



► TII Response to Department of Transport to provide information to inform the Road Traffic (Miscellaneous Provisions) Bill:

The Programme for Government Commitment to legislate for the legal use of e-scooters on public roads

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Introduction

The new category of powered personal transporter (PPT) includes e-scooters and other similar devices. This document has been prepared to aid the Department of Transport (DoT) to identify priority measures that should be included in changes to the legislative and regulatory framework in Ireland.

This document first comments on the Transport Infrastructure Ireland (TII) context, challenges within other policy areas and injury risks, the regulatory approaches adopted elsewhere and finally recommendations are discussed under several headings guided by the Safe System (SS) approach.

TII Strategic and Policy Context

The TII Statement of Strategy contains several strategic objectives, the most pertinent to this topic are safety, sustainability and people (TII, 2019). As one of the primary stakeholders responsible for implementing the Road Safety Strategy (RSS), in addition to the European Union Road Infrastructure Safety Management (RISM) Directive 2011, TII employs the SS approach, Figure I, to achieve the RSS and RISM safety goals.

A SS approach focusses explicitly on eliminating fatal and serious injuries by providing a more forgiving road system for all users (Jeanne Breen Consulting 2018; EC, 2019).



Figure I – Safe Systems

Thus, TII has framed the regulator and policy areas recommendations according to this paradigm; e-mobility should have safe roads to travel on, travel within and at safe speeds, the machine should be safe to operate, the user (and the other unprotected road users) should not be safe and finally post-crash care should be considered such that the proliferation of e-mobility does not create increased injury burden presenting at our hospitals, health care facilities or the general population.

Challenges

New mobility modes, such as e-scooters, make it easier for people to use different modes for their journey and this can contribute to reduce private car use. The use of e-mobility offers end to end mobility, in combination with public transport, for long journeys and great flexibility on short trips. They also offer transport for the last km of a journey (CEDR, 2020; pg 25). Under the Green Deal Europe aims to reduce greenhouse gasses (GHG) by 90% in 2030. In 2019 passenger cars made up 63% of total transport GHG emissions (EPA, 2020; pg. 10).

While e-mobility can offer zero/low carbon transport and aid modal shift away from private car use, e-scooters can put increased pressure on the safety pedestrian spaces (CEDR, 2020) and their proliferation mode widely in urban areas introduces new safety challenges.

Like walking and cycling modes, e-scooters provide no protection when a collision/fall occurs. EU Commission recommends that unprotected road users (pedestrian, cyclists etc.) should be physically

separated from motorised traffic where the speed limit exceeds 30kph (EU, 2021).

E-scooter vulnerability evidence summary

A study conducted in 2019 in the United States (US) found that 58% of e-scooter injuries were located on sidewalks and while less occurred on the road, 23%, road collisions were more severe (Cricchino, J., et al., 2021). According to the OECD most of the injuries sustained by e-scooters and bikes on the road involved motor vehicles, 80% (OECD/ITF, 2020; pg 60).

Research from Copenhagen demonstrated that e-scooter caused injuries to pedestrian and to the rider when no other person was involved too. The study found that elderly persons were more likely to sustain injuries primarily due to tripping over parked scooters in the street. Of the 469 injuries studied 17% were to non-riders and 20.5% of riders sustained head injuries. This study also found that substance use was a contributory factor (Bloomberg SNF, 2019). According to a study of emergency department e-scooter injuries in 2017 head injuries can be substantially higher, 40.2%, Trivedi et al., 2019).

A US study of 271 injured e-scooter riders found that more than one-third (37%) reported that excessive speed contributed to their injury. More than half (55%) of the injuries occurred in the street while one-third (33%) were injured on the sidewalk (Austin Public Health, 2019).

In terms of impact on health services, a before and after study of an e-scooter scheme introduced in Salt Lake City in the US found that the hospital emergency departments experienced a substantial increase in e-scooter related traumas after the introduction of a rental scheme (Badean, A., et al., 2019).

The e-scooter speed contributory factor studies are limited, however research by Schepers, Klein Wolt and Fishman (2018) riding a Class I e-bike, known as a pedelec which has a maximum speed of 25 km/h, did not appear to be more dangerous than riding a

bicycle. Finally, the weight of the machine may also be an injury contributory risk factor, in Singapore, a person was killed by a high-speed, heavyweight e-scooter (Cheryl and Toh, 2019).

In summary, e-mobility offers an opportunity to increase public transport use, reduce private car use and provide a low-carbon mobility option. However, they are unprotected and as such their use presents several road safety challenges; mixing with pedestrians creates new injury possibilities, unregulated parking creates trip hazards, head injuries make up a substantial proportion of the injuries sustained, their speed and weight is a factor, rider only injuries occur, and finally more severe injuries occur when the collision involves a motorised vehicle.

Approach outside Ireland

Several European states recognised the need to change their traffic laws and regulations. The Confederation of European Directors of Roads (CEDR) conducted research into Personal e-Transporters (PeTs), it recommended that clear regulatory framework, rules and safety standards are required to improve road safety. The International Transport Forum (ITF) goes further and recommends that the formulation of new regulation should be future proofed to reflect the rapidly changing context and technological advances (OECD/ITF, 2020; pg. 70).

The most comprehensive regulations for e-scooters to date in the EU were introduced by Germany in 2019. After much deliberation on the subject their regulations limit speeds, permitted locations of use, e-scooters require registration, the age limit of the user is specified, and e-scooters must meet certain vehicle safety features. Other countries such as France, Belgium and the Netherlands have made provisions but to a lesser extent. Interestingly, France has delegated powers to local authorities to make local variation which has allowed Lyon for example to permit e-mobility vehicles to use pedestrianised zone subject to a maximum speed limit of 6km/hr, which is regulated through the rental scheme. A summary matrix of ten countries is provided in Annex I for information.

Recommendations

Safe Roads – recent research, discussed above, demonstrates that e-mobility has the potential to injure pedestrians and poor parking contributes to trip hazards. Therefore, in line with other European states we recommend that e-mobility is prohibited on footpaths, footways and shared pedestrian/cycle paths. Secondly, we recommend that on-road use is limited to road and streets with a maximum 50kph speed limit because these users are unprotected. Parking facilities should be provided and unauthorised parked machines removed or fined. Where the posted speed limit exceeds 60kph, e-mobility should only use cycle lanes, where provided, and should only travel at a maximum e-mobility speed, discussed under *Safe Speeds* below. Their permitted use on cycle lanes triggers the necessity to revise current design guideline, discussed under *Design Standards* below, and like cyclists e-mobility users are vulnerable where junction do not operate within safe limits where there is a lack of facilities or continuity is an issue.

While cyclists are permitted to use bus lanes, TII recommend that e-mobility should not be permitted to use either bus or tram lanes due to the speed and mass differential. Tramlines pose a particular hazard for the e-scooter rider. To maintain safe operation of tram services e-mobility should use protected facilities.

TII recommends a proactive approach to improve the overall safety of the road environment for all unprotected road users, which includes e-mobility.

Safe Speeds – the maximum speed should be limited to 20kph. This limit recognises the injury limits of the human body and is recommended to prevent serious and fatal injury. This applies to collisions with another road user or e-scooter rider only collisions. Denmark, Germany and Sweden have a 20 km/h (or 12 mph) speed limit for e-scooters (ITF, 2020; pg. 57) and research discussed above suggested that at speeds under 25km/hr. e-mobility has similar injury risk to manual bikes.

Safe Road Users – The use of e-mobility on road requires specific cognitive abilities such as the ability to obey traffic rules and judge speeds, therefore the use of e-mobility should be restricted to persons 16 years and over. Children lack the cognitive ability and experience to safely mix with traffic. Further, only 17% of Irish children meet recommended daily physical activity (Woods et al., 2018) and therefore electric mobility for this age group should consider e-mobility in this context and possible conflicts with active travel policies for children.

Finally, based on the prevalence of head injuries sustained by users, discussed previously, helmets should be mandatory.

Safe Vehicles – In addition to maximum speed limits the vehicles should have the following:

- Lights front and rear
- Audible warning such as a bell
- Independent braking systems front and back
- It should not have a seat
- Mirrors for maneuvering in traffic.
- The vehicles should be registered and insured like the schemes in place in Belgium and Germany. Machines that do not obey traffic rules or cause footpath obstruction can be identified to aid enforcement/deterrent.
- Vehicle classification – the taxonomy, speed and weight should be defined (See Annex 2 OECD/ITF recommendation).

Post-Crash Care – the registration of these vehicles will help maintain a database of the number of e-mobility machines in operation on our roads.

Design standards - ITF recommend that road authorities should design wider cycle lanes and tracks so to accommodate a larger of more diverse user cohort. Infrastructure should allow room for overtaking because there would be a speed differential between electric and manual vehicles, and because infrastructure needs to be safe for users of all ages and abilities (OECD/ITF, 2020; pg. 67). As discussed previously, CEDR also recognises the need

for change due to PeTs putting pressure on the safety of existing infrastructure. Therefore, TII and other should re-think the existing cycling infrastructure guidance and standards, i.e., TII Standards Publications and the National Cycling Manual.

The list above sets out the priority measures that should be included in the legislative and regulatory framework to achieve the RSS and RISM directive goals of zero fatalities by 2050 and halving the number of seriously injured persons by 2030. While many of the elements raised above are outside the remit of TII they are all necessary, in combination, to promote the safe use of this mode of transport on the National Road Network.

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Annex 1

Roads	Ban on Footpath use	Use Cycle Facilities	Use Road
France	Yes		
Germany	Yes		
Italy	No		
Belgium	No		
Sweden	No		
Malta	No		
Spain	No		
Netherlands	No		

Table 1 – E-mobility Road Use Regulations EU

Speeds	Max	20km/h	25km/h
France	Yes		
Germany	Yes		
Italy	Yes		
Belgium	No		
Sweden	No		
Malta	No		
Spain	Yes		
Netherlands	No		

Table 2 – E-mobility Speed Regulations EU

Vehicles	Make/Class	Mirrors/ Brakes/ Bells/ Lights	License /Insurance /register
France	No		
Germany	Yes		
Italy	No		
Belgium	No		
Sweden	No		
Malta	No		
Spain	No		
Netherlands	Yes		

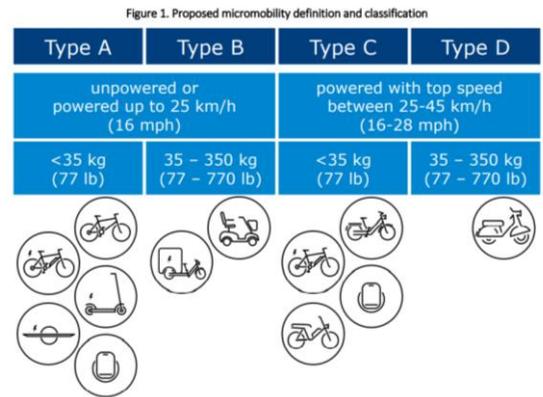
Table 3 – E-mobility vehicle safety Regulations EU

User	Min. Age	Helmet Required
France	Yes(14yrs)	
Germany	Yes(8yrs)	
Italy	Yes(14yrs)	
Belgium	No	
Sweden	Yes(15yrs)	
Malta	No	
Spain	No	
Netherlands	Yes(16yrs)	

Table 4 – E-mobility User Regulations EU

Note: Tables presented draw on various information sources and are not exhaustive.

Annex 2



Cover image from www.kth.se

Figure 10. Taxonomy adopted by police and public health departments in San Francisco



Source: OECD/ITF, (2020)