



Best practice bicycle safety – improvement fact sheet

Speed differences in mixed spaces with pedestrians, E-Scooters etc.

Overview

Speed differences between cyclists and pedestrians impose safety risks especially in areas where both **share the same space**, i.e., mixed spaces, and can lead to **serious injuries** in particular for pedestrians. Such conflicts typically occur in mixed spaces in **dense, urban environments** or near **tourist attractions**. Studies indicate that a considerable proportion of accidents and conflicts between pedestrians and cyclists appear on shared pedestrian and bicycle paths.

What is the problem and where does it occur?

Mixed spaces of cyclists and pedestrians are common in **car free zones in historic parts of urban areas**, along **boulevards** and on **promenades** along rivers, lakes or at the seaside [1]. However, the **speed differences** between people walking and cycling often lead to feelings of **discomfort, conflicts** or even **collisions** in these zones. Mixed spaces are **problematic**, especially the combination of high speeds of cyclists and **high volumes of pedestrians** [7]. This is typically apparent in **dense, urban environments** or near touristic attractions.

In addition, the increasing different new forms of **micromobility**, e.g., e-scooters, but also **pedelecs** lead to a **further heterogeneity in speed differences** between the different transport modes (also in relation to conventional bicycles) and **increase safety risks** in mixed spaces.

What causes the problem?

Conflicts among cyclists and pedestrians in mixed spaces are mainly caused by the speed differential between cyclists and pedestrians. This speed differential translates to **substantial differences in kinetic energy** and could increase **injury risk** in case of a collision [4]. Conflicts and collisions due to these speed differences in particular arise with **excessive speeds by cyclists** (e.g. in downhill direction), high pedestrian density and inattention by **both cyclists and pedestrians** [2, 6, 9]. Such collisions can lead to serious injuries and even death, with pedestrians being usually more seriously injured, especially **when the pedestrian's head strikes the ground** [10].

Moreover, **bicycles with electric assistance** increase speed differences to pedestrians, further increasing the kinetic energy that is released in a collision and thus **increasing the injury risk** [3]. In the last years, **e-scooters**, which are also apparent in mixed spaces and on bicycle infrastructure, have further increased the safety risk due to **increased traffic volumes** and a **further heterogeneity in speeds** [8].

What is the size of the problem?

Specific numbers of conflicts and collisions between cyclists and pedestrians in mixed spaces are hardly available. However, for Australia [5], based on data of 202 injured cyclists from emergency departments from 2010 report that 36.1% of the cyclists – the **second highest share** – had **crashed on shared pedestrian and bicycle paths**. In addition, based on data from an online survey of 1,046 inhabitants of cities in Finland, with regard to experienced conflicts between pedestrians and cyclists, [10] report that **most of the recorded** near accidents (40.8%) occurred on **shared pedestrians and bicycle paths**. Both studies indicate that mixed spaces of cyclists and pedestrians and the existing speed differences between both modes in these areas **often lead to conflicts and collisions**.

Examples:



Conflicts between cyclists and pedestrians at a mixed space on the EuroVelo 14 in Austria [11]



Mixed space of cyclists and pedestrians on the EuroVelo 8 in Croatia, typically with conflicts between walking and cycling tourists during summer [12]

Related fact sheets

SOLUTIONS

- » Strategies
- » Planning principles
- » Overpasses and underpasses
- » Types of facilities: Mixed with motorized traffic and/or pedestrians
- » Separated cycling paths
- » Organisational measures

References and links

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