Background

Over recent decades, an increasing use of motorcycles of various kinds or powered two-wheelers (PTW) is observed, throughout the world and in Israel, mostly in metropolitan areas. Motorcycles provide mobility benefits in densely populated areas but belong to vulnerable road users due to the high risk of riders' injury in road accidents. One of the measures for improving motorcycle safety in urban areas is seen in allowing the use of bus lanes by PTWs. This measure was introduced in various European cities, whereas the detailed examinations of its impacts are not common and were reported mostly in the United Kingdom. In Israel, the use of bus lanes by motorcycles was introduced in Tel-Aviv, initially in the form of a controlled trial that comprised two streets - major traffic routes, with a total length of 5.5 km. Both streets are divided roads with a built median, curbside bus lanes and two-three lanes of general traffic per direction. The trial took place in 2016 and was accompanied by an evaluation study.

Aim

The purpose of this study was to examine the mobility and safety impacts of the new measure – a permission for motorcycles to use the bus lanes on two traffic routes, in Tel-Aviv.

Method

To assess the impacts, before-after comparisons of behaviour and accident indicators were applied. Based on the international experience, the new measure was supposed to improve the PTW mobility and to reduce conflict occurrences between PTW and other vehicles. Besides, it should not harm the travel times of buses and the safety level of the streets involved. All these implications were estimated in the study based on field observations of traffic components and road user behaviours, during the trial as opposed to a before period.

The observations were collected by means of video-recordings including special cameras installed on five road sections, four cameras of the Tel-Aviv traffic control center that filmed traffic movements at junctions and mobile cameras attached to the motorcycle helmets in a group of PTW volunteers. The video-records were coded by the study team providing a database for estimating behaviour indicators, which included: percent of using bus lanes and other travel lanes by motorcycles; keeping the travel lane by motorcycles; conflict occurrences between PTW and other vehicles, with a particular focus on bus lanes and motorcycle-other vehicles' interactions near the bus stops; passing times of buses and motorcycles through the pre-defined street sections. Before-after comparisons examined the extent and the significance of changes.

In addition, road accident changes were examined during the trial related to previous years, with regard to total injury accidents, severe accidents and accidents involving buses and motorcycles.

Results

The results showed that during the trial, the rate of using bus lanes by motorcycles increased by 4-5% under the conditions of moving traffic and by 6%-8% under traffic congestion. However, PTWs
continued to be observed in other traffic lanes. On the street sections, the amount of interactions between motorcycles and other vehicles did not change, whereas the conflict occurrences near the junctions decreased. Despite the initial concerns, the amount and the severity of conflicts between motorcycles and other vehicles near the bus stops did not increase. The passing times of buses and motorcycles through the pre-defined street sections did not change significantly. Accident numbers did not change substantially on both streets during the trial, yet signs of a decrease were observed in motorcycle-involving accidents.

Conclusions

Allowing PTWs on the bus lanes produced slight improvements in motorcycle mobility, without harming bus travel times or detrimental changes in safety. The absence of substantial behaviour changes during the trial indicated that the new measure “regulated” the situation that was previously present in actual traffic.