

Project report

Group 3

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Introduction

This report developed as part of the Summerschool BikeAccess project in Ljubljana, where four international groups participated, aims to assess the current condition of the city's bike paths with a focus on accessibility for vulnerable groups such as people with disabilities, children and the elderly. The third group of the Summerschool BikeAccess project is composed of dedicated students from various countries, each bringing unique expertise in spatial planning. Ivona Nančeska from Macedonia, representing the team of Slovenia, is a second-year student at the Faculty of Civil and Geodetic Engineering in Ljubljana. From Poland, Cyprian Gubernat and Weronika Rdest, both fourth-year students of Spatial Development at the University of Economics in Krakow, contribute their knowledge of urban design and mobility systems. Mina Cvetković and Nadja Ugrinović, third-year students from Serbia, studying at the Faculty of Geography, Department of Spatial Planning in Belgrade, further enhance the teams's collective expertise in spatial analysis and sustainable development. This analysis will identify existing limitations in the cycling infrastructure and explore solutions that can enhance its inclusivity. By addressing these challenges, Ljubljana can continue to progress toward a more equitable, sustainable, and accessible urban mobility system.

Methodology

Based on the printed OpenStreet maps with points marked by our group, we discussed which route would be the fastest and safest for people to travel between the Main train station, BTC shopping center, Health care center Moste-Polje and Home location, with a focus on safety. We mapped the route and set out the next day to do fieldwork by bike. First, we marked the route using the Gaia GPS app, and during the entire ride, we paid close attention to problems, obstacles, and limitations on the path, trying to come up with solutions simultaneously. To avoid frequent stops, we decided to photograph the problematic spots and later mark them in the QField app. The following day, we all gathered and split into two smaller groups. One group worked on mapping the problematic spots, while the other conducted a SWOT analysis based on observations from the previous day's fieldwork.

Weronika and Ivona first imported the route from the app and georeferenced photos from the phone into QGIS. Using predefined criteria from the QField app (types and danger), they categorized the captured photos and marked them as problematic points in QField. Later, they uploaded the points from QField into QGIS. Meanwhile, Mina, Cyprian, and Nadja worked on the SWOT analysis. They analyzed the strengths, weaknesses, opportunities, and threats related to cycling on the existing bike route we followed. Later that day, the progress was presented, and solutions were discussed. This part was the end of the analysis segment.

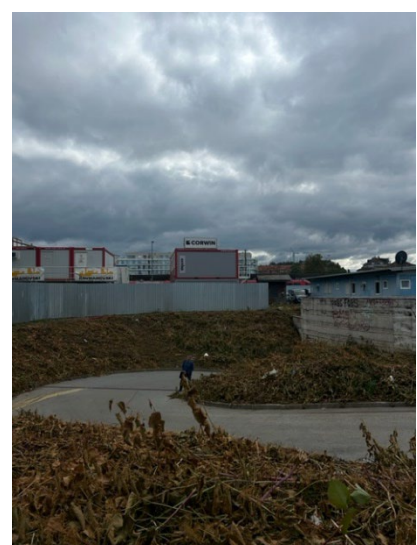
At Thursday, we started the planning part. We divided our tasks and started writing the report, creating a Problem map of cycling infrastructure and finding solutions. Regarding the methodological part, we utilized ArcPro, Google Street View, and our own knowledge. Through detailed analysis of the photographs and careful selection of the most suitable solutions, we were able to draw meaningful conclusions. For the methodological approach, we employed a combination of ArcPro, Google Street View, and our collective expertise in spatial analysis. ArcPro allowed us to efficiently manage and analyze geographic data, while Google Street View provided an additional layer of real-world context, enabling us to closely examine specific areas remotely. Using these tools, along with our fieldwork observations, we conducted a thorough analysis of the photographs taken during the ride. The lectures from professors and wheelchairs and adaptive bikes workshop in the preceding days were instrumental in guiding us toward finding suitable solutions. With this knowledge, we carefully

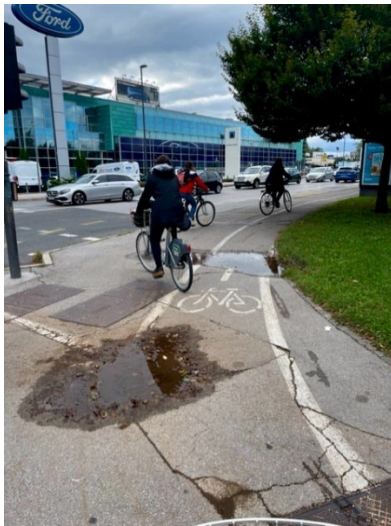
evaluated each issue and explored potential solutions, ultimately arriving at well-founded conclusions based on both on-site data and detailed visual assessments.

Results

We concluded that while the bike paths in Ljubljana are generally well-connected, there is significant room for improvement. The existing infrastructure provides a good network for cyclists, but addressing the identified issues could enhance safety, accessibility, and overall user experience.

- **Bumps and Holes:** Throughout the city, we observed numerous bumps and holes on bike paths. These irregularities create an uneven surface that can be challenging for all cyclists, particularly for those with disabilities, the elderly, and children. The risk of accidents or bike damage increases significantly due to these conditions.
- **No Ramps at Crosswalks:** The absence of ramps at crosswalks presents a significant obstacle for cyclists, especially those with disabilities or carrying heavy loads. Without ramps, cyclists are forced to navigate curbs and uneven surfaces, which can be both unsafe and inconvenient.
- **No Shade:** Many bike paths lack shade, making cycling uncomfortable during hot weather. The absence of shaded areas can deter people from using the bike paths and can lead to heat-related issues for cyclists.
- **Few Resting Areas:** The scarcity of resting areas, such as benches and water fountains, along bike routes limits the opportunities for cyclists to take breaks and stay hydrated. This lack of amenities can make longer rides more strenuous and less appealing.
- **Narrow Paths:** narrow width of some bike paths restricts movement and makes it difficult for cyclists to pass each other comfortably. This can lead to congestion and safety concerns, particularly on busy routes.
- **No Adaptive Bikes:** The absence of adaptive bike options along the bike paths means that cyclists with disabilities have limited opportunities to use the infrastructure effectively. This lack of provision excludes a significant portion of the population from fully benefiting from the bike path network.





Conclusions and recommendations

All in all, the bike connection was good, no major difficulties while riding from home location to the other locations. However, there is still much space for improvement.



Based on our observations, we propose the following improvements to enhance the bike paths in Ljubljana:

At the train station, we recommend installing a wide elevator to accommodate bikes and wheelchairs, and expanding the ramp inside the station to ensure ease of access. Additionally, clear signage throughout the city should be implemented to guide cyclists effectively.

Along the bike route, we suggest narrowing car lanes and widening bike paths and walkways to provide more space for cyclists. Installing fences near construction sites and launching a social campaign with posters at bus stops can help raise awareness about vulnerable groups. We recommend increasing the number of resting areas with benches and water fountains along the bike paths. Implementing sound signalization at every crossing will improve safety, while cohesive signage or painted bike paths will help cyclists navigate the route more easily. Removing obstacles such as signs and bus stops, repairing holes and uneven surfaces, constructing a bicycle-pedestrian bridge above the train tracks, and creating a new parking area at the start of Smartinska Street are also crucial improvements.

At the shopping center, reducing parking spots to create two-way bike paths and renovating the wheelchair ramp to ensure it is accessible for bikes will further enhance the cycling infrastructure and overall accessibility.

