh Tring tân quan trắc Tài nguyên và nội trưởng Thông tin chất lượng Mội trưởng Thủ dang trưởng

# Road Safety Interventions

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The implementation of road safety interventions is not just about reducing road traffic crashes, but also to prevents injuries, deaths, costs, and reduce the demand for health services.

When it comes to motorcyclists, the relevance of an integrated and structured approach is crucial to motorcyclists' safety. As an example, in the United States, motorcyclists are about 28 times more likely than passenger car occupants to die in a motor vehicle crash per vehicle mile traveled. In 2019, the deaths rate of motorcyclists involved in a crash with another vehicle was 59%, while the deaths rate for occupants of cars involved in a crash with motorcycles was 8%<sup>20</sup>.

According to the Global Plan of the Decade of Action for Road Safety<sup>21</sup>, experience suggests that an adequately funded lead agency and a national plan or strategy with measurable targets are crucial components of a sustainable response to road safety and to improve the motorcyclist's safety on the roads.

The Global Plan reinforces three key components that are needed to sustain an integrated safety system approach.



Figure 13: Global Plan – Decade of Action for Road Safety 2021-2030.

# **Roles and Responsibilities**

Providing safer roads conditions for road users is a shared responsibility amongst governmental agencies, private sector, society, NGOs, academia and non-state-actors, each one contributing in essential ways.

<sup>20.</sup> National Highway Traffic Safety Administration (NHTSA), 2021.

<sup>21.</sup> Global Plan of the Decade of Action for Road Safety 2021-2030



Figure 14: Motorcyclists Road Safety agents <sup>22</sup>

**Government Departments and Traffic Authorities:** Responsible for ensuring citizens' safety by prioritizing and allocating funding for road-safety initiatives according to an action plan. Also, to implement and review road traffic legislation standards, guaranteeing its compliance.

Role of academia, civil society and youth: Generate and gather evidence to support the government decision making by providing structured analysis on the problem and identifying strategies and solutions. As to the civil society, it is their responsibility to implement the policies measures and consciously use the roads as any road user.

**Private Sector and Fleet Managers**: Essential role on prioritizing road safety related SDGs by applying Safe System through all the value chains and reporting on safety performance. Also, for companies that work with internal fleets, establish, and supervise safety standards, provide the safety gear and vehicles maintenance.

**Funders**: Being public or private sector, funders ensure financial investment to support road safety improvements and/or specific initiatives, providing agility on the implementation of activities.

**United Nations**: Facilitates collaboration with UN agencies and support Member States by raising awareness, establishing targets, providing policy guidance, technical references and engaging with different stakeholders.

**Motorcyclists**: Carry out the trainings required for the use of motorcyclists and the roads, drive consciously and in compliance with traffic laws, such as the mandatory use safety equipment.

<sup>22.</sup> Global Plan for the Decade of Action for Road Safety 2021-2030

# Road Safety Interventions for Motorcyclists

## Management Methodology applicable to Road Safety

Internationally known and comprehensively used, the PDCA (plan–do–check–act) method is a simple method focused on results and very efficient in business for the control and continuous improvement of processes and products. Figure 2 shows and exemplifies the steps to be followed by the methodology.





This methodology and how to implement it, along with country case studies can be accessed in the "Management Practices for Safer Roads Toolkit<sup>23</sup>."

The Toolkit presents general orientations on how to implement a Road Safety Programme and it can be applied also to design interventions that contribute to motorcyclists safety.

# Various Road Safety Interventions

Road safety interventions are critical measures designed to improve the safety of all road users and reduce the number of deaths and injuries resulting from road crashes. There are various interventions that can be implemented to improve road safety, that can be classified according to the following key pillars:



Figure 16: Road safety interventions pillar

<sup>23.</sup> https://unitar.org/sustainable-development-goals/people/our-portfolio/road-safety-initiative/management-practices-safer-roadsonline-toolkit

Initiatives connected with technology will present a stamp represented by this symbol:



# **Data Management**

This type of intervention entails the collection and analysis of road traffic crash data, with a view to identifying patterns, hotspots, and high-risk areas for motorcyclists. This information can then inform the development of targeted interventions aimed at reducing the incidence of crashes.

In situations where structured data collection is lacking, it may be possible to collaborate with local government to establish a data flow and dashboard for the monitoring of results.



#### Figure 17: Road Safety Dashboard example

In Brazil, the Ministry of Infrastructure has developed the National Registry of Traffic Crashes and Statistics (RENAEST), which consolidates information on road crashes in 18 states. This valuable resource is instrumental in informing the development of public policies aimed at reducing the incidence of crashes on streets and roads throughout the country. In addition, the project is currently implementing a predictive model that utilizes data analysis to map future trends and events related to road traffic crashes and deaths.

Other initiatives focused on data collection represent great advances on supporting the decision-making process based on facts and analyzed information.

UNITAR, together with the Andean Community launched the "Road Safety Virtual Dashboard<sup>24</sup>", becoming a source of road traffic data for Bolivia, Colombia, Ecuador and Peru.



Figure 18: Tablero Virtual, Andean Community

There are examples from the private sector that seek to leverage road safety knowledge and new technologies to reduce road traffic crashes. The ABI Foundation is also launching a technology based on the P-D-C-A methodology, with a focus on phenomenon analysis. It is based on a technology developed to analyze data and generate, through georeferencing, heat maps and a victim profile dashboard for governments, road traffic authorities and fleet managers to use.

The use of technology and development of a victim profile dashboard will help improve road safety and scale up road safety interventions and improve the decision making process.



Figure 19: Data management portal, ABI Foundation

<sup>24.</sup> https://comunidadandina-seguridadvial.netlify.app/#/

### Awareness and Education

Educational and awareness interventions for motorcyclist safety have the primary goal of disseminating information to individuals and communities regarding safe behaviors. These interventions are intended to encourage the adoption of safe practices that can reduce the risk of crashes and injuries. The approach taken may vary depending on the target audience, with interventions tailored to specific profiles.

The interventions can take different forms, such as:

- > Public awareness campaigns that use various media channels,
- > School-based programs that teach age-appropriate road safety lessons,
- Community-based workshops, and seminars.

#### **Educational Programs for Motorcyclists Licensing**

An educational program for motorcyclists training and licensing can contemplate two pillars:

# > Risk management Theorical Education

- > Traffic Laws and regulations
- > Motorcycles control and operation
- > First-aid training
- > Awareness and hazard perception

### Skills and Experience **Building**

- > Basic and safe maneuvers
- > Riding in traffic practice

#### > Riding in different conditions

> Emergency techiniques

Knowledge tests and riding evaluations are crucial for assessing riders' understanding of traffic laws and their ability to operate a motorcycle safely and efficiently. It is imperative to advocate for the renewal of licensing requirements as it encourages the regular review of content and promotes safe practices, thereby reinforcing the significance and severity of enforcement measures.



#### **Helmet Awareness Campaigns**

Helmet Awareness Campaigns play a vital role in promoting safety on the roads. By highlighting the importance of wearing helmets, these campaigns raise awareness among the public. They educate individuals about the potential risks of head injuries and encourage responsible behavior. Through powerful messages and outreach initiatives, helmet awareness campaigns strive to create a culture where wearing helmets becomes a norm, safeguarding lives and preventing crashes.

Figure 20: Help Save Lives With Heads Up! Helmet Safety Campaign, Vietnam<sup>25</sup>

#### **Public Awareness Campaigns - Community Outreach**

Public campaigns can be directed towards the community to raise awareness among all road users about the challenges faced by motorcyclists on the road, as well as emphasize the imperative of prioritizing their safety while navigating the streets.

This kind of campaign can also be replicated for truck fleet managers and drivers. Truck drivers play a crucial role in ensuring road safety, not only for other motorists but also for vulnerable road users such as motorcyclists. Given the significant size and weight of trucks, it is essential for truck drivers to exercise responsibility and awareness when sharing the road with motorcyclists.



Figure 21: Share the Road, Texas Department of Transportation Campaign <sup>26</sup>

<sup>25.</sup> Help Save Lives With Heads Up! Helmet Safety Campaign, Vietnam, 2019. <u>https://en.prnasia.com/releases/apac/help-save-lives-with-heads-up-helmet-safety-campaign-366758.shtml</u>

<sup>26.</sup> Share the Road – Look Twice for Motorcycles. Texas Department of Transportation Campaign, 2020. <u>https://www.newswest9.</u> <u>com/article/traffic/texas-department-of-transportation-launches-share-the-road-look-twice-for-motorcycles/513-2196508a-1424-4dcd-b990-b7b67f9fdf3f</u>



- Be always aware of their surroundings, including constantly checking blind spots and mirrors for any nearby motorcycles. Regularly scanning the road and being mindful of motorcycles can help prevent potential collisions.
- Maintain a safe following distance once motorcycles have a shorter stopping distance and are more maneuverable compared to trucks.
- Exercise caution when making turns or changing lanes. It is vital to use turn signals well in advance and give motorcycles enough time and space to react. Sudden lane changes or turns can startle motorcyclists and potentially lead to crashes. By signaling their intentions early and being patient, truck drivers can greatly enhance motorcycle safety on the road.
- > Avoid distractions, such as mobile phones or any other activity that may divert attention from the road.
- > Adjust their driving behavior in adverse weather conditions. Rain, strong winds, or icy roads can pose significant challenges for motorcyclists. Slowing down, maintaining a safe distance, and using appropriate signals become even more critical during adverse weather.

#### **Rider Training Programmes for Safety Equipment Use for Motorcyclists**

Rider Training Programmmes emphasize safety equipment for motorcyclists. These comprehensive courses educate riders on proper usage and importance of protective gear. From helmets to gloves, riders learn how safety equipment mitigates risks and safeguards lives. Instructors highlight the significance of quality gear, fit, and regular maintenance.

Through practical demonstrations and theoretical modules, participants gain insights into helmet safety standards, armor functionality, and visibility aids. These programs also emphasize safe riding practices and emergency procedures. By instilling a culture of safety, riders emerge equipped with knowledge and skills to protect themselves on the road, ensuring a thrilling yet secure motorcycling experience.



Figure 22: Practical Guide for the Conscient Motorcyclist <sup>27</sup>

#### Technology applied to Awareness and Education

The "We Are the Traffic"<sup>28</sup> initiative represents an impactful and educational campaign launched in Brazil, encompassing a compelling 12-episode series that focuses on the realm of motorcyclists. This carefully designed initiative aims to raise awareness among individuals by shedding light on the significant contribution of motorcyclists to claims records in every state of the country. "The project will use a simple and didactic language, allowing people to understand traffic no longer as an isolated fact, but as an integral part of this system, where each one will be able to see their own faults, roles, acts and attitudes.

The online series will be shown and distributed through an online platform, which will use all social networks to connect and respond to cases with the population.



#### Figure 23: We are the traffic initiative

25. Practical Guide for the Conscient Motorcyclist, Brasilia Vida Segura Program, Brasilia, 2019.

28. We are the traffic project. Brazil, 2018. <u>https://alagoasalerta.com.br/noticias/alagoas/alagoas-vai-exportar-modelo-inovador-de-educacao-no-transito</u>

#### **Emergency Response**

In case of a traffic crash, emergency services are responsible for managing the crash location and provide the necessary first aid procedure to the victim. Different public services can be reached for help:



To ensure that the emergency service is carried out correctly, it is essential:

- > To prevent other crashes from happening, it is important to assure that the crash location is properly signposted. It is also important having someone to redirect the traffic. These measures will guarantee security for the emergency team and for the victim.
- > Emergency vehicles must be properly prepared for emergencies.
- > The integration of emergency services is a very important factor in ensuring that all casualties are treated quickly and correctly. Emergency services must communicate to better manage rescues.

According to the WHO, less than 8 minutes correspond to the perfect reaction time<sup>29</sup>.

"Each minute decreases that person's chance of survival by almost 10%. Why is this quick service important? It's the difference between a person surviving or dying" - Gerson Salvador, director of the São Paulo doctors' union and an infectologist.

Emergency response can be analyzed in two different perspectives:

- 1. Motorcycle EMS Units and motorcycles paramedics;
- 2. Medical care to motorcyclists as road traffic crashes victims

<sup>29.</sup> Response time in the emergency services Systematic review. 2018.



#### Motorcycle EMS Units and motorcycles paramedics

Motorcycle EMS units offers several benefits in emergency response situations, particularly in urban areas or congested traffic. It can provide faster response, enhance the access to locations that cannot be reached by larger vehicles, aid even with congested traffic providing patients outcomes. Emergency response initiatives for motorcycles typically focus on improving the efficiency and effectiveness of emergency medical services (EMS) provided by motorcycle units. These initiatives aim to enhance the ability of motorcycle paramedics or emergency medical technicians (EMTs) to reach and provide timely medical assistance at the scene of an emergency:

- Motorcycle EMS Units: Establishing dedicated motorcycle EMS units within existing emergency medical services. These units consist of specially trained paramedics or EMTs who are equipped with medical supplies and communication devices to respond quickly to emergencies in high-traffic or congested areas. Motorcycles allow them to navigate through traffic more efficiently than traditional ambulances.
- Rapid Response Units: Deploying motorcycle-based rapid response units that can reach the scene of an emergency quickly. These units are equipped with essential medical equipment such as automated external defibrillators (AEDs), oxygen supplies, trauma kits, and other necessary tools. They can provide immediate medical interventions until an ambulance or additional resources arrive.
- Community Awareness Programmes to educate the community about the presence and capabilities of motorcycle-based EMS units;
- Education and Training Programmes pro motorcycle paramedics, focused on techniques, safety protocols, emergency medical procedures, and effective communication.

#### Motorcyclists as road traffic crashes victims

In case of a traffic crash, emergency services are responsible for managing the crash location and provide the necessary first aid procedure to the victim. Different public services can be reached for help:

When facing a traffic crash situation, there are important measures to be taken.

#### 1. Mark the place of the crash:

Signaling the crash location is extremely important to prevent other crashes from happening

#### 2. Check for victims:

It is important to understand if there are victims involved, to provide this information to the rescuers and provide first aid, if necessary.

#### 3. Request the ransom:

When calling the emergency number, the following information must be given:

- What happened;
- Where the victim is located;
- Whether or not the victim is conscious;
- If the victim breathes;
- If the victim has any object on the body;
- If the victim has any bleeding;
- If the victim is trapped somewhere.

# Intelligent Emergency Call – Ecall<sup>30</sup>



Various uses of the ECALL system in cars have shown that emergency services reach the scene of crashes 40 to 50% faster with the help of this safety system.



Figure 24: ECALL system for motorcycles



### Enforcement

This entails the implementation and enforcement of traffic laws and regulations, encompassing measures such as speed limits, seat belt and helmet laws, as well as impaired driving laws. The achievement of these objectives can be realized through the deployment of police patrols, utilization of traffic cameras, and imposition of fines or penalties for infractions committed against traffic regulations.

#### > Police patrols

Police patrols refer to the activities carried out by law enforcement agencies to maintain public safety and enforce the law. Patrol officers, whether on foot, in cars, or on motorcycles, play a crucial role in maintaining law and order in their respective jurisdictions.

#### > Delivery apps and regulations

Regulations for motorcyclists delivering through delivery apps may vary by country or region. However, here are some common regulations that may apply:

- Licensing: Motorcyclists may be required to possess a valid driver's license and any additional licenses or permits specific to operating a motorcycle for commercial purposes. Some companies run a practical test with the candidates.
- Insurance: Delivery riders may need to have appropriate insurance coverage for their motorcycle, including commercial or third-party liability insurance.
- Safety Equipment: Regulations may mandate the use of safety equipment such as helmets, reflective vests, or other visible attire to enhance rider safety and visibility. The equipment can even be provided by the company.
- Vehicle Requirements: Delivery motorcycles may need to meet certain specifications, such as being roadworthy, properly maintained, and compliant with emissions standards.
- Speed Limits: Riders are typically expected to adhere to designated speed limits and traffic regulations to ensure road safety.

- Traffic Violations: Motorcyclists should obey traffic laws, including rules regarding lane usage, signaling, and stopping at traffic lights and stop signs.
- Working Hours: Some jurisdictions might have restrictions on the working hours of delivery riders to prevent fatigue-related crashes. This could include limitations on the number of consecutive hours worked or mandatory rest periods.
- **Training**: In some areas, delivery riders may be required to undergo training programs or courses that focus on road safety, defensive driving techniques, and efficient delivery practices.

It's important for motorcyclists working for delivery apps to familiarize themselves with the specific regulations and requirements in their respective locations, as they can vary significantly. Local transportation authorities or the delivery app companies themselves can provide more detailed information on the regulations that apply to delivery riders.

# > Speed Radar<sup>31</sup>



It accurately detects infraction. Linked to high-definition monitoring cameras, the speed meters are equipped with software that manages to emit data such as the attempt of motorcyclists to dodge the radar on the sidewalk, stopping at crosswalks, traffic lights on red, among others. The technology, called inductive loop, allows you to record and capture the image of the vehicle and motorcycle anywhere on the road.

In Curitiba, Brazil, 200 new speed control radars were installed. The measure resulted in a 48% reduction in the number of crashes with victims. Data from BPTRAN shows that in 2019, the number of crashes with victims was 4.278, between January to August. In 2022, at the same period, the number of crashes with victims decreased to 2.089.



Figure 25: Speed Control Radars

<sup>31.</sup> https://www.uol.com.br/carros/noticias/redacao/2022/10/13/novo-radar-inteligente-promete-por-fim-as-atrocidades-demotos-no-transito.htm



Figure 26: Bufferzones implemented in Brasilia, Brazil

### Infrastructure improvements

This involves upgrading the road network, improving traffic flow, and enhancing the safety of the road environment. Examples include constructing or repairing roads, installing traffic signals and signage, and improving lighting and visibility.

#### > Bufferzones

Buffer zones are designated areas on the road that provide additional space between motorcyclists and other vehicles. These zones can be created by marking a specific area solely for motorcyclists, typically located between lanes or at the sides of the road. Buffer zones aim to reduce the risk of collisions by increasing the visibility of motorcyclists and giving them a dedicated space.



Between 2013 and 2015, around 350 buffer zones were implemented in the city of São Paulo. 54 crossings were monitored, generating the following results:

- > 28% decrease in the pedestrians hit by motorcyclists;
- > 17% decrease in the total of injuries;
- 25% decrease in the number of crashes involving motorcyclists.

Intervention recommendations:

- Implement buffer zones with zebra crossings.
- Applicable on traffic signs with traffic lights.
- Intervention orientation and educational efforts to guarantee the understanding.
- Implement vertical signs so it can be seen from the distance.

#### > Barriers and crash cushions

Barriers and crash cushions are physical structures placed along roadsides or medians to prevent motorcyclists from colliding with fixed objects or entering hazardous areas. These barriers are designed to absorb impact forces and redirect vehicles away from potential hazards, reducing the severity of collisions and providing protection to motorcyclists in case of a crash.

#### > Road markings and signage

Clear and visible road markings and signage are essential for motorcyclist safety. Motorcycles may be more vulnerable to road hazards due to their smaller size, so well-maintained and properly placed road markings, such as lane lines, symbols, and directional arrows, help motorcyclists navigate safely. Additionally, signage specifically designed to alert motorists about the presence of motorcyclists can enhance their visibility and increase overall road safety.

#### > Traffic calming measures

Traffic calming measures, such as speed bumps, speed humps, chicanes, and roundabouts, are implemented to reduce vehicle speeds and create a safer environment for all road users, including motorcyclists. These measures discourage excessive speeding and encourage drivers to be more cautious, reducing the likelihood of crashes and minimizing the severity of injuries in case of a collision involving motorcyclists.



#### > Road surface conditions improvement

Poor road surface conditions can pose significant risks to motorcyclists. Uneven pavement, potholes, loose gravel, or slippery surfaces can lead to loss of control and crashes. Regular maintenance and repair of road surfaces, along with the use of materials that provide better grip, can greatly enhance the safety of motorcyclists by minimizing the chances of skidding or losing traction.

#### > Blue Lane

A blue lane, also known as a motorcycle lane, is a designated lane exclusively reserved for motorcyclists. These lanes are usually marked with blue paint or have distinct signage to differentiate them from regular lanes. Blue lanes provide a dedicated space for motorcyclists, allowing them to travel more safely and efficiently, separate from other vehicles. These lanes may be implemented in congested areas or along frequently traveled routes to promote motorcycle safety and encourage their use as a sustainable mode of transport.

Recommendations:

- Analyze hot spots, and implement blue lanes in regions with a high number of motorcyclists;
- Implement orientation signs to alert motorcyclists, pedestrians, drivers and cyclists about the blue lane;
- It is important to analyze the blue lane involving other traffic variables, such as traffic light crossings, pedestrian crossings, cyclists, trucks, to evaluate the results over time in terms of fluidity and safety.

Pros and Cons when implementing blue lanes:



#### **Positive:**

**Reduce traffic congestion:** exclusive lane for motorcyclists can reduce the congestion between the vehicles. In Brazil, there was a 15% reduction, showing that the new space brought organization to the vehicular flow.

Enhance safety for motorcyclists: the initiative can reduce the number of accidents between cars and motorcycles.

Low investment in infrastructure: the blue lane only organizes the space already used for motorcyclists.



#### **Negative:**

**Enforcement challenges:** It can be challenging to enforce the use of motorcycle lane and prevent cars from entering them.

**Space limitation:** In some cities, there may not be enough space to build blue lanes, which could limit their effectiveness.



Figure 28: Motorcycle exclusive lane in Maline, Philippines



Figure 29: Motorcycle exclusive lane in Jakarta, Indonesia

# Vehicle Safety Improvements

This involves improving the safety features of vehicles to protect occupants in the event of a crash. Examples include seat belts, airbags, anti-lock brakes, and electronic stability control.

#### > Motorcycle Inspection

Motorcycle inspections are the process of assessing the condition and compliance of motorcycles with applicable laws and regulations. Inspections can be carried out by authorized personnel, such as law enforcement officers or certified mechanics, to ensure that motorcycles meet safety standards, have valid registrations, and comply with other relevant requirements. Inspections typically involve checking components such as lights, brakes, tires, exhaust systems, and signals to ensure they are in proper working order.

- **Visual inspection:** Check for damage, wear, leaks, and overall condition.
- Fluid levels: Inspect and maintain proper levels of oil, coolant, and brake fluid.
- Brakes: Test responsiveness, inspect brake pads, and check for leaks.
- Electrical system: Verify the functioning of lights, signals, and instrument panel.
- **Drive system:** Examine chain or belt tension, lubrication, and sprocket condition.
- **Suspension:** Inspect forks and shock absorbers for leaks and damage.
- Exhaust system: Check for cracks, holes, and secure connections.
- **Controls and cables:** Test throttle, clutch, brake controls, and inspect cables.
- Frame and chassis: Look for cracks, bends, and ensure tight fasteners.
- Suspension and steering: Verify smooth turning and stability.
- **Test ride:** Evaluate performance, engine, brakes, and handling for any issues.
- Documentation and addressing issues: Note and prioritize identified problems.





#### > Checklist for Motorcyclist <sup>33</sup>

A checklist for motorcyclist provided in an app that reinforces, through a digital checklist, a series of measures that are part of the Brazilian Traffic Code, such as the use of appropriate clothing, the use of motorcycle helmets, in addition to reminding the importance of verifying that the vehicle it is in good condition. This is all before going online and starting activities.



Figure 31: Motorcycle checklist, Uber initiative

### **Other Good Practices**

Motorcycle Inflatable Vest:

Airbag jackets, vests, pants, and suits are designed to reduce the trauma of impact for riders who fall or are thrown from their vehicles.



• Airbag Riding Pants: The

pants need to be hooked to the motorcycle with a strap and what looks like a carabinier clip. Should the rider fall from the bike or be ejected, the motion pulls on the strap and triggers the airbags' deployment.



33. https://www.abcagora.com.br/uber-lanca-checklist-de-seguranca-para-motociclistas-e-ciclistas-que-utilizam-o-aplicativo/

Motorcyclists' safety – Country experiences This section aims to highlight good practices implemented by different actors, including the government, private sector and civil society, across six countries: Brazil, Tanzania, Viet Nam, Cambodia, Indonesia and Uganda to advance safety for motorcycle users. The case studies will address innovative solutions in different pillars as a response to different challenges to reduce motorcycle road traffic crashes in different contexts.



#### > Infrastructure and Road Design

- Blue Lane implementation Brazil
- Bufferzones implementation Tanzania

#### > Education and Awareness

- A Culture of Road Safety through Helmets Usage, Vietnam
- "Head Safe, Helmet On", Cambodia

#### > Enforcement

- Safety Enforcement for Boda-Bodas, Uganda
- Safety Programme for Motorcyclists, Indonesia

#### Figure 32: Blue Lane in São Paulo, Brazil



# Infrastructure and Road Design

# Blue Lane implementation in São Paulo, Brazil

#### **Brazil Context**

According to the World Health Organization and the Brazil Ministry of Transports:

- > WHO Est. Deaths per 100.000 Population: 19,7
- > Around 30 million of registered motorcycles (27% of the national registered vehicles)
- > 32% increase of motorcycles fleet from 2021 to 2022
- > 31% of road traffic deaths involving riders of motorized 2-3 wheelers
- > No helmet fastening required

#### Target Location: Sao Paulo, Brazil

#### Intervention

- Avenida 23 de Maio was chosen as the starting point of the pilot project because it is a road with a high circulation of motorcycles.
- According to CET-SP, inside or outside the demarcated area, the speed limit on the road must always be respected – in the case of Avenida 23 de Maio, the maximum is 60 km/h.



#### **Results Achieved**

1 year after the pilot implementation:

- > There were no records of deaths.
- > There was a reduction in the severity of crashes:

98 crashes were registered 98 on the 5.5km stretch. Of this total, 44 incidents did not cause injuries. The remaining 54 crashes resulted in 59 victims. Of these, 51 with minor injuries and 8 with serious injuries.

Before the blue lane, the average was 70 serious injuries per year and 4 deaths.

- > CET studies based on the severity rate have shown that the risk of serious crashes among motorcyclists is three times lower for those using the blue lane.
- According to the Traffic Engineering Company (CET), the implementation of the blue line has been extended to other parts of the city. It was announced by the São Paulo City Hall that more 220km will be implemented in 2023.

## **Bufferzones Implementation in Tanzania**

#### Tanzania Context

According to the World Health Organization:

- > WHO Est. Deaths per 100.000 Population: 29,2
- > 59% motorized 2/3 wheelers
- > 23% of road traffic deaths involving riders of motorized 2-3 wheelers
- > No helmet fastening required

The Police Department and the Tanzania National Roads Agency (TANROADS) identified the motorcyclists as critical profile for Road Safety in Tanzania, responsible for a series of crashes da road traffic deaths across the country.

The Traffic authorities, supported by the private sector, implemented unprecedented infrastructure improvements, reinforced by educational activities with the local motorcyclists to guarantee adherence and effectiveness of the engineering interventions.

Target Locations: Mwanza and Arusha

Intervention Implementation & Results Achieved

- > 6 buffer zones implemented in Arusha and Mwanza in 2021;
- > 1 event with the government;
- > Traffic agents' orientation on the buffer zones spots for 436 motorcyclists;
- UNITAR's Management Practices for Safer Roads App release with 3 trainings for the Traffic Police of Tanzania;
- > Road Safety week with 1,135 participants.
- > The buffer zones initiative were scaled in 2022 to other two different municipalities in Tanzania.



# **Education and Awareness**

# A Culture of Road Safety through Helmets Usage, Vietnam

#### Vietnam Context

According to the World Health Organization:

- > WHO Est. Deaths per 100.000 Population: 26,4
- > The country has the highest number of road traffic crashes in the world, with around 21,000 reported crashes, 8,417 and deaths in 2016
- > Around 74 million of registered two and three wheelers' vehicles (93% of the national registered vehicles)



Number of registered vehicles 2005-2016. Source: United Nations. (2018). Road Safety Performance Review Viet Nam.

> The majority of road traffic crashes in Viet Nam involve motorcycles, representing 66.71%.



Analysis of road traffic crashes by type of vehicles, 2016. Source: World Health Organization. (2018). Global status report on road safety 2018.

- > Helmet fastening required since 2015, although rate of helmet wearing for drivers was 81% and 60% for passengers.
  - One of the biggest challenge is the cultural and social behavior towards wearing helmets. There is a perception that wearing helmets is uncomfortable due to warm temperature and humidity. For some individuals, the cost of purchasing a quality helmet may be an obstacle, leading them to choose lower-quality helmets that offer less protection.



Analysis of road traffic crashes by cause, 2016. Source: United Nations. (2018). Road Safety Performance Review Viet Nam

> No restriction on children's passengers on motorcycles

#### **Target Location: National**

Intervention Implementation

- > A diverse strategy was implemented to address the challenge of helmet usage
- Public awareness campaigns have been launched to educate the public about the importance of wearing helmets. These campaigns aim to change societal attitudes towards helmets and promote a culture of safety.
- Efforts have also been made by AIP Foundation, an international non-profit organization dedicated to road safety, to improve the affordability and accessibility of helmets that are also adapted for children.
- In collaboration with the Fédération Internationale de l'Automobile (FIA) Foundation and the World Bank, launched the Global Helmet Vaccine Initiative (GHVI) with the objective of putting a helmet on every head.

> AIP Foundation has established strong partnerships with governments and communities to improve road safety through their "Five Gears model" (see Figure 5). These collaborations have resulted in a coordinated and comprehensive approach to road safety, leveraging resources and expertise to maximize impact.



Five Gears model. Source: AIP Foundation, Our Approach



Helmet Vaccine Initiative – Vietnam, AIP Foundation

#### **Helmets for Kids**

This program, part of the GHVI, aims to educate students and teachers on the importance of traffic safety and to encourage participants to be safer road users. Helmets for Kids provides helmets and training on helmet wearing to mitigate the low helmet wearing rates for children in Viet Nam.

The tropical helmet has the following characteristics:

- > New helmet standard, TCVN 5756:2017.
- > Lightweight.
- > Low-cost.
- > Adapted to warm and wet climates

#### **Results Achieved**

- The Helmets for Children campaign resulted in 1 million helmets distributed to primary students in Viet Nam (AIP, 2020). This is significant as helmet wearing has been proven to be crucial to "reduce the risk of death by 42% and serious injury by 69% in the event of a crash" (AIP, 2020).
- Before the nationwide helmet laws in 2007, motorcycle helmet wearing in Viet Nam was less than 30% on average and just 10% on city roads (AIP, n.d.) After the implementation of the national helmet law with the help of AIP Foundation and their various education programs, wearing a helmet immediately rose to 96%.
- The law has resulted in estimated savings of \$3.5 billion USD and the prevention of approximately 502,774 road traffic injuries and 15,302 fatalities over a decade (AIP, n.d.).
- > Also, taking this model to enhance road safety, AIP Foundation has implemented various programs worldwide such as:
  - Helmets for Kids (Viet Nam, Cambodia, Thailand, Myanmar)
  - Helmets for Families (Viet Nam, Cambodia)
  - The 7% Project (Thailand)
  - Head Safe, Helmet On (Cambodia)
  - National Child Helmet Action Plan (Viet Nam)

### Head Safe, Helmet On, Cambodia

#### Cambodia Context

According to the World Health Organization (2018):

- > WHO Est. Deaths per 100.000 Population: 19,55 (2019)
- > 2.7 million two and three wheelers registered in the country, representing 73% of the vehicles registered.
- Estimated 2,803 road traffic fatalities in 2016, of which two and three wheeled motorized vehicles represented 73% of those fatalities



#### Deaths by road user category

<sup>47</sup> 

#### **Target Location: National**

#### Intervention

- "Head Safe, Helmet On" is a road safety initiative implemented with AIP Foundation focuses on promoting helmet use among motorcycle users to reduce the incidence of head injuries and deaths.
- Multi-stakeholder engagement initiative, especially with the national government authorities in implementing the first motorcycle passenger helmet law, accompanied by a two-year national campaign promoting helmet use among passengers.

#### **Results Achieved**

> The number of helmet users has increased, contributing to a decline in injuries and fatalities. It is estimated that the program protected 349 adults from injuries or fatalities between 2014 and 2016 (AIP, n.d.).

# Enforcement

## Safety Standards and Enforcement for Boda-Bodas, Uganda

#### Uganda Context

According to the World Health Organization (2018):

- > WHO Est. Deaths per 100.000 Population: 29,39.
- > 946,046 two wheeled motorized vehicles registered in Uganda (2016), representing 59,3% of the registered vehicles.
- Estimated 5,503 road traffic fatalities in 2016, of which two and three wheeled motorized vehicles represented 33% of those fatalities



#### Deaths by road user category

- > Helmet fastening required since 2004. However, only 49% of the motorcycle drivers wear a helmet and only 1% of passagers.
  - Main reasons listed by motorcycle users to not to wear helmets:
  - Uncomfortable
  - Hot
  - Expensive
  - Low quality.

#### Target Location: National

Intervention

> Boda-bodas are affordable motorcycle taxis in East Africa which can provide transportation options to motorcycle users and offer job opportunities.



#### Boda-boda drivers - Uganda

- > Ugandan government enhanced road safety laws applied o Bodas-Bodas.
- This includes enforcing traffic rules, monitoring violations and imposing penalties for infringements. These measures are designed to deter risky behaviors and promote safer driving
- Private sector engagement to contribute on providing affordable and safer alternatives for Boda-Boda use in Uganda.
- > SafeBoda safety program: SafeBoda is a ridesharing company created in 2014 for motorcycles taxis and provides safe, efficient and quick boda-boda rides. Among the safety initiatives, follow the main highlights:
  - First aid and bike maintenance training in partnership with the Red Cross.
  - Mandatory helmets for drivers and customers/passenger (see Figure 11)
  - High visibility jackets for drivers to ensure visibility on the road.
  - Extensive driver training on road safety, first-aid, traffic, motorcycle maintenance and customer care.
  - Drivers are identifiable and trackable through SafeBoda's system.
  - Road safety awareness.

#### **Results Achieved**

- Over 15,000 motorcycle users are SafeBoda drivers in Uganda. Between 2017 and 2018, a peer-reviewed study established that SafeBoda drivers were 39% less likely to be involved in a road traffic crash than non-SafeBoda motorcycle drivers (Global Innovation Fund, 2023).
- SafeBoda estimates that 160 deaths and 190 serious injuries were prevented between 2016 and 2020 due to SafeBoda's innovation in Uganda.

### Safety program for motorcyclists, Indonesia

#### Indonesia Context

According to the World Health Organization (2018):

- > WHO Est. Deaths per 100.000 Population: 11.33.
- > 74% of the road traffic deaths involving two and three wheeled vehicles.



#### **Deaths by road user category**

> No helmet fastening required.

#### Target Location: National

#### Intervention

- > A multi-approach strategy was established, including:
- > Public awareness campaign to emphasize the importance of helmet wearing.

- > Enforcement: Law enforcement agencies have increased efforts to enforce helmet laws and impose penalties for non-compliance.
- Standards regulation for helmets: The standard for helmets in Indonesia is SNI 1811-2007 (Indonesian National Standard). It includes specifications for impact absorption, strap retention strength, field of vision, chin strap buckle, shell construction, and other important factors. Helmets that comply with SNI 1811-2007 should bear the SNI certification mark, indicating that they have undergone testing and meet the required safety standards set by the Indonesian government.
- > Motorcycle Lane: Implemented to improve safety for this profile, separating them from other vehicles.

# **Final considerations**

This material was designed focused on motorcyclists' safety considering the critical role in addressing the rising concerns related to road traffic deaths involving motorcyclists. With the increasing number of motorcycles on the roads worldwide and the corresponding surge in fatalities, it is imperative for public road traffic authorities, fleet managers and road safety specialists to take proactive steps to enhance motorcyclists' safety.

Market trends for motorcycle sales indicate a growing demand for motorcycles, making it essential to focus on safety measures and accident prevention strategies. Road safety awareness should be integrated into marketing efforts, promoting the responsible and safe use of motorcycles to potential buyers.

Furthermore, successful implementation of road safety interventions focused on reducing deaths and injuries in crashes involving motorcyclists, should include key aspects including:

- Multi-stakeholder collaboration, establishing roles and responsibilities of each party. Joint efforts can lead to the development of cohesive strategies and the efficient allocation of resources to tackle motorcyclists' safety concerns effectively.
- > Implementation of a governance committees and routines to ensure continuity of programmes and interventions.
- > Collection and analysis of data to understand the critical profile of motorcyclists, essential causes of death and the elaboration of an assertive action plan.

This Toolkit focused on motorcyclists' safety aims to serve as a resource to combat the increasing road traffic deaths involving motorcyclists. By engaging public road traffic authorities and fleet managers and considering market trends for motorcycle sales, this toolkit can pave the way for a safer road environment for motorcyclists. Implementing the suggested recommendations and embracing a holistic approach to road safety will undoubtedly contribute to saving lives and reducing the number of motorcycle-related accidents in the future.



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