



Case study: Learning Lessons from Ljubljana



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Case study: Learning Lessons from Ljubljana

1.1 Introduction

Ljubljana is the capital of Slovenia which joined the EU in 2004 and has **a population of nearly 300,000 inhabitants**. Ljubljana has grown considerably since the 1970s, mainly by merging with nearby settlements. **The city covers 163.8 km²**. It is situated in the Ljubljana Basin between the Alps and the Karst. It is the most populated area in Slovenia and it is the metropolitan area of Ljubljana. Its main rivers are the Sava, the Kamnik Bistrica and the Ljubljanica. The heart of Ljubljana is the old centre from pre-Roman times with a mediaeval castle on top of a hill. The city takes pride in its bridges. The Triple Bridge is a well-known icon. The headquarters of the main national agencies and institutions, embassies, and a university with over 47,000 students are situated in the city. Ljubljana is a national and regional centre for culture, trade and science where Western and Central Europe intersect and mix with Balkan and Mediterranean influences. These century-old overlaps add to Ljubljana's geographic, climatic and cultural diversity. Ljubljana has a key role in the economy of the country and the entire region. Almost a third of Slovenia's trade is made in the capital and roughly a quarter of all employed people work here. As a result, **more than 120,000 commuters travel to the city by car every day**.

- Ljubljana has no less than **542 m² of public green space per capita**. More than 46% of the city is covered by native forests, 75% of all surfaces are green, and 20% of areas are protected.
- Residents of Ljubljana have access to **nine public garden areas and six orchards within the city limits**.
- The centre of Ljubljana is closed to motorised traffic. **Pedestrian zones cover a total of 12 hectares, which ranks the capital one of the largest car-free zones in the European Union**.
- **More than 300 km of developed cycling paths** wind around Ljubljana, while the BicikeLJ public bicycle rental system currently encompasses 84 stations.
- Ljubljana has **the highest rate of waste sorting among all European capitals**. In 2020, it amounted to 69%.
- **Ljubljana is a city of honey bees**. It actively preserves the heritage of beekeeping and promotes the importance of honey bees for the survival of humankind. Pollinator friendly plants grow on the roofs of several bus stops, while a late season mowing system has been introduced for city meadows.
- **One of the advantages of Ljubljana is its natural drinking water, which is not treated using technological processes**. There are 44 public water fountains in the capital, which can be found in the Tap Water Ljubljana app.

Ljubljana was awarded European Green Capital 2016, was the winner of European Mobility Week twice (2003 and 2013) and was awarded European Best Green Capital in 2021. The city won the bid to host Velo-city 2022, the annual world cycling summit.



Public parks of Ljubljana (photo Micromobi partners)



*Public water fountain
(photo LKM)*



*Pollinator friendly bus stop
(photo Micromobi partners)*



Tivoli park (photo Micromobi partners)



Ljubljana castle (photo LKM)



View on the castle from the Triple bridge (photo LKM)

Micromobi LTTA in Ljubljana (June 2024)

In the last week of June 2024 the MICROMOBI project's Learning Teaching Training Activity (LTTA) took place in Ljubljana. The city was visited by the project partners as a case study city, to learn from and transfer best practices to the other Mediterranean cities of the countries in the project: Malta, Cyprus, and Sicily (Italy). Workshops and site visit tours were held at the headquarters of Ljubljana's cyclists' association **Ljubljanska kolesarska mreža (Ljubljana Cycling Network - LKM)** and in the area of Ljubljana with the purpose of getting to know about both the concepts of urban micromobility as well as Ljubljana micromobility practices. Beside the project partner organisations **Friends of the Earth Malta**, **Friends of the Earth Cyprus** and **Promimpresa**, also the associate partners **Rota**, a cycling advocacy NGO from Malta, and **OPU**, organisation for positive urbanism, an NGO from Nicosia, Cyprus, participated in the training. The Slovenian associate partner in the project, **UIRS** (Urban Institute of Republic of Slovenia) participated in the LTTA and was leading one of the workshops during the training.



Left: Workshop during the LTTA at the LKM Headquarters, Environmental Centre (photo Micromobi partners) ; Right: Boat ride on Ljubljanica river on a walking tour (photo LKM)



Left: Site visit of one of the cycling streets (photo Micromobi partners) ; Right: Cycling study tour (photo LKM)

About LKM

LKM is a civil society association for the encouragement of cycling and sustainable transport, a non-profit organisation formally founded as an NGO in 2000. It started as an initiative of citizens and holds a granted status of an association operating in the public interest in the field of sustainable mobility.



Ljubljana Dragon is the symbol of Ljubljana and incorporated in the LKM logo (photo LKM)

The main mission of LKM is to improve system conditions for safe cycling and its main field of work is cycling advocacy, especially urban cycling, for the purpose of everyday mobility. For many years LKM has been co-creating the cycling climate and culture in the city and is committed to changing travel habits and creating sustainable mobility by increasing cycling and reducing motorised traffic.

More than 20 years ago, the organisation was one of the founders of the “Environmental centre”, a place in the city centre, which became LKM headquarters and serves as a working place of many Slovenian NGOs, dealing with sustainable development and environmental issues. **Within this holistic view, LKM works in the areas of: developing urban cycling, promoting, raising awareness and informing about good solutions on the topic of sustainable mobility and city development, as well as changing travel habits with a broader vision of a truly sustainable development of Ljubljana - for people and the environment, while actively involving the local population.** LKM encourages the public to get involved and participate with ideas and critique and to submit proposals for changes of regulations and legislative policies. LKM is a member of the national environmental platform

Plan B for Slovenia, the Spatial Planning Network and the Coalition for Sustainable Transport Policy. The association currently has one employee, and a solid number of active and enthusiastic volunteer members.

LKM is also active in the area of legislative initiatives. It was very involved in the campaign against the proposed changing of the regulation which would make helmets obligatory above 18 years of age. The campaign to make helmets obligatory for all ages wasn't successful. LKM played an important role in the transition of Ljubljana to a more non-motorised area. In the time of preparation of the changes, leading to the transition, LKM actively participated in the preparation of the first cycling and traffic strategy of the Municipality of Ljubljana and in the design of cycling delivery which grew into a social enterprise.

As part of the Civitas Elan project, LKM prepared a proposal for the Comprehensive Cycling Strategy of Ljubljana, which contributed to a new transport strategy and cycling strategy with a stronger emphasis on public involvement, with LKM playing the role of an important stakeholder. In 2011, LKM hosted Mikael Colville-Andersen, the author of the well-known Copenhagenize blog, who put Ljubljana on the cycling map. The Association conducts thematic study tours around Ljubljana and the surrounding area, various raising awareness actions, organises critical mass events, roundtables, educational cycling workshops and trainings, as well as innovative pilot projects, such as a bike rack with pollinator friendly plants, which tackles loss of biodiversity and climate change.



Bike rack with pollinator friendly plants (photo LKM)

LKM has influence on the improvement of cycling infrastructure and cycling conditions in Ljubljana and a role in promoting user participation through advocacy and responding with strategies, plans and proposals, both in direct dialogue with the city and by encouraging the public to criticise plans and make suggestions for the existing infrastructure. LKM is constantly keeping an eye on new cycling designs and arrangements. The result is influencing the improvement of infrastructure and conditions which are the consideration of many of the Association's proposals: increased number of cycling lanes, surfaces and equipment, more high-quality and better located bicycle parking racks and lots, which Ljubljana has gained in recent years, more contraflows for cyclists on one-way streets, more reducing speed to 30 km/hour on the city streets, the elimination of car parking lots on Sattnerjeva (school streets) and improving the overall conditions for sustainable

mobility in school districts, bicycle street improvements and taking into account LKM professional corrections of cycling infrastructure plans as well as elimination of some critical (black) spots for cycling due to LKM insistence.

As a non-governmental organisation in the field of cycling, LKM is a bridge between those who use or would like to use a bicycle and those who plan and implement cycling infrastructure and policy at the local and national level. Since its beginnings, LKM has been continuously updating the online records of **critical points aka cyclist traps** in the traffic infrastructure in the Municipality of Ljubljana. Since 2003, LKM has been alerting the authorities in the municipality to these problematic points, together with the submission of proposals for their elimination. Interested cyclists can submit information about the location of a dangerous point on the traffic infrastructure to the City of Ljubljana, together with a description, photos and suggestions for improvements (through the e-form on LKM website). Professionally competent members then judge whether it is actually a dangerous point and supplement its presentation and suggestions for improvements. LKM notifies the authorities about the most critical new dangerous points. The list of dangerous places is shown cartographically on the Cycling Map of Ljubljana (in Geopedia, on the LKM website), which is updated periodically. LKM also **periodically measures satisfaction with the cycling infrastructure and services and the conditions for cycling in Ljubljana** based on online surveys named **Cycling Climate**.

In 2022 LKM participated in the organisation and implementation of the Velo-city conference, an annual international cycling conference. In the recent ongoing project "Cities With a Vision" LKM is analysing the cycling infrastructure and had invited an expert from the Dutch Cycling Embassy who held a workshop for the city officials on planning safe and sustainable routes to school for cycling (and walking). In recent years LKM has been active in the field of cycling training for the elderly and other vulnerable groups, and holds annual workshops at the Festival for the Elderly. **LKM encourages the cycling community to self-organise with monthly Critical Mass events, part of the global Critical Mass movement, a form of direct action in which people travel as a group on bicycles at a set location and time. In order to make cycling safer through safety in numbers and to show there is demand for cycling and better cycling infrastructure and conditions. To raise awareness that using bicycles is a simple, fast and affordable way to boost sustainable urban mobility.**



Ljubljana's critical mass event, held monthly by LKM (digital image by LKM)



Members of a Critical Mass ride in Ljubljana (photo LKM)



LKM raising awareness actions (photos LKM)

1.2 The mobility transition

How it started and how it evolved over time

Ljubljana first imagined the idea of a car-free city centre with the “Vision of Ljubljana 2025” (2007), a strategic document that laid out concrete measures to change people’s travel behaviour.

The actual transformation of Ljubljana city centre began in 2007 with the pedestrianisation of Wolfova Street and Prešeren Square, following the renovation of the Kongres square (in 2011), where the former parking spaces were redesigned into the central event and social areas. In 2015, one of the city’s main traffic arteries connecting the city from north to south, Slovenska street, was closed to motorised traffic and became a shared space for cyclists, pedestrians, other forms of micromobility, and public transport. Other streets and squares followed the same model.

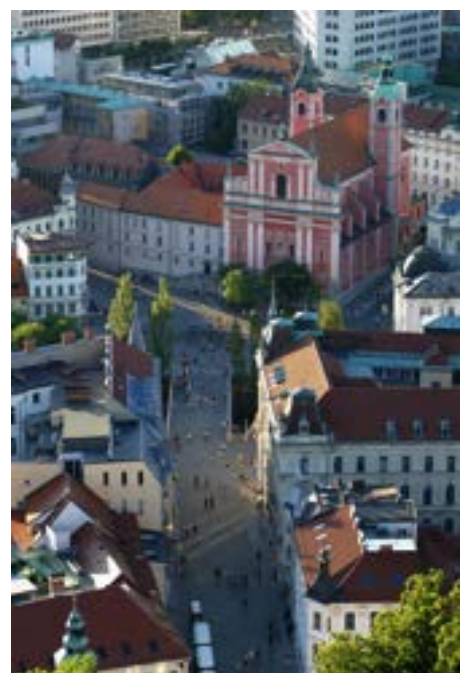
During that time Ljubljana also revitalised the riverbanks of the River Ljubljanica, which runs through the city centre, completed an inner ring with the new bridge and improved access between the two banks of the river by renewing existing crossings and adding new pedestrian bridges. These projects were complemented by the creation of high-quality public spaces. The final elements of the vision were to connect the pedestrianised network in the city centre to Tivoli Park to the west of the centre.

The main success factors were political support and continuity, communication with inhabitants and stakeholders, and learning from and implementing actions in the framework of EU projects, as well as a lively civic society engaged in the improvement of public space in Ljubljana (EU Urban Mobility Observatory, 2020).

Key planning documents

The below timeline highlights key planning documents that have guided Ljubljana’s transition to sustainable mobility:

- With the **vision “Ljubljana 2025”**, adopted in 2007, a comprehensive approach to sustainable development of the city was drafted.
- In the **Environmental Protection Programme** for the period from **2007 to 2013**, a strategic objective of implementing a sustainable mobility system was defined.
- In 2010, for the first time in 25 years, a **Municipal Spatial Plan – Implementation Part and Strategic Part** for the period of 2011–2027, which is a key document for the city development, was drafted.
- In 2010, the **Expert Guidelines for the**



Regulation of Public Transport in Ljubljana Urban Region in cooperation with the **Regional Development Agency of Ljubljana Urban Region** were drafted.

- In **2012**, the **Sustainable Urban Mobility Plan (SUMP) of the City of Ljubljana** was drafted, which sets goals for the limitation of personal motor vehicle traffic and the change of people's travelling habits to more sustainable ways – on foot, by bicycle or by public transport – and the distribution of mobility in such a way that one third of journeys will be made by public transport, one third on foot or by bicycle, and one third by a private vehicle.
- The **Electromobility Strategy in the City of Ljubljana (2013)** discusses the part of sustainable mobility that relates to choosing transportation modes which are environmentally friendly, such as electric mobility.
- The **Sustainable Urban Strategy**, both the strategic part (2016) and the implementation plan (2017), contains measures for the promotion of sustainable mobility.
- In 2017 the **Sustainable Urban Mobility Plan** from 2012 was upgraded. The objective for an even better quality of living in Ljubljana in cooperation with different stakeholders and according to the achievements so far, was redefined. There was a commitment that by 2027, two thirds of journeys are going to be completed in a sustainable way – on foot, by bicycle and by public transport (City of Ljubljana)

Ljubljana has also regularly taken part in European projects connected to urban mobility, such as leading the CIVITAS ELAN project between 2008 – 2012. Through these projects, the city became familiar with EU-wide best practice examples and solutions to urban mobility challenges, and was able to adapt and use new mobility solutions for Ljubljana.

Pedestrianisation and the shared space

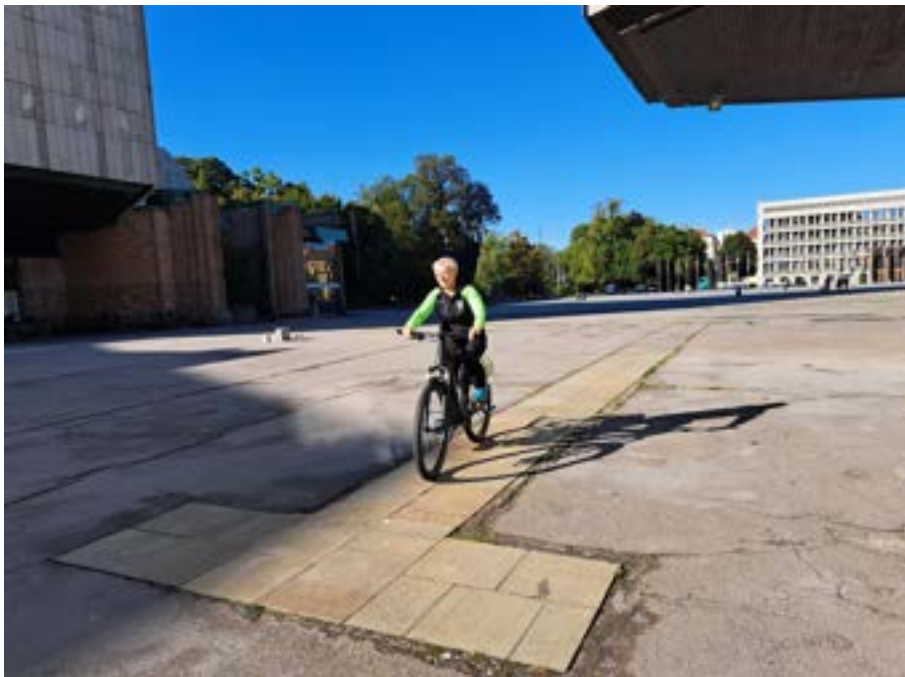
The transformation of Ljubljana city centre began with the pedestrianisation of Wolfova Street and Prešeren Square (figure below).

Ljubljana's Triple Bridge (*Tromostovje*), designed by famous architect Plečnik, used to tremble under the weight of buses and cars crossing it every day. In 2007, with the renovation of the *Wolfova cesta* and the *Prešernov trg*, the redesigning of the city centre began, not only with the renovation of the municipal infrastructure and a pedestrian-friendlier pavement, but also with the gradual closure of the city centre for all motorised vehicles, where only delivery vehicles are allowed between 6am and 10am (for vehicles with permits).



Wolfova Street and Prešeren Square

In **2011**, **Kongres square** (figure below) followed the same model. Once full of cars, today it is one of the main events and social areas. *Kongresni trg* was renovated in 2011 and is now free of vehicles. **The former parking spaces were redesigned into the central event and social areas** at *Kongresni trg* (with underground parking garage) and other central squares: *Trg republike*, *Novi trg* and *Breg*. (figures below)



Trg republike used to be a huge parking space. LKM annually holds cycling training there (photo LKM).



Left: Breg, free of cars (photo LKM). ; Right: Novi trg, free from car parking spaces (photo LKM).



Kongres Square



Kongres Square (photo LKM)

In **2015**, under the flag of reclaiming public space for people, the City of Ljubljana **closed Slovenska street** (figure below), **one of its main traffic arteries** connecting the city from north to south, to motorised traffic. The traffic flow change on the rearranged street was one of the most visible key measures of the transport policy for creation of a high-quality public space.



Slovenska Street

Slovenska cesta, a street that until 2013 did not even have a bike lane, is now known as “Ljubljana’s living room” and has become a shared space for cyclists, pedestrians, other forms of micromobility, and public transport.

It is designed in line with the principles of **shared traffic space** with a line of trees running along its side and new street furniture.



Left: Slovenska Street shared space (photo LKM) ; Right: Cankarjeva Street (photo Micromobi partners)

After the renovation, the area was partially opened to non-motorised traffic to test the functionality of the new space. A special pavement and a 400-metre-long tree alley with 63 small ashes was planted along the eastern edge of the street which are the most distinctive elements of the Slovenska cesta redesign.

By renovating Cankarjeva street/cesta, more space was dedicated to pedestrians and cyclists. It was also the last missing part to revive the idea of the promenade between the Robba Fountain and the Tivoli Castle, which once already was a major draw of the area.

Inner ring road completed and new roller skate park opened

The **Fabiani bridge (figure below)** was constructed in 2012, completing the inner ring road. **This allowed for further restricted access for private motor vehicles to the inner city centre.** The completion of the bridge and the inner ring road brought the past idea of famous architect and urban planner Max Fabiani to life. Fabiani designed this concept in his urban development plan more than a hundred years ago. One of the key elements of his plan was

also a ring road around the city centre. The upper level of the bridge is used by motor vehicles, whereas the lower level serves pedestrians and cyclists.

In 2018 a new roller skate park was opened under the Fabiani Bridge which has revived the whole lower part of the Fabiani Bridge. The park was set on the initiative of roller skaters, it is equipped with a semi-circular mini ramp, mounted between 4 pillars of the bridge, and two smaller concrete elements. The entrance has a double swinging door and there is also lighting provided so roller skaters can use it in the evening hours, as well.



Fabiani Bridge (photo Micromobi partners)

Shortening distances with bridges and footbridges

Through the construction or renovation of bridges across the Ljubljanica River, the banks were linked and the distances shortened. In total, the works related to 13 bridges, of which seven were brand new constructions. At the same time new social public spaces along the river were created, as Plečnik (the main architect of Ljubljana in the past) had envisioned.

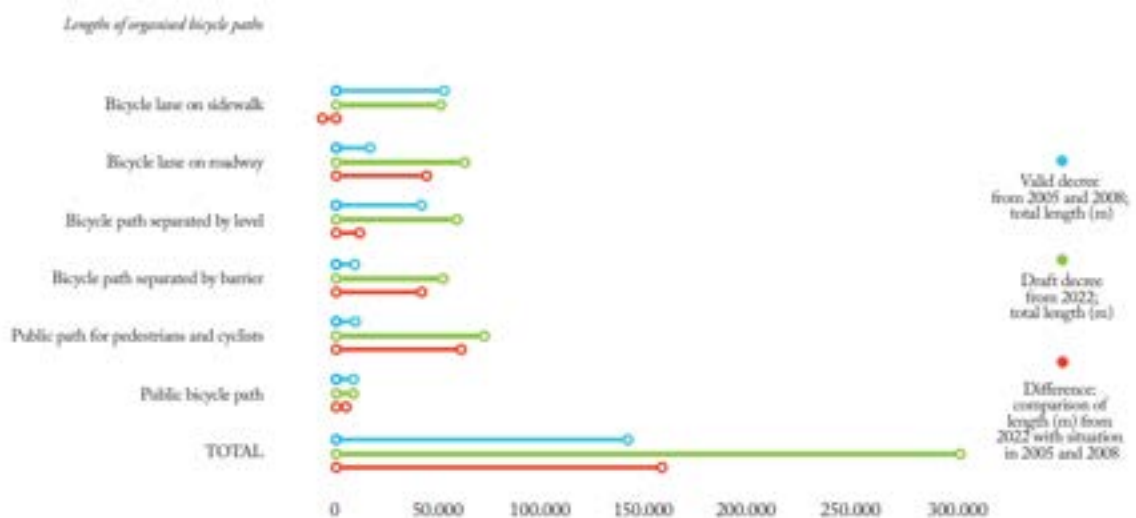
The **Gallus embankment** was renovated at the end of 2017, nicely rounding up the renovations of the Ljubljanica embankments from the **Dragon Bridge/Zmajski most** (figure below) to the Šentjakob Bridge, which directs pedestrians and cyclists along the promenade to Špica along one of Plečnik's urban axes – the water axis.



Dragon Bridge (photo LKM)

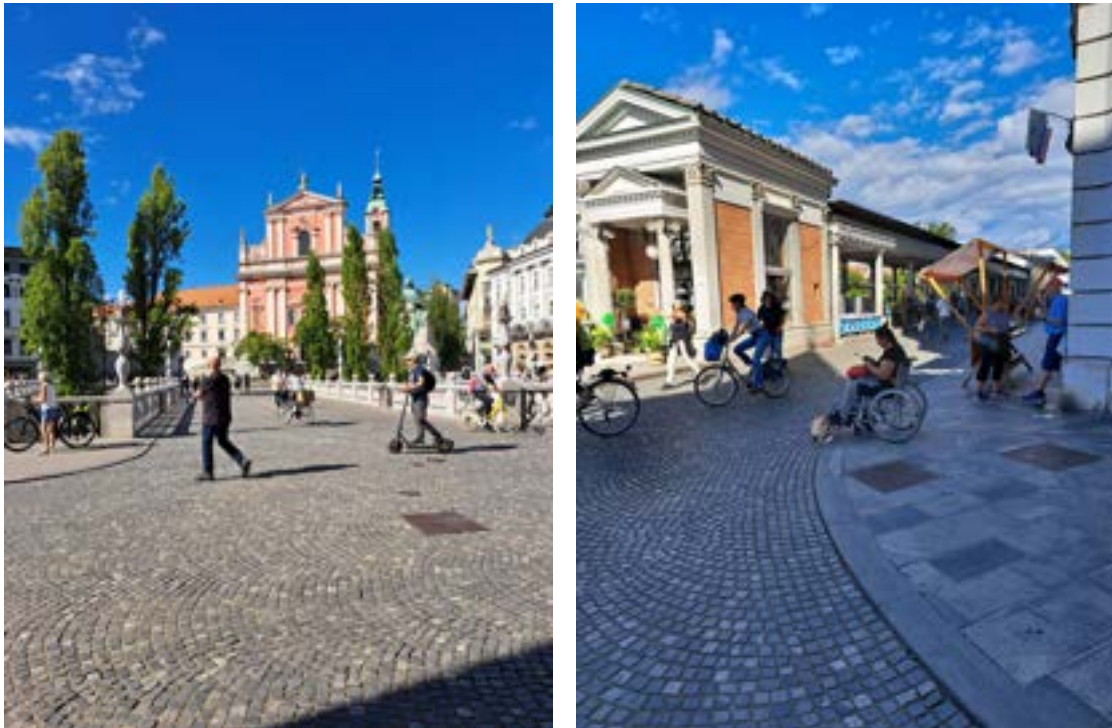
Amendments to the Decree on the categorisation of municipal roads in the City of Ljubljana

Several new constructions, reconstructions and traffic modifications have been carried out since 2008. Some sections of road are no longer open to public traffic, and the current Decree on the categorisation of municipal roads (published in 2005 and amended in 2008) has had to be amended. For this reason, the City of Ljubljana has launched a new categorisation of municipal roads and paths which includes facilities for cyclists.



(Source: Cycling Account, 2022)

1.3 The conditions of micromobility in Ljubljana



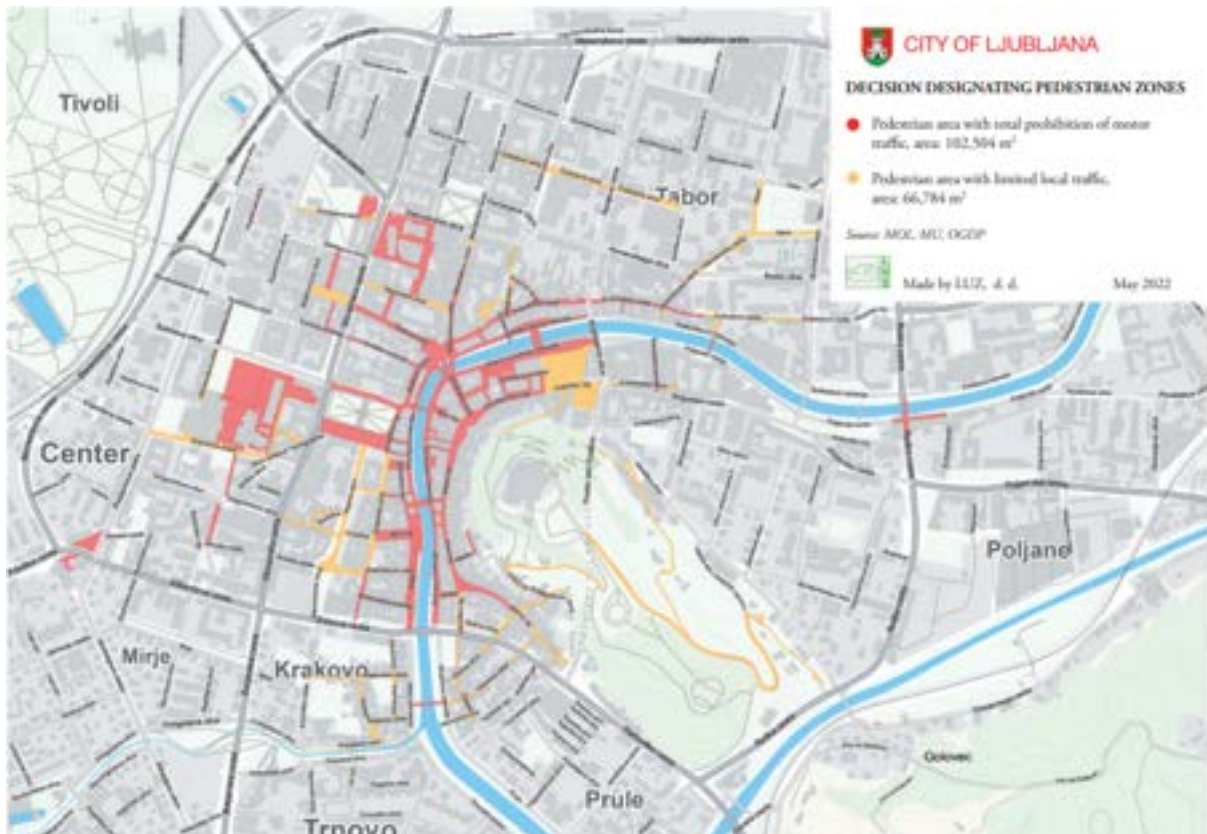
*Co-existence of micromobility users in Ljubljana pedestrian zone.
Left: The Triple Bridge (photo LKM) ; Right: Plečnik Marketplace (photo LKM)*

Ljubljana is one of the smallest yet one of the forward-thinking capitals in Europe when it comes to creating livable spaces for people. The city centre has a pedestrian area of which 102,504 m² is completely free of motor vehicles and another 66,784 m² is restricted to local traffic. **In a total of 12 hectares, motorised traffic is restricted and micromobility is allowed (delivery vehicles are allowed between 6am and 10am - for vehicles with permits).**



Pedestrian zone in the centre of Ljubljana. Since 2007 the pedestrian zone in the city centre has been increased by 620% (photo LKM).

Ljubljana's pedestrian zone (figure below)



(Source: Cycling Account, 2022)

The co-existence of cyclists and pedestrians (and other micromobility users) is based on mutual acceptance and consideration and is considered to work well. Signposting at critical points (figures below) reminds cyclists to consider the safety of pedestrians. Cyclists are allowed to ride in the pedestrian zone in the city centre where they have to give the right of way to pedestrians and should not put them in danger when cycling.



Sign with a reminder of the pedestrian priority in the pedestrian zone and information about the hours for the delivery (photo LKM).



Entrance to the pedestrian zone in the centre of Ljubljana reminding the cyclists about the pedestrian priority in the pedestrian area (photo LKM).



Banks of Ljubljanica and micromobility users (photo LKM)

A **shared traffic space** is established across the streets of Slovenska cesta, Poljanska cesta and Rakovniška ulica.



Left: Poljanska Street shared space (photo Micromobi partners); Right: Slovenska Street shared space, where the coexistence of micromobility users and public buses is challenged on a daily basis (photo Micromobi partners).

Ljubljana is a cycling city: quick and cheap mobility in the wider city centre

The most efficient way to discover Ljubljana as well as a nice and the quickest way to move is **by bicycle** as it is flat and compact enough to move around the city easily by pushing pedals.

The city has a long tradition of cycling, dating before the 2nd World War and it is considered a cycling friendly city with a cycling network of more than 300 km. **The latest analysis of Ljubljana's cyclists' association LKM, made in 2024, estimates Ljubljana has 317 km of cycling network** (figure below).

In 2015, Ljubljana first made it onto the list of top **20 bicycle friendly cities in the world** taking the 13th place, and in 2017 it improved its ranking. It made it as high as the 8th place on the »Copenhagenize Bicycle Friendly Cities Index 2017«. (City of Ljubljana)

In addition to numerous infrastructural improvements and other measures, the popular **bicycle-rental system BicikeLJ (2011)** has also contributed to the rise of cycling in the city.

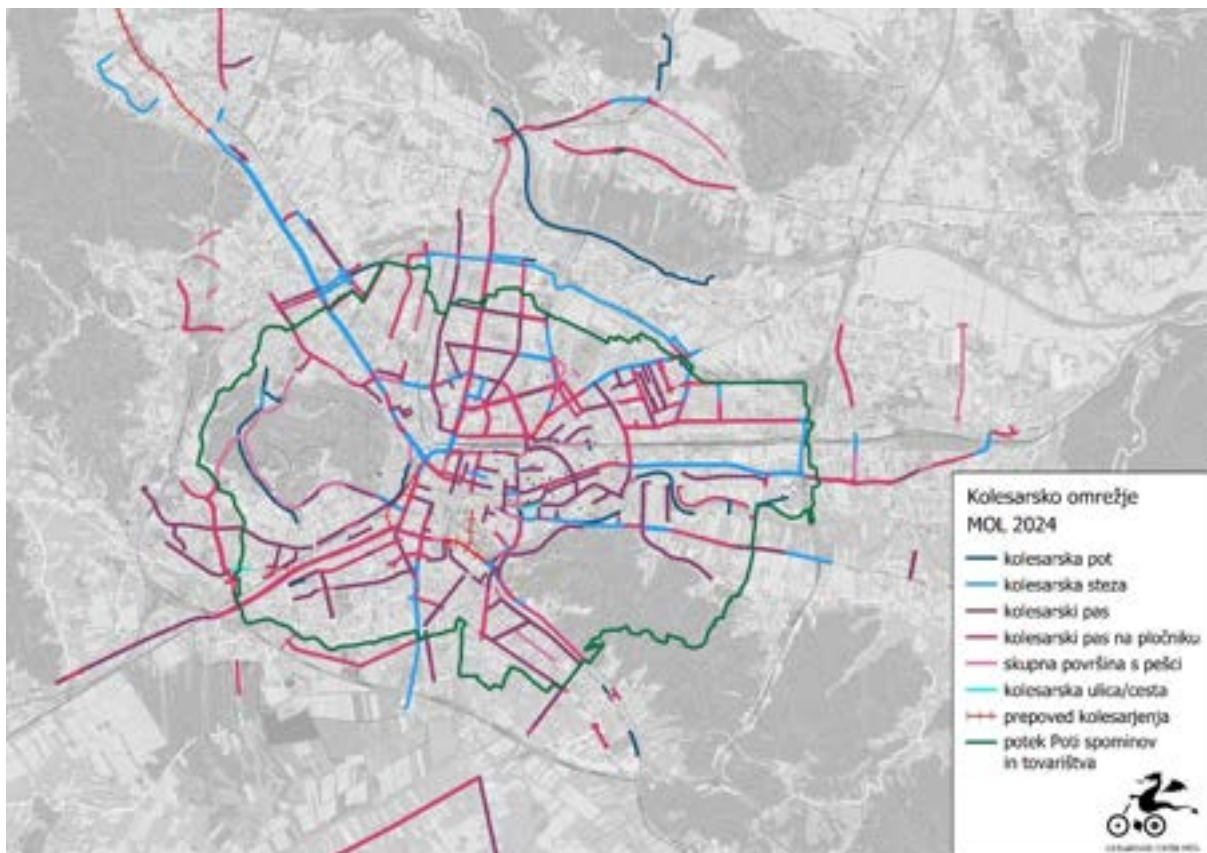


Examples of comfortable and segregated cycling infrastructure in Tivoli Park (photo LKM)



BicikeLJ (photos Micromobi partners)

Ljubljana cycling network in 2024 (figure below)



(Source : Analysis of Ljubljana cycling network, LKM, 2024)

According to information from the LKM, there is no complete and up-to-date survey of all cycling surfaces in Ljubljana. With the help of field work and a review of data from the Municipality of Ljubljana, data from Open Street Map and Google Maps, LKM digitised the entire bicycle network in the municipality. The largest share is represented by bicycle lanes on the sidewalk, followed by bicycle lanes (on the carriageway). There are still almost 8 km of roads where cycling is prohibited.

Compared to 2020, the network in 2024 has increased by 18%, especially because of painted/marked bicycle lanes on the carriageway. These have been introduced also on the streets where the speed limitation exceeds 30 km/h. Inside the highway ring, the cycling network is quite branched. While outside of it, there are quite a few unconnected sections of cycling surfaces. In addition, even within the ring, there are quite a few areas where the cycling network is either interrupted or the existing network is inadequate - mostly due to outdated infrastructure.

Fact and figures of micromobility conditions in Ljubljana

- Established **contraflow** (figure below) for almost 28 km - **cycling is possible in the opposite direction of motorised traffic, on 123 one-way streets**



Left: sign to exempt cyclists from one-way street no entry rule (photo LKM) ; Right: example of sharrows on a residential road to indicate shared road space (photo Micromobi partners)

- There is a **shared carriageway for motor vehicles and cyclists on more than 20 streets**, totalling approximately 8 km. It is named **sharrow - shared lane for motorised traffic and cyclists** (figure above), used where there is a 30 km/h speed limit.

- **About 10 km of cycle lanes are marked on roads without a centre line**, on twelve streets in total, **with a painted cycling lane** (figure below), unfortunately also on some busier roads, where the speed limit exceeds 30 km/h.



Left: marked cycle lanes on the road (photo LKM) ; Right: bicycle parking racks (photo LKM)

- In 2021 and 2022, the Slovenian capital installed **286 bicycle racks** (figure above) to provide safe parking facilities for about 600 bicycles, **adding to the already available 10,000 bicycle parking spaces.**

- **In 2022, the first underground public bicycle garage** (figure below) **was opened under Kongress square.** The entrance is not easily accessible and is shared with cars, so it is not bike friendly.

The underground public bicycle garage shares the same entrance with cars (a written sign says: beware of the bicycle)



Photo City of Ljubljana

- **Four thematic cycle routes are waymarked around the city** (see detailed description of Thematic cycling paths in “Examples of good micromobility practice in detail” below)
- **Ljubljana has two “Cycling Streets”** (Fietsstraat - originates from the Dutch cycling infrastructure) since 2022 and 2023, where cyclists have priority and cars are guests and since then, the bicycle street is a new category of bicycle infrastructure surface. Motorised vehicles are not allowed to overtake cyclists and cycling side by side is allowed (which is not allowed anywhere else). It’s very good that Ljubljana got its first two cycling streets, but the implementation lacks more traffic calming measures that actually slow down cars and instruct them visually.



Examples of cycling streets in Ljubljana (photos Micromobi partners)



Signposting in a cycling street in Vič district (photos Micromobi partners)

- Bike sharing proved key to normalising a cycling culture in Ljubljana. The **city's public bike sharing system, BicikeLJ, was introduced in 2011**. Since then, BicikeLJ has progressed towards becoming one of Europe's most successful bike sharing programmes with 17% of Ljubljana's residents having an annual subscription (see detailed description below).
- As of 2022 the city has an e-bike sharing system (Nomago) and as of 2023, multiple e-kickscooter sharing systems (offered by private providers). E-kick scooters are allowed to be driven on the bicycle lanes at maximum speed of 25 km/h. Children from 14 years onwards and with a cycling exam, are officially allowed to ride them. The same as for bicycle use, a helmet is obligatory up to 18 years of age.



Left: electric bikesharing system (photo Micromobi partners) ; Right: electric shared kickscooters parked in a dedicated parking spot (photo LKM)

- Public transport is free of charge for residents of Ljubljana over 65 years of age.
- Small electric vehicles are operating in the city centre upon immediate request for shorter trips, free of charge for both residents and visitors.
- An increasing number of public areas, and also city buses, are adapted for persons with reduced micromobility. For better mobility options, they can access the **Ljubljana by Wheelchair mobile App**.

Examples of good micromobility practice in detail

BicikeLJ (public bike sharing rental system)



BicikeLJ public bike sharing system in Ljubljana (photos LKM)

BicikeLJ (2011) is a public-private partnership between the City of Ljubljana and Europlakat d.o.o. The first hour of use is free of charge, which has been very well received among users since 98 percent of all users' journeys are free. The yearly subscription costs 3 € for an unlimited number of trips with the 60 minutes of each trip free of charge. The weekly subscription with the same conditions is 1€.

Initially, there were 300 bicycles at 30 stations available to users. The popularity of the system has exceeded all expectations, therefore the station and bicycle network are consistently growing. Now there are already 840 bicycles at 84 stations available to users. At the end of April 2022, Bicikelj bikes had been rented more than 9.1 million times since its launch in May 2011. The average rental time was 16 minutes with each bike being used an average of 8 times a day (City of Ljubljana, Transport in Ljubljana).

Bike boxes

Bike boxes are being introduced in line with the guidelines of the Sustainable Urban Mobility Plan of the City of Ljubljana enabling cyclists to move in front of motor vehicles at intersections. The bike box increases cyclists' safety as it alleviates a critical point - the danger from vehicles turning right at an intersection.



Left: Bike boxes where cyclists can wait to cross the street in front of cars with the bike box sign. (Photo City of Ljubljana: Vita Kontić) ; Right: Bike box (photo LKM)

Cycling counters



Left: Cycling counter in Tržaška; Right: Cycling counter in Celovška Street (Photos Micromobi partners)

In 2015, four cycling counters measuring cyclists going to the city centre (Tržaška, Šmartinska, Roška, Celovška) were installed, which display the number of cyclists passing them. The measure has turned out to have a positive effect on the promotion of urban

cycling.

Regular cycling measurements with automatic traffic counters are carried out by the city at four locations (in both directions): along Drenikova, Celovška, Dunajska and Kajuhova cesta. More than 3 million cyclists ride past these points every year (see figure below).(City of Ljubljana, Transport in Ljubljana)

Data from cycling counters (Cycling Account 2022) figure below



(Source: Cycling Account, 2022)

Thematic cycling paths

The aim of thematic cycling paths is to set up attractive cycling paths between different parts of Ljubljana on less congested streets for daily journeys made by bicycles. At the same time these paths represent an extension of what Ljubljana has to offer to its visitors who can go on a bike-ride to experience Plečnik's architecture, the beauty of the Ljubljanica River or the green wedges of the city.

The first of the four thematic cycling paths, called **Waterside Path (12 kilometres) was marked in 2014.** It proceeds alongside Ljubljanica and intertwines the urban environment with nature. It goes from the Fužine Castle on the embankments of Ljubljanica through Štepanjsko district and Kodeljevo district, through the city centre (Petkovšek Embankment, Prešern Square, Congress Square and New Square) and ends at the Špica embankment.

In 2015 the idea expanded to include the **Plečnik Path (14 km)**, which connects Plečnik's heritage in Trnovo, Žale and Tivoli, and the **Forest Path (7 km)** around the foot of Rožnik Hill connecting Tivoli Park with Mostec Park.

The fourth path, which has been popular among cyclists for a long time, is the **gravel path around Ljubljana**, lined with trees, namely, the **Path of Remembrance and Comradeship (32 km)** (City of Ljubljana, Transport in Ljubljana).



Along two of the thematic cycling routes (Photo Micromobi partners)



Bicycle parks, service stations and an information point

A service station for minor bicycle repairs and for inflating tires is set-up in front of the Tourism Ljubljana information point at *Krekov trg* in the centre of the city.

With the construction of the **bicycle park KoloPark in Šiška**, the once degraded area along Celovška cesta has been turned into a recreational surface. Within the park, there is a self-service bike shop, where users can inflate tires, change a tire with the keys provided, and perform smaller service works on their bikes with other tools in order to improve mobility and safety.

At the intersection of the streets Linhartova and Topniška cesta, the new **bicycle park KoloPark Bežigrad** was arranged within the European Mobility week 2017. Like KoloPark Šiška it also offers free-of-charge fun and practice with all kinds of self-propelled vehicles, from bikes, kick scooters, skateboards, inline skates, to roller skates and foot-propelled bikes.

In 2016 the first construction phase of the **Bike Park Ljubljana** was concluded and the new part of the park was open next to the final stop of the number 5 city bus at the end of the **Podutik**. A dirt road connects both parts of the park and in the third phase a singletrack is planned to be set up between the two sites, as well as numerous additional trails.

In cooperation with the **cycling association Rajd**, the **information point** of the European Green Capital 2016, which was located in front of the City Hall, **has been moved to Podutik to be used for the operation of the Bike Park Ljubljana**. To serve as a **point of departure for road and mountain bikers** in the area of the Polhov Gradec Hills.

In 2018 the **largest bicycle park in Slovenia, KoloPark Fužine** was arranged.

In 2022, **a new bike park along the street Cesta v Gorice was opened**. It is set up right next to the residential neighbourhood of the City of Ljubljana Public Housing Fund, also at the initiative of many residents and locals (City of Ljubljana, Transport in Ljubljana).

There are currently 7 KoloParks (the most recent newly opened is placed near the primary school in district Polje).



Left: One of the bike parks (Photo Micromobi partners) ; Right: A bike repair service station (Photo Micromobi partners)

Kavalir, Klinko (2009, 2021) electric vehicles

In order to help residents with reduced mobility face the challenges of the large-scale pedestrianisation of the inner city, Ljubljana installed the free-of-charge “Kavalir” service. In the pedestrian zone in the city centre, residents and visitors alike can use those **electric vehicles for free** throughout the year.

The public company *Ljubljanski potniški promet* introduced the first two vehicles in 2009, as part of the European initiative CIVITAS ELAN and thus implemented the “demand-responsive transport service”, initially as a test.

In **2017**, the *Ljubljanski potniški promet* fleet already featured a total of **eight such vehicles**. Due to the vehicles’ low speed, they would easily stop when hailed by potential riders. The friendly drivers would also gladly respond to requests for a ride by phone. Up to five passengers at once can use a free ride. The vehicles do not follow predefined routes and stops, but rather operate on-demand according to the passengers’ request. **By the end of 2017, the Kavalir vehicles had transported more than 1.2 million passengers.**

The name Kavalir (meaning a cavalier, a gentleman) was chosen according to its noble function: the service offers free-of-charge rides in the city centre to all, especially to persons with reduced mobility, and their drivers are known for their friendliness and courtliness (City of Ljubljana, Transport in Ljubljana).

In **2021 Klinko**, a very similar concept as Kavalir, was introduced as part of the project in cooperation with public hospitals in the centre of Ljubljana which offers free rides specifically to visitors and users of public hospitals.



Kavalir electric vehicles available for free public use in the pedestrian area (Photo LKM)

P+R facilities

The P+R system (**P+R stands for Park and Ride**) is a combination of private and public transportation, which allows users to reach the main points on the city outskirts or the radial roads with their cars and continue their journey to the city by bus or a bicycle from the BicikeLJ bike-sharing system. **By paying one regular parking fee, the P+R system users are entitled to two bus rides until midnight on the same day.** This way, the number of cars in the city centre is reduced.

In Ljubljana, there are six P+R facilities that operate within the P+R system.

In cooperation with the neighbouring municipalities, the Ljubljana smart city card payments are also possible at three other P+R facilities. (City of Ljubljana, Transport in Ljubljana)



P+R facility in Dolgi most, Ljubljana, together with e bike and e scooter rentals. (Photo Micromobi partners)

Urbana – Smart Single City Card

In 2009, Ljubljana introduced Urbana, **a contactless card for the payment of fares on Ljubljanski potniški promet buses that allows riding and transfers within a 90-minute period.** Urbana was first introduced on lines within the city and later also on integrated and intercity lines.

Ljubljana is one of the first cities in Europe to introduce uniform payments for city services.

With Urbana, users can also pay for rides with e- vehicle EURBAN, the funicular to Ljubljana Castle and tickets to all Ljubljana Castle events, parking fees at public parking spaces and P+R facilities, Ljubljana City Library services, as well as use it for renting bicycles in the BicikeLJ bike-sharing system. Urbana is used for public transport by an average of 560,000 users annually. Already in 2009, paying with the Moneta technology was introduced on buses (for rides without changing buses), however from 2014 on, users with smartphones with Android 5.0 or higher can install the mobile app Urbana, offering everything that the Urbana card offers.

In the future, the Urbana card will also enable payment of entrance fees for museums, sports institutions and cultural events (City of Ljubljana, Transport in Ljubljana).



Photo LKM

1.4 The lessons learned

Ljubljana's city centre is the largest car free zone in Slovenia and has been internationally recognized as a best practice in terms of sustainable mobility, urban planning, space reallocation, and environmental protection. In 2022, the Slovenian capital celebrated its 15th anniversary since the start of the gradual closing of the city centre for motorised vehicles. With many complementary sustainable measures and projects implemented, Ljubljana sets a good example of how to overcome car dominance and turn the city into a pleasant "living room". **Since 2007 the pedestrian zone in the city centre has been increased by 620%.** The change to the city centre has been well accepted among citizens and brought significant improvements to air quality and noise reduction: the local black carbon pollution in this area has decreased by 70% and noise has decreased by 6dB compared to before the establishment of the eco-zone.

Since 2007, through several reconstructions and urban redevelopment projects, the city centre has gained many new public areas dedicated to micromobility, more green spaces, revitalised riverbanks, new bridges, and refurbished squares, which are closed to motorised traffic. The central public space has been enriched by activities that encourage socialisation and economy and provide space for social interaction, cultural, sports, and entertainment events. The car free zone in the city centre has been gradually expanded over the years and improvements implemented with special consideration to pedestrians, cyclists, and users of public transport, as well as people with disabilities and other more vulnerable participants in traffic (elderly, children, parents with strollers).

Judging by opinion polls, the majority of residents are pleased with the changes – new spatial arrangements, embellishment, traffic regimes, decreased noise, improved air quality, etc. In 2007 only 40% of the population was in favour of closing the city centre for motorised traffic. Ten years later, 97% of citizens were against the reopening of the centre to motorised traffic. In addition to the huge motorised traffic free zone, residents can enjoy the green spaces that cover three quarters of the city's surface. All of the measures improved the quality of life for the inhabitants of Ljubljana. **According to the SUMP mobility survey, 95% of inhabitants see the changes as positive.**

With the use of other micromobility devices, especially e-kickscooters in recent years and the growth in the number of cyclists in the city, which was sparked by the coronavirus pandemic, the statistics on accidents and deaths of vulnerable road users are rising. Thus, there is a need for more education and training of vulnerable road users also in Ljubljana on safe movement, road code and safety rules as well as a growing need to educate other drivers, journalists, public officials and the general public. Ljubljana sets an example also for other cities in Slovenia in terms of being successful in changing its infrastructure, habits and quality of life through sustainable practices.

Many professionals and micromobility users feel that not enough has been done since 2015 and fear the trend of severely polluted air (due to high emissions from road traffic and heating, especially alarming in winter because of the Ljubljana geographical position in the basin), growing number of individual cars, congestions on the roads, planned expansion of the lanes for motorised traffic. As well as the crises and inefficiency of public transport - city buses and Slovenian railways. There is a fear of loss of green protected areas - parks and forests, and other public (green) areas due to commercialisation.



Traffic congestion in the main traffic axis, Slovenska Street. (Photo LKM)



Standing line of buses/traffic congestion on Slovenska Street shared space (photo LKM)

Ljubljana has made progress in terms of cycling infrastructure in the last decade. The city boasts a big cycling network and a relatively high share of journeys made by bicycle (11% modal split for 2013, while data from 2024 have not yet been made public) as well as high rankings of bicycle-friendly cities (14th place on Copenhagenize Index in 2019).

However, the "Bicycle Cities Index" (2022) is probably more realistic, which defines bicycle-friendly cities according to six categories, including, of course, bicycle infrastructure. According to this ranking, Ljubljana ranks 43rd out of 90 cities.

Indeed, **Ljubljana does not belong to the so-called beginner cycling cities, but it certainly does not belong to the more advanced cities for cyclists, such as cities in the Netherlands, Denmark, Sweden, Germany, Belgium, etc. Those cities, in addition to a more extensive, comfortable and connected cycling infrastructure or networks, also implement much better measures for multimodality (e.g. by train), bicycle parking and of course implement more sustainable traffic policies such as calming of motorised traffic, zero emission zones, 30 km/h speed limit as much as possible and in all residential areas.** These measures benefit all micromobility users, the environment and climate, decrease air and noise pollution and increase traffic safety of all people, besides health benefits.



Marked bicycle lanes on the carriageway where the speed limitation exceeds 30 km/h (Photo LKM)

Ljubljana should introduce a public cargo bike sharing system as well as a reduced mobility adapted bike rental scheme. Such services are now lacking and are needed, also for the delivery purposes of businesses. Too often, delivery lorries block the pavements and especially cycling lanes. The problem and a bad practice is also that the environmental and social cost of the BicikeLJ public-private rental system is high. The Europlakat digital marketing displays are numerous and placed in the public space, in some cases even on pavement and cycling surfaces. Each display uses great deal of power. Besides, there is significant light pollution as well (the practice of keeping the displays active during the night).



Left: Delivery vehicle blocks the pavement and cycling surface (photo LKM); Right: Europlakat digital marketing display (photo Micromobi partners)



Europlakat display on the pavement (photo Matej Praprotnik)

Bad practice in terms of cycling infrastructure

Note: Infrastructure and conditions are constantly changing, so this is an overview of the situation in summer/fall 2024.

Traffic light intervals inappropriate for cyclists (figures below)

The traffic light intervals are most often made in such a way that they offer much more time to motorised traffic. Examples of good practice appeared years ago, a 3-second green pre-phases for cyclists to be the first to cross the intersection (e.g. the intersection of Roška and Poljanska), but unfortunately City of Ljubljana did not continue with the introduction of such solutions (despite the fact that this was written in the Transport Strategy).



Examples of crossing with traffic light intervals too long/inappropriate for cyclists (photo LKM).

Cycling surface beside car parking places (figure below)

Unfortunately there are quite a solid number of painted cycling lanes and streets with “sharrow” signs on streets which are situated beside parked cars. This can be very dangerous for cyclists.



Photo LKM

Placement of the cyclists on the pavement (figure below)

As to separate them from motor traffic - cyclists often encounter obstacles such as ramps, manholes, curbs, stakes, urban equipment, etc. Almost half of Ljubljana's cycling infrastructure is situated on the pavement, together with the pedestrians. It creates conflict with the pedestrians and many times that results in cyclists driving on the road, which is dangerous.

This practice is a relatively cheap way to popularise cycling, but Ljubljana with its history of cycling could and should do better in terms of cycling infrastructure.



Examples of the cycling surface on the pavement (photos LKM)



Bumps segregating the pedestrian and cyclists' surface (photo LKM)

Sudden network interruptions(figure below)

When the cycling surface simply ends on the road, it can be very dangerous. Unfortunately there are such cases in Ljubljana.



Photo LKM

Green arrows for motorised vehicles at intersections(figure below)

In 2022, the City of Ljubljana started introducing the dangerous practice of green arrows, which allow motorised vehicle drivers to turn right at a red light also in many cases where there is also a school street.



Photo LKM

Uncomfortable and dangerous cycling surfaces (figure below)

Curbs/edges that do not allow smooth driving, excessive ramps and indirect guidance through sharp turns are disturbing, and all of this is also dangerous. It is also important to point out the relatively poor maintenance of the existing infrastructure, even on the main bicycle ramps, where comfort is further impeded by pegs and other traps for cyclists, such as metal bollards or bumps to separate cyclists from pedestrians.



Photo LKM

(Too) Narrow cycling surfaces (figure below)

There are few sufficiently wide bicycle surfaces in Ljubljana that allow overtaking and safe cycling. Too often they are made according to the prescribed minimum standard of 1 m, which is not enough for even one "non-standard" bicycle, such as cargo bicycles, bicycles with trailers, tricycles, bicycles adapted for the physically challenged, etc. In addition, comfort is also negatively affected by frequent changes in the type of cycling infrastructure, for example from track to road and back.

From the point of view of comfortable cycling infrastructure, the best cycling paths in Ljubljana are still those from the late 60s of the 20th century, which were created under the influence of Danish urban planners. They are wide, separated from motor traffic and pedestrian surface, properly routed at intersections and with plenty of greenery along the paths (southern part of Dunajska street and southern part of Celovška).



Photo LKM

Intermodal connections with the public transport network (figure below)

The bicycle works perfectly in combination with the train, **but many railway stations in Ljubljana are not very accessible by bicycle.** In this area, further improvements are expected within the framework of the Ljubljana Passenger Centre project and related improvements to the ring roads.



The main (Central) railway station in Ljubljana (photo LKM)

Poor connection between some of the functional parts of the city and with other municipalities nearby

The cycling network in Ljubljana is not modest, but just by looking at the cycling map, it is clear that there are still a lot of holes in the Ljubljana network. In addition to the connection between the functional parts of the city, the connection with other settlements is also very important, especially in the light of more than 120.000 commuters pouring into the city every day. The regional cycling connections are lacking. A public e-bike sharing system connecting the neighbouring municipalities and the city of Ljubljana was introduced in 2024.

References

City of Ljubljana. Transport and mobility.

<https://www.ljubljana.si/en/ljubljana-for-you/transport-in-ljubljana/>

City of Ljubljana, 2022. Cycling Account 2020/2021.

<https://www.ljubljana.si/assets/Uploads/Kolesarski-letopis-2022-Eng-Web.pdf>

Ljubljana Cycling Network, 2024. Analysis of the Cycling Network in Ljubljana.

EU Commission, 2020. EU Urban Mobility Observatory, 2020. Pedestrianisation of Ljubljana city centre, 2020.

https://urban-mobility-observatory.transport.ec.europa.eu/resources/case-studies/pedestrianisation-ljubljana-city-centre_en

Civitas Elan project, 2008-2012.

<https://civitas.eu/cities/ljubljana>

<https://www.slovenia.info/en/places-to-go/regions/ljubljana-central-slovenia/ljubljana>