International Co-operation on Theories and Concepts in Traffic Safety

Legal Awareness and Non-Compliance in E-Scooter Riding Surfaces: Evidence from Slovenia

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Introduction

E-scooters represent an alternative form of urban transportation, especially for short distances; yet, their swift expansion without adequate infrastructure and comprehensive laws and regulations caused safety issues and operational difficulties. In Slovenia, e-scooters are categorised as light motor vehicles according to the Road Traffic Rules Act, defined as seatless, single-rider, standing vehicles with a maximum design speed of 25 km/h, with a handlebar, standing platform, and mandatory safety equipment. Riders must utilise designated cycle paths and lanes when available, or, if unavailable, the right-hand edge of the road on urban roadways with speed limits of 50 km/h or lower; riding in pedestrian zones is allowed exclusively at walking speed without jeopardising pedestrians, while riding on pavements is forbidden.

In practice, e-scooters are used beyond legally permitted surfaces across urban and other areas. This research therefore examines Slovenian e-scooter riders' knowledge of where e-scooter use is permitted and whether this knowledge is reflected in actual riding behavior, providing insight into the effectiveness of information dissemination and rider decision-making.

Research methodology

This research utilises a questionnaire to assess attitudes towards e-scooters and their utilisation in Slovenia. A total of 1,137 respondents participated, with 134 e-scooter users included in the study, suggesting a relatively low rate of e-scooter usage in the dataset. The complete survey consisted of 31 questions covering all aspects of e-scooter usage, whereas this research concentrates on riding behaviour, permitted riding areas, and awareness of applicable legislation. The studied sample includes 80 males (59.7%) and 54 women (40.3%), aged 15 to 65 years (mean = 39.90, SD = 12.84).

Results

E-scooters are predominantly utilised on cycling infrastructure, i.e. cycle paths or tracks (75.74%), cycling lanes (53.68%) and roads in urban areas lacking cycling facilities (48.53%); yet their use in prohibited or ambiguous areas is also prevalent, especially on sidewalks (49.26%), pedestrian zones (30.88%), non-public surfaces (30.15%) and, to a lesser extent, roads outside urban areas (19.85%). In all, 36.76% of respondents (50 persons) indicate that they never ride on prohibited surfaces, whilst 59.56% acknowledge doing so at least

occasionally, however the level of awareness regarding the rule remains unassessed. Most non-compliant riders indicate that they ride exclusively on pavements (39.71%), followed by those who ride just on roads outside urban areas (10.29%) or on both prohibited surfaces (9.56%).

The perceived legality is largest for cycling infrastructure, i.e.cycle paths or tracks (84.56%), cycling lanes (72.06%) and roads within urban areas without cycling facilities (57.35%), while considerable uncertainty continues to exist regarding pedestrian zones (21.32%), pavements (28.68%), roads outside urban areas (32.35%) and non-public surfaces (38.24%). Notwithstanding the significant identification of bicycle infrastructure, the overall legal certainty is inadequate, with just one respondent accurately identifying entirely allowed surfaces. The alignment between legal perception and behaviour is particularly apparent regarding cycling infrastructure (85.19% for cycle paths and 72.59% for cycling lanes), while pedestrian-oriented environments exhibit the highest degree of misunderstanding, indicating that non-compliance is predominantly influenced by regulatory ambiguity.

Self-reported riding in environments perceived as prohibited occurs most frequently on sidewalks (27.74%) and in pedestrian zones (16.30%), followed by roads within built-up areas lacking cycling infrastructure (9.63%) and roads outside built-up areas (6.57%). Such behaviour is least common on non-public surfaces (4.44%) and on cycling infrastructure (2.96% on cycle paths or tracks and 3.70% on cycling lanes).

Discussion

This study's primary contribution is the empirical finding of significant differences between e-scooter riders' actual behaviour and knowledge of permissible riding situations, highlighting regulatory ambiguity as a principal factor in non-compliance. Although riders typically acknowledge the legality of cycling infrastructure, their legal perception of pavements and pedestrian areas is notably lacking, resulting in common misinterpretation and unsuitable surface selection. This highlights two primary concerns: ambiguity regarding pedestrian-oriented areas, linked to elevated violation rates, and the underutilisation of safe, legally sanctioned infrastructure stemming from misinterpretation or uncertainty. Collectively, these data indicate that current methods of providing regulatory information are inadequately successful, leading to a significant and enduring knowledge gap among riders.

Concerning ways to enhance compliance, respondents indicate the most endorsement for increased enforcement, succeeded by elevated fines and awareness initiatives, whilst compulsory registration or testing garners lesser support. This trend indicates that riders may perceive enforcement as both a deterrent and a method for clarifying regulations via visible and consistent execution. The findings suggest that a blend of targeted informational strategies and proportionate enforcement is probably more acceptable and effective than merely imposing additional administrative requirements.

Funding

The research presented in the paper was performed as part of the eSCURB project. The project "eSCURB: Electric scooters in urban environments: A study of safety, infrastructure, and mobility dynamics" is financed by the Slovenian Research and Innovation Agency (project code J5-60090) and Croatian Science Foundation (grant agreement No IPS-2024-02-3188) as part of the Lead Agency Multilateral Scheme (Weave) Agreement, an EU-wide initiative for the (co)funding of research projects.