

Executive summary

Background

The powered two-wheeler (PTW) population - which includes motorcycles, scooters and mopeds - has been constantly increasing. In most OECD countries, the motorcycle fleet increased much faster than the passenger car fleet from 2001 to 2010. As such, PTWs are becoming an important component of the transport system. However, they represent an important challenge for road safety.

The International Transport Forum set up a Working Group on the Safety of Powered Two-Wheelers in 2010 to review trends in powered two-wheeler crashes and examine the factors contributing to these crashes and their severity. This report is the result of that effort. It describes a set of countermeasures targeting user behaviours, the use of protective equipment, the vehicles and the infrastructure and discusses motorcycle safety strategies in the context of a Safe System approach.

Main findings

The number of powered two-wheelers on the roads is growing and PTWs play a significant role in mobility in many countries, particularly in many of the world's large cities. Some riders use PTWs as their primary form of transport, others for recreation. For many it is the only affordable or practical means of individual motorised mobility.

Powered two-wheeler riders are at far more risk than car drivers per kilometre ridden in terms of fatalities and severe injuries entailing long-term disability. Moreover, they have not benefited at the same pace as car occupants from safety improvements over the recent decades. In OECD countries, PTW riders represent 17% of total fatalities on average, while PTWs account for about 8% of the motorised vehicle fleet. PTW fatalities often comprise a much higher proportion of total fatalities in low- or middle-income countries. In addition to the human casualties, the economic costs associated with PTW crashes are significant. Investing in PTW safety can therefore bring important societal and economic benefits.

Powered two-wheeler crashes are frequently linked to failures of perception and control. The most frequent PTW fatal crashes are collisions at intersections, commonly involving problems of perception and appraisal by both the driver and the rider and single-vehicle crashes, due to the PTWs' higher sensitivity to external perturbations caused for instance by road surfaces or weather conditions. Speeding and consumption of alcohol or drugs are critical factors in the occurrence and severity of PTW crashes, just as for other road users.

Recommendations

Implement a Safe System approach that caters for the safety needs of powered two-wheelers

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 minimise the production of these errors and to protect road users from death and serious injuries when errors occur.

While a Safe System approach concerns all countries, a tailored approach is required which considers local specificities with regard to the safety of powered two-wheelers.

Involve all stakeholders in sharing responsibility for the safety of powered two-wheelers

Improving the safety of PTWs is a shared responsibility. All relevant stakeholders, including civil society organisations, need to be actively involved in the process of drawing up and implementing a shared road safety strategy which includes safer behaviour of all road users, safer infrastructure and vehicles with enhanced safety features. PTW safety is not only the responsibility of governments, administrations, and manufacturers, but also PTW associations, insurance companies, the media, etc.

Make the needs of powered two-wheelers an explicit part of transport policy

Powered two-wheelers are becoming an important component of the transport system which in many countries has given priority to four-wheel vehicles. In some cities in OECD member countries they represent up to 30% of the motor vehicle fleet. Yet only a few countries have a national transport strategy for PTWs in place. PTWs need to be properly integrated into mobility plans.

Create a toolbox of measures to improve the safety of powered two-wheelers riders

A toolbox of measures is required to improve the safety of PTW riders within the traffic system. These measures must take into account the specific challenges associated with PTW mobility and also consider the variety of PTW users, insofar as some segments may be addressed with specific measures. A strategic approach should consider the most effective combination of measures according to the particular needs of individual jurisdictions.

Promote appropriate behaviour of powered two-wheeler riders and road users generally

Licensing, training and education are essential tools for improving riding safety. Access to PTWs should be gradual, with a comprehensive training and licensing system. Training should be designed to promote safe behaviours and address issues such as hazard perception and defensive riding. Other road users should also be made aware of the specific risks associated with the vulnerability and crash patterns of PTWs. Traffic rules must be enforced among powered two-wheelers as well as among other road users.

Make the use of helmets compulsory for all riders of powered two-wheelers

A helmet is the most important protection against severe injuries and deaths. It dramatically reduces the risk of being killed or severely injured and should be worn by all riders and passengers of motorcycles and mopeds. All countries should have and enforce a helmet law that makes wearing a helmet obligatory for riders of all powered two-wheelers. A 100% wearing rate is the only acceptable objective. In addition, the wearing of protective clothing with adequate safety standards – adapted to regional conditions - is essential to reducing the severity of injuries and should be promoted.

Enhance safety features in vehicles

The car and motorcycle industries are continuously developing safety devices to both avoid crashes and mitigate their consequences. The prevention of crashes (“active safety”) is crucial for the safety of motorcyclists. Enhanced safety features should be adopted in powered two-wheelers; notably advanced braking systems should be introduced generally. Crash avoidance systems on board other vehicles may also contribute to reducing collisions with PTWs.

Reduce crash risk for powered two-wheelers by introducing self-explaining and forgiving roads

Infrastructure should be improved with the development of self-explaining roads which guide drivers and riders to adopt appropriate speed behaviour along with traffic calming measures and PTW-friendly infrastructure (“forgiving” roads). Engineers, road designers and providers, local authorities, road safety auditors and inspectors should be trained to consider PTWs in the design, construction, maintenance and operation of roads, and be provided with the necessary risk assessment tools to make the right decisions.

Do more research to extend understanding of powered two-wheeler mobility and crash mechanisms

There is a great need to develop and apply relevant methods, tools and indicators to measure PTWs in traffic flows and analyse their mobility and behaviour. In particular, exposure data are needed to better understand the specific crash characteristics of PTWs. Operational research and development is needed to achieve a traffic system which better integrates and protects PTWs in a cost efficient manner. Intelligent Transport Systems (ITS) require more research and development on their capacity to prevent and mitigate PTW crashes. Further investigation is required regarding the content and effectiveness of training, including post-licence training.