

## **Secure Bicycle Parking Infrastructure as a Driver of Sustainable Urban Mobility: The Case of Bikeep**

Peter Mraz dipl.ing. geoteh in rud.

Bikeep Slovenia

Nebčeva ulica 24, 1291 Škofljica, Slovenia

Peter.mraz@t-2.net

<https://bikeep.com>

### **Abstract**

Cities worldwide are increasingly promoting sustainable mobility solutions such as cycling, e-bikes, and micro-mobility in order to reduce traffic congestion, CO<sub>2</sub> emissions, and environmental impact while improving urban quality of life. However, bicycle theft, lack of secure parking infrastructure, and insufficient charging facilities for e-bikes remain significant barriers to wider bicycle adoption as a daily transportation method.

Research shows that bicycle theft significantly reduces cycling frequency and often causes users to return to less sustainable transportation methods, particularly private cars. The impact is especially strong among e-bike users and occasional cyclists. Therefore, secure bicycle parking and charging infrastructure is becoming an increasingly important component of sustainable urban development.

This paper presents the Bikeep smart bicycle parking and charging system as a practical example of sustainable mobility infrastructure and demonstrates international best practices from cities, public transportation systems, airports, universities, and commercial environments. The paper combines findings from recent research on bicycle theft and rider behaviour with real-world examples of smart bicycle parking implementation.

The findings indicate that secure and digitally supported bicycle infrastructure can significantly increase bicycle usage, reduce car dependency, improve users' sense of security, and contribute to environmental and social sustainability goals.

Keywords: sustainable mobility, bicycle parking, bicycle theft, e-bike charging, smart cities, Bikeep

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