Bolt Scooter
Safety Pledge

BACKGROUND RESEARCH SUMMARY


Bolt steer

Introduction

Bolt has established a range of operations in European cities offering on-demand ride-hailing, food delivery, and shared mobility services, including shared electric scooters, bikes, and cars.

Compared to other modes of transport, shared scooters are a new part of the urban transportation ecosystem. As this new form of mobility develops, it's important to address questions about how the safety of these services can be maximised for riders and other road users. To ensure that Bolt is operating its scooter service as safely as possible, Bolt commissioned Steer to develop a research report highlighting the most important safety issues and best practices for Bolt and other shared scooter operators to be aware of.

The research spanned the full range of issues across the operational aspects of shared scooters, vehicle design, and rider behaviour. The process consisted of a literature review and desktop research, including a review of Bolt's data, followed by three interviews with experts to verify and build upon the key findings.

Bolt has subsequently used this report as a key input into the development of an evidence-based Scooter Safety Pledge that outlines the key safety principles that will help to guide its global scooter operations.

This summary provides a high-level overview of some of the Steer's research findings.
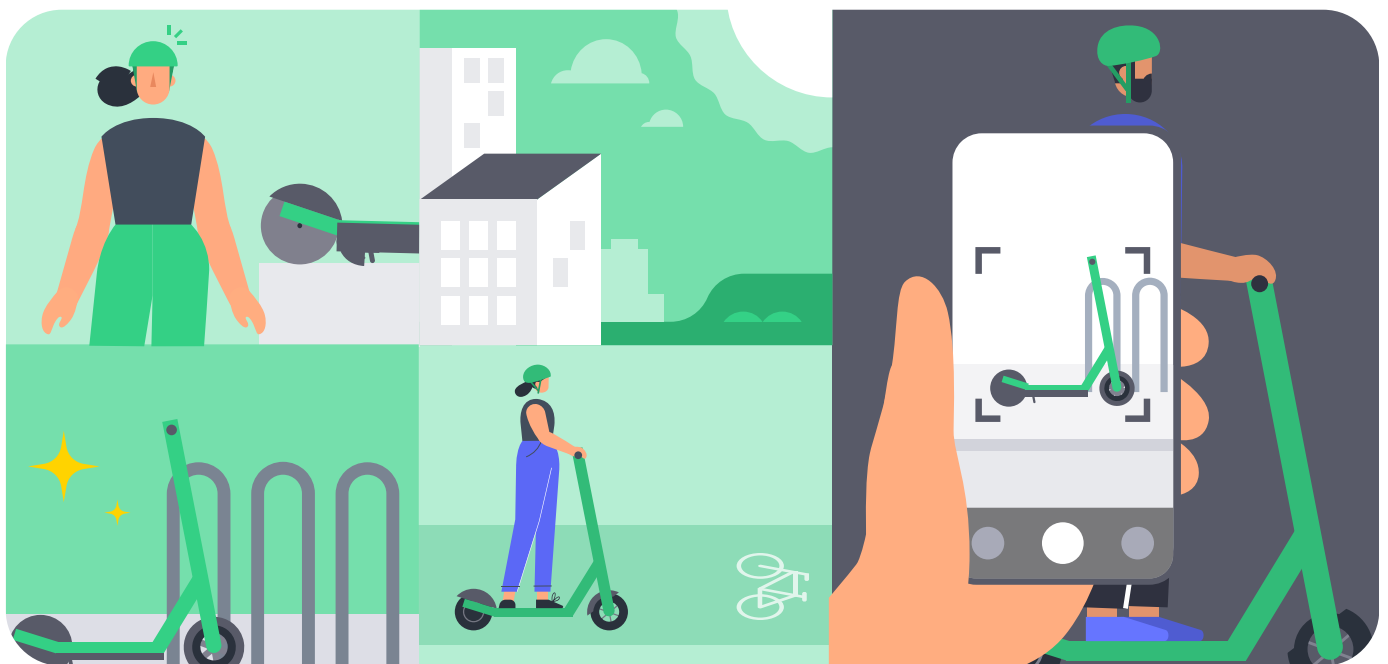
Collective responsibility for safety

The addition of shared scooters to the urban transport mix provides a range of benefits to cities and their residents[1]. As the number of shared scooter users grows around the world, the safety of shared micromobility operations becomes increasingly important.

Safety measures related to shared scooter safety should be developed in a balanced way, which don't limit the inherent attractiveness of shared scooters. For example, some actions, such as legally enforcing the use of helmets, could reduce the number of riders, thereby stalling adoption of scooters and their associated benefits such as reduced congestion, improved air quality, and more efficient use of road space. As such, policies and initiatives to improve the safety of shared scooter design, use, and operations should be considered with care.

There's no single solution, nor stakeholder solely responsible for scooter safety. Operators, cities, and governments have a joint responsibility to reduce the risks involved in scooter design, use, and operations:

- Although shared scooters are designed to be more robust and are more regularly maintained than those that are privately owned, shared scooter operators should nevertheless ensure that their vehicles are robust enough to withstand heavy usage and that their operations are conducted in a safe manner.

- Cities need to implement appropriate infrastructure.

- Governments need to evolve national and local laws to ensure they cater for the safe introduction of shared micromobility.

Similarly, some measures, such as collection and sharing of scooter use and crash data, also require cooperation between several stakeholders. Overall, a joint effort will be required to ensure safe and widespread adoption of shared scooters as a form of urban transport.

[1] The Benefits of Micro-mobility for Cities | Eltis

Shared scooter safety risks

Crash frequency

There's an emerging body of statistics and data related to scooter crash rates, but there remains ample room for further research to make direct comparisons between scooters and other transport modes.

A study by RoSPA[2] found that in the UK, scooters were involved in five times less crashes than bicycles per one million miles travelled. The German statistics agency Destatis also reported that crashes involving scooters represented less than 1% of all vehicle crashes (2,155 or 0.8% of the 264,000) resulting in personal injury in 2020[3]. In London, across the first 18 months of the city's shared scooter trial, 25 serious injuries were reported to TfL by shared scooter operators across 2.1 million trips.[4]

0,8%
2,155
crashes involving scooters

264,000

Source: Destatis.
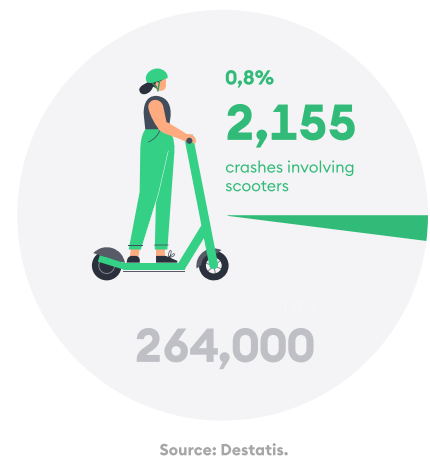
A separate Germany study of shared scooter operations in Hamburg, Germany, from June 2019 to July 2020 registered 89 people who sustained scooter crashes.[5] At the same time, a study conducted in September to November 2018 by the public health department of Austin, Texas, identified a total of 271 people with potential scooter-related injuries.[6] These studies, however, do not provide details on the injuries per trip or per kilometre, making these figures difficult to contextualise. Improving such data clarity is an important step moving forward.

Some shared scooter operators have published crash data in a way that provides information on the frequency of crashes per distance travelled. Bolt reported 10.92 crashes and 5.95 injuries per one million kilometres ridden in 2021.[7]

Whilst some operators release their crash data, recording and reporting is inconsistent, and spans a short period of time. Going forward, collaboration and standardisation of reporting should allow for a greater understanding and insight into the resolution of scooter safety issues. The recent publication of aggregated scooter safety data by Micro-Mobility for Europe is a first step in this direction[8].

[2] RoSPA-UK-eScooter-Report-Summary-v6-250422.pdf
[3] Germany: Data shows e-scooters to be less dangerous than feared | News | DW | 26.03.2021
[4] London e-scooter rental trial headline metrics – Trial Period 17

[5] Accident Mechanisms and Injury Patterns in E-Scooter Users - PMC
[6] APH_Dockless_Electric_Scooter_Study_5-2-19.pdf
[7] Bolt scooter safety report 2022 | Bolt Blog
[8] Industry alliance publishes first-of-its-kind incident data involving shared e-scooters | Micro-Mobility for Europe

Shared scooter safety risks

There is still limited data on comparing the safety of scooters with other transport modes, and the existing research has come to different conclusions. One study based in London showed that the risk of riding a scooter is similar (within an order of magnitude) to the risk of riding a conventional bike[9]. The International Transport Forum (ITF) reports that the risks of fatality from a scooter crash are also similar to bikes, although the risk of hospitalisation is higher with scooters (which requires further investigation)[10]. Additionally, a recent study evaluating the scooter injury rate in Liverpool concluded that rates of musculoskeletal injuries were comparable to rates of injuries sustained on bicycles[11].

Despite these existing findings, the comparison between scooters, bicycles, and other modes is delicate due to the absence of data in a comparable global sample of cities and between different operators. For example, no study has yet compared the severity and frequency of injuries on a per-trip basis across scooter riders and cyclists using a consistent protocol over the same observation area and timeframe. This is a key gap that needs to be addressed to make a more robust assessment of how scooter safety compares to other modes of urban transport.

[9] Micromobility_in_London_Report.pdf (centreforlondon.org)
[10] Safe Micromobility | ITF (itf-oecd.org)
[11] Legalisation of e-scooters in the UK: the injury rate and pattern is similar to those of bicycles in an inner city metropolitan area - ScienceDirect

Nature and type of crashes

To effectively tackle shared scooter safety issues, the causes and consequences of crashes should be understood. According to Bolt's data for 2021[12], the most prevalent types of scooter collisions with third parties were crashes with vehicles (65%), followed by pedestrians (23%) and cyclists (12%). However, it should be noted that it's currently not possible to determine who was at fault in these incidents based on the available data. Scooter safety incidents don't only happen when scooters are being ridden: incorrect parking can lead to pavement and road obstructions resulting in injuries to pedestrians and other road users. According to Bolt data, such incidents are rare, as they happen only 15% as frequently as collisions when scooters are in motion. Furthermore, injuries related to parked scooters tend to be less severe. However, such incidents pose a particular risk for people with disabilities, including wheelchair users and people with visual impairments, so they should not be ignored.
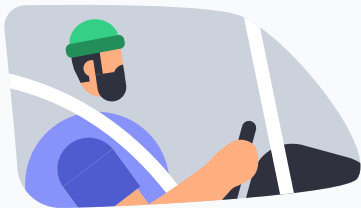
65%
CRASHES WITH
VEHICLES
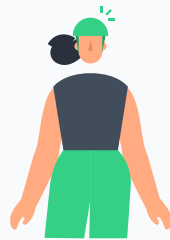
23%
CRASHES WITH
PEDESTRIANS

12%
CRASHES WITH
CYCLISTS

[12] What Bolt's scooter safety data can teach us about safe road infrastructure | Bolt Blog

Shared scooter safety risks

According to the ITF, over 80% of fatal incidents among cyclists and scooter riders involve a motor vehicle, reflecting the fact that the disparity in size and speed constitutes a hazard to micromobility users, and also pointing to the need for cities to provide micromobility users with safe infrastructure such as protected lanes[13]. Meanwhile, pedestrian fatalities are rare in scooter crashes, with only two reported worldwide in 2019 (both from privately owned scooters)[14]. A study in Sweden which involved Folksam Insurance Group analysed shared scooter operations data from Jan 2019 to May 2020 and found that most of the injuries associated with scooters occurred in single crashes (no other people involved), while another road user was injured in 13% of the crashes, either due to interactions with scooters or due to a parked scooter being a hazard[15].

Bolt's data shows Saturday as the most common day for crashes[16]. RoSPA reports that most crashes occur in the late afternoon[17], while Folksam reported that half of the crashes occurred during the weekend and that 46% of emergency department visits among scooter riders happened between 10:00 p.m. and 6:00 a.m[18]. Meanwhile, a study in Vienna, Austria, found that the largest share of scooter users (39.2%) sustained their injuries during the early night (8:00 p.m. to 1:59 a.m.; this data could include both shared and privately owned scooters)[19]. Much of the data gathered so far was collected during the Covid-19 pandemic and curfews when the night-time economy was limited. It's possible that the proportion of crashes happening at night could increase over time. In comparison, according to RoSPA, around 80% of cycling crashes occur in daylight, which is when most cycling takes place[20].

36%
OF CRASHES HAPPEN DURING THE NIGHT

46%
OF EMERGENCY DEPARTMENT VISITS HAPPENED BETWEEN 10:00PM AND 6:00AM.

[13] Safe Micromobility | ITF (itf-oecd.org)
[14] Safe Micromobility | ITF (itf-oecd.org)
[15] Electric scooters accidents: Analyses of two Swedish accident data sets (diva-portal.org)
[16] Bolt internal e-scooter accident data 2022

[17] RoSPA-UK-eScooter-Report-Summary-v6-250422.pdf
[18] Electric scooters accidents: Analyses of two Swedish accident data sets (diva-portal.org)
[19] Incidence and severity of electric scooter related injuries after introduction of an urban rental programme in Vienna: a retrospective multicentre study | SpringerLink
[20] Cycling Accidents Factsheet July 2017 (rospa.com)

Factors contributing to crashes

As with other transport modes, shared scooter safety can also differ between countries or even cities: incident data shows different levels of crashes in different places. For example, in 2021, Bolt's crash rate at the country level ranged from 6.7 to 48.4 crashes per million km ridden[21]. This can be due to the familiarity of shared micromobility, the quality of available infrastructure, and differences in regulations, culture, norms, or climate. Therefore, safety measures proposed and actioned by operators need to be flexible to meet local needs and changing transport patterns. There is also likely to be a need for safety measures to evolve over time as the adoption of shared scooters and other light transport modes increases, city infrastructure improves, and the balance of vehicles on the road moves away from the private car.

Improper user behaviour, especially riding scooters under the influence of alcohol or drugs, could increase the risk of a crash. A scoping study in the U.S. revealed that the median intoxication rate for injured scooter riders was 26.5% across ten studies that reported alcohol use in all electric scooter-associated trauma patients[22]. This likely contributes to the high prevalence of scooter crashes at night. For example, a study conducted in Finland between 2019 and 2021 found that 51% of recorded crashes were related to alcohol or drugs, and almost half of the crashes occurred between midnight and 6:00 a.m[23].

Sobriety tests have been implemented by some operators to tackle drunk riding. Test results from Bolt corroborate these figures, with a high number of potentially intoxicated people attempting to hire a shared scooter when the cognitive test function is activated during the times when intoxication is most likely, especially nights and weekends. As of June 2022, 64% of users passed the test, while the pass rate in individual cities ranged between 22%–80%.

[21] Bolt internal e-scooter accident data 2021
[22] Injury patterns and circumstances associated with electric scooter collisions: a scoping review | Injury Prevention (bmj.com)
[23] Finnish researchers say e-scooter riders more likely to be injured than pedestrians, cyclists and motorcycle riders | ETSC

Shared scooter safety risks

Lack of familiarity with shared scooters also increases the risk of a crash. A study by Austin Public Health in 2019 found that a third of crashes resulting in injuries happened on a user's first ride[24]. The risk associated with the first ride could be driving the perception of scooters as an unsafe transport mode, pointing to user training as a key aspect of improving their safety. Actions have been taken by operators to reduce this risk, such as slow-speed modes and requiring first-time users to pass a basic safety test.

Further supporting the risk related to user inexperience is evidence that the safety of shared scooters has been improving over time. In 2021, Bolt reported a 26% reduction in injury rates year on year, despite a 400% growth in ridership, suggesting that efforts made by operators to improve safety are already having a positive effect. The ITF has collected data on the frequency of crashes from two scooter operators and similarly found a decreasing trend over time (Figure 1).

Finally, thinking beyond training specifically aimed at scooter users, the ITF recommends that training for car, bus, and truck drivers should include mandatory education to improve awareness and avoidance of crashes with micromobility vehicles[25].

FIGURE 1

Number of crashes reported by riders of two scooter companies

Source: Safe Micromobility (itf-oecd.org), ITF elaboration, based on data from two companies

[24] APH_Dockless_Electric_Scooter_Study_5-2-19.pdf (austintexas.gov)
[25] Safe Micromobility | ITF (itf-oecd.org)

Scooter parking

When shared scooters are poorly parked (e.g., blocking pavements and other pedestrian areas), they not only present a public nuisance, but they also pose a potential safety risk. As mentioned earlier in this report, safety incidents involving parked scooters occur less frequently and cause less severe injuries than collisions while scooters are in motion, but the risk for vulnerable people such as wheelchair users and people with visual impairments are important and should be accounted for.

One solution that's been tested in various cities is the use of mandatory parking bays. While this may encourage more orderly scooter parking, it's also essential to note that the key factor determining whether a person will use a shared scooter is the proximity of the nearest available vehicle[26]. Considering this significant constraint, there is a balance that needs to be struck between the convenience of free-floating scooters (and therefore higher usage and a faster shift away from private cars) and more orderly parking due to mandatory parking areas. This highlights that if cities opt to establish parking bays, they must be deployed in high abundance in dense urban areas, and potentially in tandem with a free-floating model in less densely populated areas. Other options, such as the deployment of parking racks and charging docks, could also help encourage orderly parking as well.

Overall, given this need to balance parking safety with user convenience (and therefore the higher adoption of shared scooters), this is an area for collaboration between shared mobility operators and cities to determine and implement the most locally appropriate parking systems.

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[26] Reducing car use through e-scooters: A nudging experiment | Institute of Transport Economics

Operational risk factors

Looking beyond scooter crash statistics, there are other safety risks that shared scooter operators should consider in relation to their operations that take place behind the scenes. These issues are highlighted in the available literature – particularly in terms of the need for consistent, high-quality vehicle maintenance to ensure that all shared scooters in circulation are road-worthy and free of faults that could lead to crashes[27]. However, they are currently difficult to quantify based on publicly available studies. This represents another important data gap to be addressed moving forward.

Conclusion

Public trust in shared scooters and the safety of their operations is fundamental to their acceptance by both users and cities moving forward. By better understanding and addressing the most critical issues related to the safety of shared scooters, operators and the public can benefit from a smoother transition to the widespread use of shared micromobility in cities.

While the research for this report demonstrated that there is growing evidence and knowledge of the safety aspects of shared scooters, the research process also highlighted the gaps that still exist, including the need for more robust, consistent, and comparable crash data as well as the quantification of safety risks related to behind-the-scenes operations. Likewise, more work's required to evaluate the effectiveness of the different safety measures implemented by various shared scooter operators. Looking ahead, greater transparency, reporting, and collaboration on safety data will enable a more complete, evidence-based understanding among all key stakeholders, which will better unlock the potential of shared scooters to provide safe transportation over the long term.

[27] Safe Micromobility | ITF (itf-oecd.org)