



Regionalna razvojna agencija LUR

ANALIZA STANJA IN PREDLOGI UKREPOV
RAZVOJA JAVNEGA PREVOZA IN INTERMODALNOSTI NA
PILOTNEM KORIDORJU
LETALIŠČE JOŽETA PUČNIKA LJUBLJANA-
LJUBLJANA-KOPER

ANALYSIS AND MEASURES FOR
DEVELOPMENT OF PUBLIC TRANSPORT AND INTERMODALITY
ON THE PILOT CORRIDOR
AIRPORT JOŽE PUČNIK LJUBLJANA- LJUBLJANA-KOPER

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1 INTRODUCTION

Regional development agency of Ljubljana urban region (Regionalna razvojna agencija Ljubljanske urbane regije, shortened RRA LUR) participates in the Inter-Connect project as the only Slovenian partner. The project is co-financed by the European Regional Development Fund within the Interreg Adrion program.

Inter-Connect project deals with improving the accessibility of the countries within the Adriatic-Ionian macro region. Main purpose is to encourage the participation of key stakeholders at all levels (local, national, international) in formulating and implementing a common strategy for the development of alternatives to the private road passenger transport notably public road and rail transport as well as maritime and air transport in purpose of promoting sustainable daily commuting and tourism.

RRA LUR activities within the Inter-Connect project focus on the analysis of current situation and the development of inter-modality between different transport systems (bus, railway, maritime and air transport) with the aim of developing sustainable tourism in the area between coastal towns and the Ljubljana Urban Region and beyond.

The main purpose of the study is to make an analysis of current state of public transport and inter-modality in the pilot region and to present the necessary measures that could improve the conditions for use of the public transport especially for tourists between the Slovenian coast, the Ljubljana Urban Region and the Ljubljana Jože Pučnik Airport. The study results are basis for further decisions of the RRA LUR, in cooperation with the contractor and other stakeholders, which shows potential pilot actions to improve the conditions of public transport will be carried out in further parts of the Inter-Connect project and basis for the creation of an inter-modality development strategy in the area of the Adriatic-Ionian macro-region.

2 DESCRIPTION OF THE PILOT AREA AND STAKEHOLDERS

2.1 Basic characterisation of transport infrastructure and services, settlement scheme and travel behaviour in pilot area

For this project, the pilot area includes corridor from most important tourists attractions in the Upper Carniola and the Ljubljana Jože Pučnik Airport located in Brnik to the city of Ljubljana and coastal area with the centre in the city of Koper. The project area includes four regional territories of Slovenia, Upper Carniola with the urban centre Kranj, Central Slovenia with the urban centre and largest city Ljubljana, Littoral-Inner Carniola with urban centre Postojna and Coastal-Karst with urban centre Koper. The purple line in the figure below demonstrate the pilot area.



Figure 1: Demonstration of pilot area and urban centres in observed corridor. (Source: Maps Wikimedia)

Geographical characteristics and historical circumstances defines the region of Slovenia as a transit area. The network of rail and road infrastructure, which is functionally connected to the European transport system, is developed and harmonised with the network of cities, towns and other settlements in region. As it is shown in the figure below, Slovenia is being integrated into the European infrastructure network corridors, which are implemented within the V and X pan-European corridors, Trans-European Energy network (TEN-E) corridor, maritime transport corridor with transverse transport links between transport corridors and links to the Adriatic-Ionian Initiative. Corridor V crosses the country in direction southwest – northeast linking Barcelona and Kiev, included in Mediterranean and Baltic-Adriatic corridors, and corridor X crosses the country in direction northeast-southwest from Salzburg to Thessalonica. The crossroads of the corridors V and X intersect in the capital Ljubljana.



Figure 2: International infrastructure corridors in Slovenia. (Source: Spatial Development Strategy of Slovenia)

Transport network in pilot area consists of road and rail infrastructure connecting main passengers and logistics transport hubs. Road network is well developed and considered to be nexus of road transport from outskirts to regional centres. The density of motorways in Slovenia is higher than EU-28 average. Despite improving motorway network, the region suffers from traffic congestion especially in peak hours, particularly in Ljubljana region. As railway service is regaining its importance in region, infrastructure modernization of the corridors is one of national priorities. Many of railways have been modernized and high-speed intercity service has been introduced, however much of the systems track remains limited in performance of the equipment. The railway network included in pilot area enable passenger and freight service between Adriatic sea and the main cities of regional importance.

The road and railway infrastructure in Slovenia is state-owned and treated as a public good. The infrastructure is operated by public companies or authorities which has a contract for the maintenance and management with the Republic of Slovenia. Motorways and expressways are operated by the company DARS, main roads and regional roads are operated by the DRSI, local roads and public paths are operated by local communities and railways are operated by the company Slovenian Railways. There are three major international transport hubs located in the pilot area, the Ljubljana central station, the Port of Koper and the Ljubljana Jože Pučnik Airport.

The Ljubljana central station is most important hub in region for bus and railway on regional and international level. It is located in the centre of the capital Ljubljana.

The largest and most important maritime transport hub is the Port of Koper. It represents one of the key entry and exit ports at the southern gateway to international commercial links between Europe and overseas. It lies on the shortest transport route linking logistics and commercial centres in Central and Eastern Europe with Mediterranean countries. In accordance with the EU Maritime Transport Strategy the special attention is also intended to maritime transport development pillars on regional perspectives comprises connecting the region, ensuring environmental quality and blue growth. Specially in last period with the establishment of cruise terminal it gains importance from aspect of tourism as stop point for cruise vessels.

An equivalent level of concern should also be given to largest and most important international air transport hub in country, the Ljubljana Jože Pučnik Airport. It is connected to all important European destinations with regular and charter flights for passengers and cargo. The airport is in a process of continuous transformation, becoming an important regional distribution and logistics centre. It is located 25 km from the capital Ljubljana, what gives it vast opportunities for further development.

Public transport operators in project area provide service on local and regional level. The most important operator for rail public transport is Slovenian Railways – Passenger transport. Bus service is operated by operators Nomago, Arriva Alpetour, Arriva Dolenjska in Primorska and Ljubljana Passenger Transport. There are also several shuttle service operators available in project area connecting urban centres and most important points of interests.

Cities and other urban settlements cover the majority of the populated Slovenian territory. An urban system is based on an integrated network of urban settlements that ensure balanced development of the country and each of its individual regions. Urban centres of national and regional significance are integrated into an adaptable and well-organized polycentric network. In urban centres the most important public functions are gathered such as social infrastructure, supply activities, services and other activities. The pilot area with about a million inhabitants belongs to one of the highest populated area in the country. The cities included in area, Ljubljana, Kranj, Postojna and Koper, represent the centres of regional significance and are the most important economic areas and transport nodes in country.

Interaction of land use and transport results in predictable travel patterns and realised transport flows in transportation system. The population and infrastructure density is the highest in where jobs and other activities are concentrated. However the suburbanisation has occurred, enabled by high level of population motorisation. Therefore the trend of daily migrations has markedly increased in terms of the number of daily commuters and at the same time the areas of functional regions of major centres have increased too.

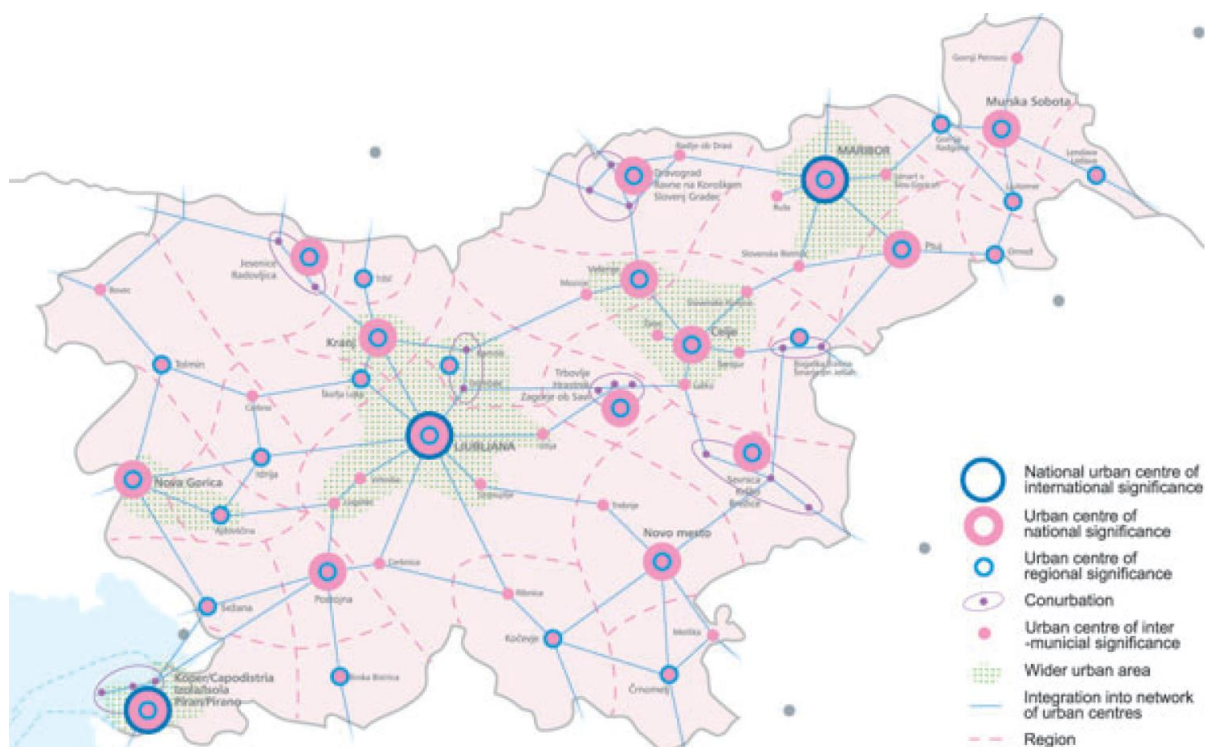


Figure 3: Urban centres of national and international significance with network connections. (Source: Spatial Development Strategy of Slovenia)

The dispersed development of low density settlements in the suburban is closely connected with patterns of daily migration based on car dependence, thus creating higher emissions of substances and noise into the environment and causing greater dependence on energy resources. Oppositely, ensuring efficient public transport system in compact urban areas represent a great advantage as well as many and various savings.

The rising trend of traffic flows in road transport is continuing. This increase is the result of suburbanisation and the distribution of job places. Additional journeys and traffic flows are also caused by movements of services, trade and business activities to city fringes. Motorway network construction, which enabled better mobility in Slovenia, thus also significantly increased the daily mobility of the work force, students and pupils and affected the construction of housing, since this is especially common in motorway cross directions. The increase in daily migrations away from large centres to nearby municipalities has also been observed, since some rural municipalities have managed to retain more jobs in those areas.

The highest share of daily migrations represent persons in employment working outside their region of residence. In Upper Carniola and Littoral-Inner Carniola regions there were over a quarter persons working in other statistical region in 2016. In Central Slovenian region there were daily 80.600 persons in employment coming to work in the region and 19.700 persons in employment going to work outside it in 2016. This statistical data shows strong dependence on the Central Slovenian region. Figure below shows travel demand between municipalities connected to urban centres in pilot area.

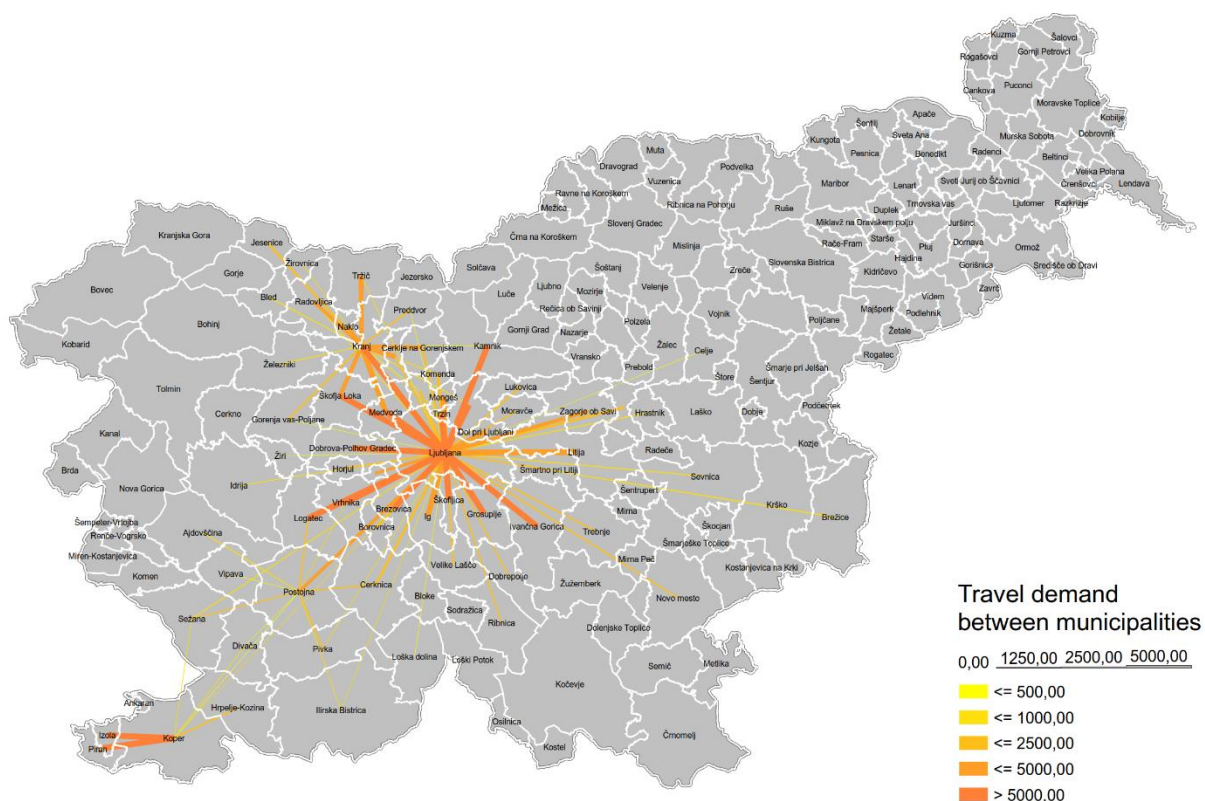


Figure 4: Travel demand between municipalities connected to urban centres in pilot area. (Source: PNZ)

The main data source of mode choice is the travel survey, carried out in 2016. The modal split data in study area is presented in table 1 below. The high percent of car use on daily level, especially for commuting, is a consequence of relatively uncompetitive public transport system condition what is proved on figures below showing car and public transport accessibilities of urban centres in study area.

More troubling than the current state of mode choice in Slovenia is the trend of change identified in the last two decades indicates an intense growth of car use on account of more sustainable ways using the public transportation system and non-motorized forms of traffic. The impacts of this trends are specially recognisable in the aspect of unsustainable spatial development of the region. The future projections for mode choice, concerning scenario of unchanged transport arrangement, are showing that no significantly change is expected. In according to the Transport development strategy of the Republic of Slovenia until 2030 the number of trips would increase approximately the same for all means of transport.

Table 1: Modal split in study area in 2016. (Source: PNZ)

	Upper Carniola	Central Slovenia	Littoral-Inner Carniola	Coastal-Karst	Slovenia
Car	80 %	74 %	85 %	78 %	80 %
PuT	8 %	8 %	9 %	3 %	5 %
Bike	2 %	5 %	0 %	2 %	3 %
Walk	11 %	13 %	6 %	17 %	12 %

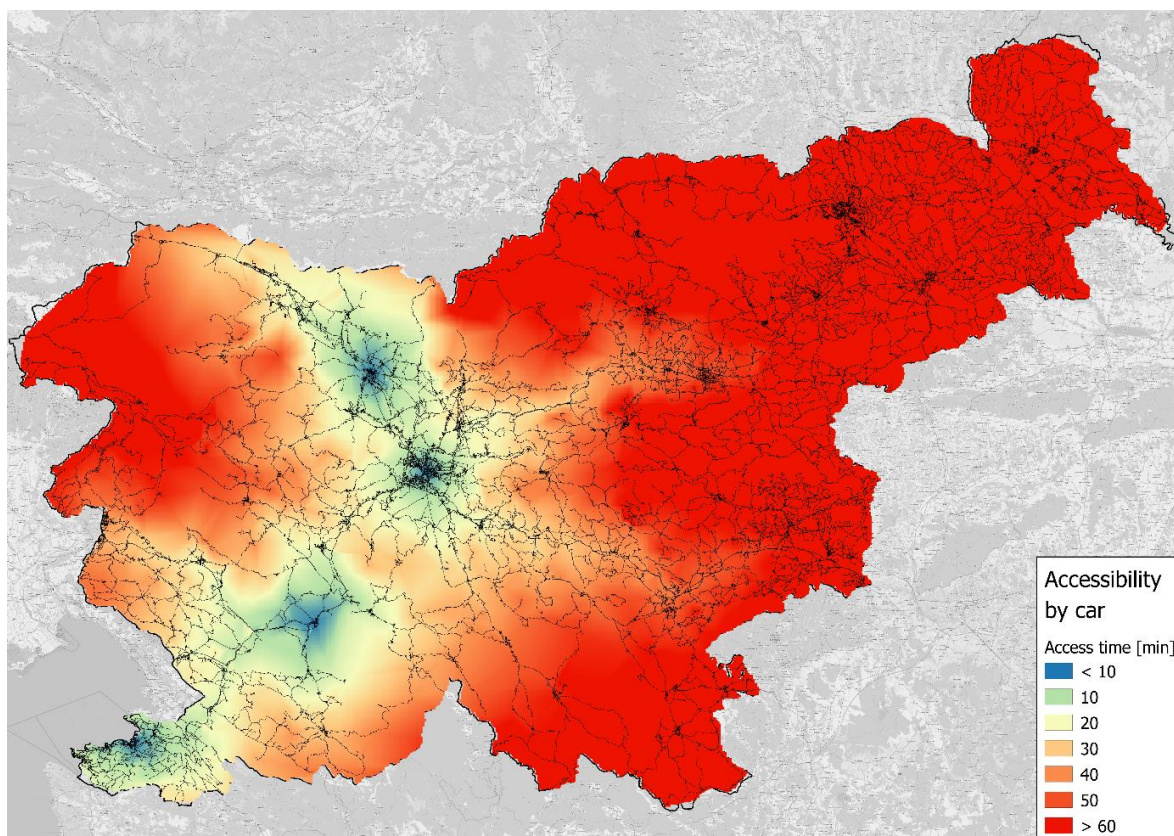


Figure 5: Private transport accessibility from urban centres in project area: Ljubljana, Kranj, Postojna, Koper.
(Source: PNZ)

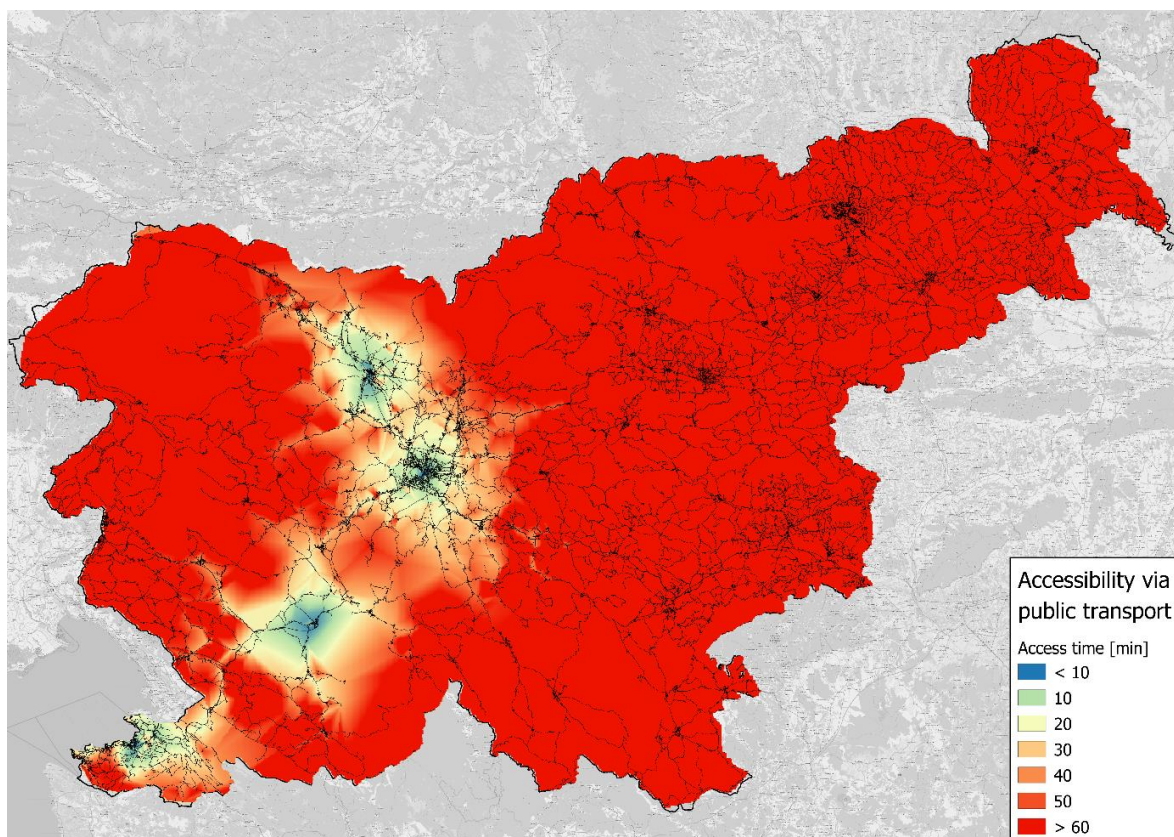


Figure 6: Public transport accessibility from urban centres in project area: Ljubljana, Kranj, Postojna, Koper.
(Source: PNZ)

2.2 Review of tourist points, tourist flows and tourism statistics in pilot area

Slovenia is from the aspect of tourism green and boutique destination offering experiences in exploring diversity of lifestyles of the Mediterranean, the Alps, or the Pannonian Plain in a small geographical area. It has become an important tourist attraction for demanding guests who are seeking a natural, geographic, architectural, and cultural experience. In the years to come and based present level of development of Slovenian tourism, it is expected to become one of the leading industries of the Slovenian economy and will thus make a significant contribution to the achievement of Slovenia's development goals.

Slovenia, with its diverse landscape, is a touristic attraction in itself. In the project area several important points of tourist attractions could be exposed. Starting at the Alpine Slovenia region Bled is most famous tourist destination of the Slovenian Alps. Next important tourist destination in Central Slovenian region is the capital city Ljubljana. Mediterranean Slovenia region entice visitors with the medieval coastal towns Koper, Izola, Piran and Portorož. Furthermore nearby coast there is Karst with Postojna cave, Škocjan caves and Lipica.

The tourist flow in pilot area is specially strong between previously mentioned points of interests. Furthermore tourist flows are also expected to be growing in years to come. By the statistical data from 2015, most of foreign tourists came to Slovenia by car (62%) or airplanes (24%). Other means of transport were buses (5%), campervans (4%), trains (2%), motorcycles (1%) and other (2%).

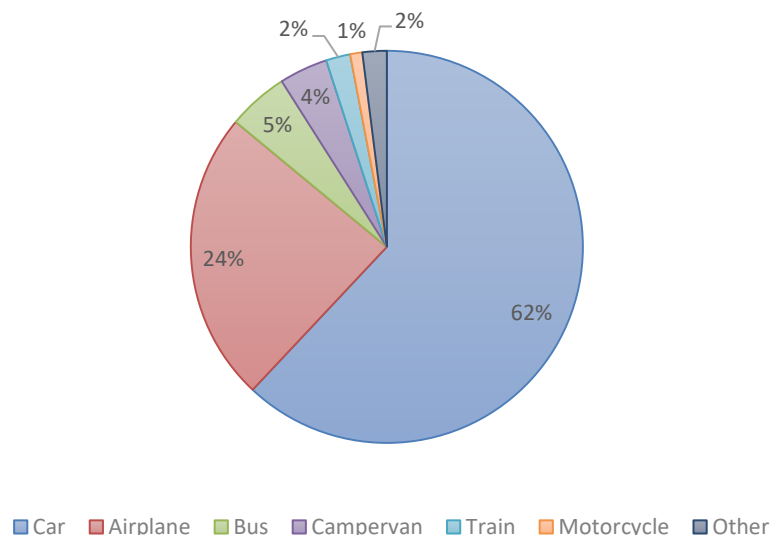


Figure 7: Modal split of tourist trips in Slovenia. (Source: SURS)

In 2016, 4.3 million tourist arrivals and 11.2 million tourist overnight stays were recorded in tourists accommodations. Furthermore in the last years growing trend in tourism has been recognized. By the statistical data in 2016, 26% more overnight stays and 43% more tourist arrivals were registered compared to 2010. Most tourists overnight stays in 2016 were recorded in the Mediterranean Slovenia region, almost 2.4 million, and in the Alpine Slovenia region, just over 2,2 million. Figure below shows

statistical data from 2016 of tourist overnight stays by statistical regions. It can be assumed that tourism has significant importance for study area.

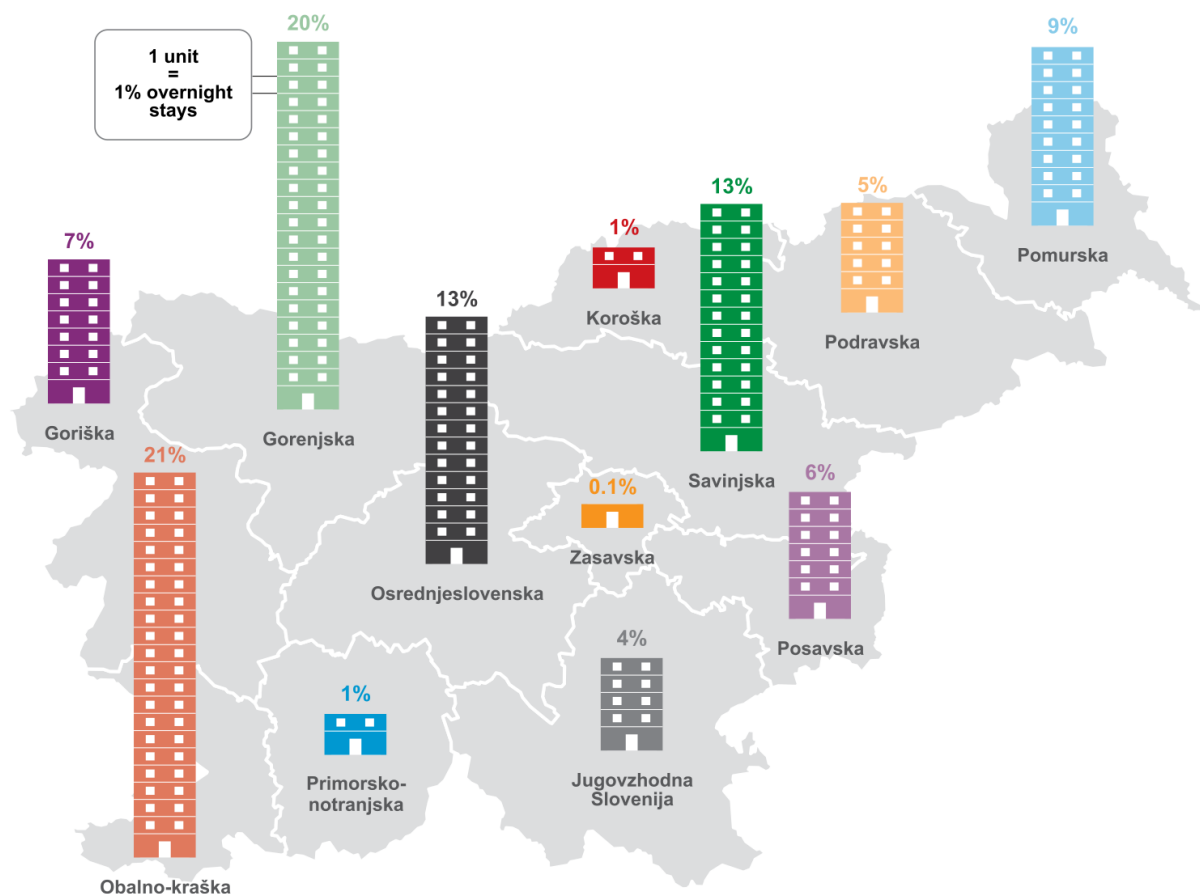


Figure 8: Tourist overnight stays by statistical regions, 2016. (Source: SURS)

From the touristic aspect figure 8 is showing that there are just a few overnight stays in the region where one of the most important tourist destination in pilot area, Postojna caves and castle, is located. As a consequence high level of generated trips from other regions is occurring. The demand for touristic trips has to be fulfilled by multimodal transport solutions, which are analysed in further chapters.

3 OVERVIEW OF TRANSPORT INFRASTRUCTURE AND SERVICES

3.1 Railway passenger infrastructure and services

Railway infrastructure comprises stable, artificially constructed facilities and devices intended for the efficient operation of rail transport. It consists of an entire network of railway lines with its upper and lower structure and associated facilities such as bridges, culverts, tunnels and viaducts, signalling and safety devices, power stations and train stations, stops, train assembly machines, marshalling yards, fuel supply and other devices intended for the preparation and maintenance of railway vehicles.

In Slovenia the railway infrastructure is state-owned and therefore treated as a public railway infrastructure. It is operated by the company Slovenske železnice – Infrastruktura, which is a contracted partner of the government of Slovenia for the maintenance and management of public railway infrastructure and for traffic management on it. The public railway infrastructure in Slovenia comprises the entire network of railway lines, including the mentioned facilities, with the exception of railway infrastructure at terminals.

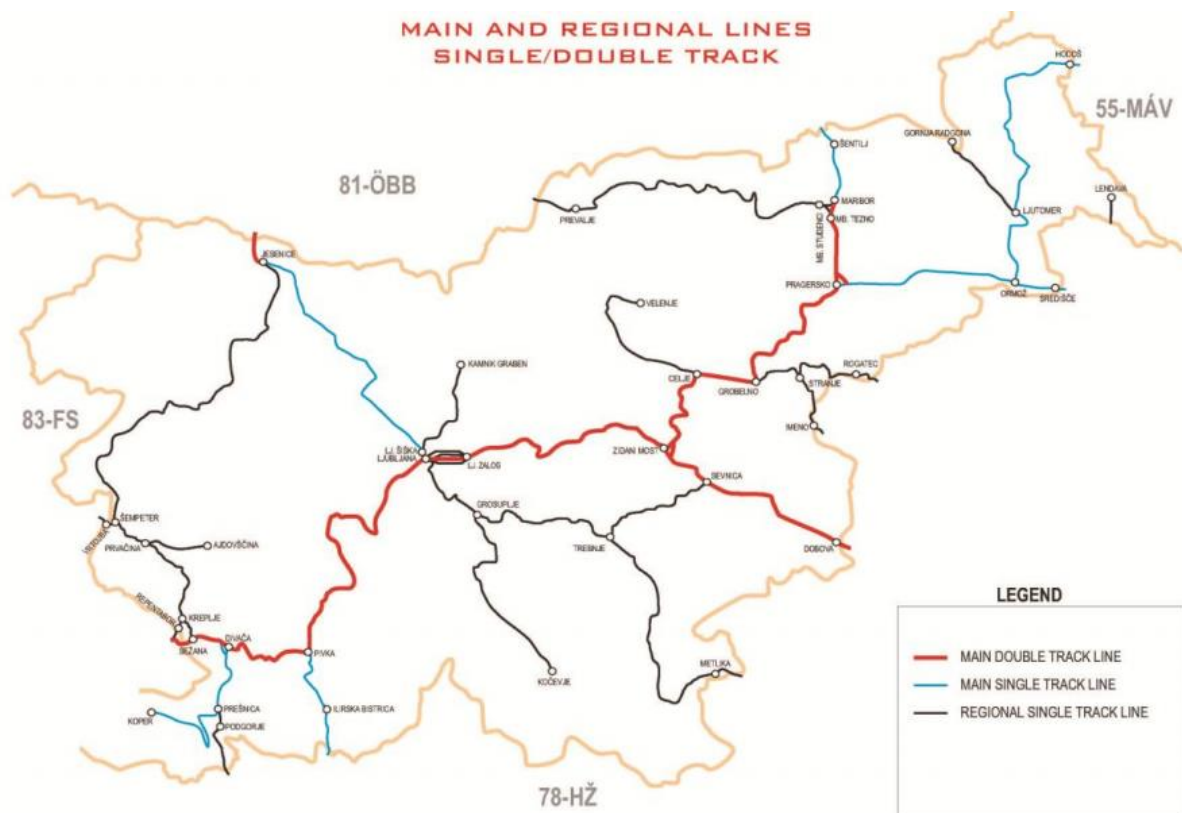


Figure 9: Slovenian Railway network, single and double-track lines. (Source: Slovenian Railways)

The public rail infrastructure network of the Republic of Slovenia comprises in total 1.208 km of lines where there are 615 km of major and 593 km of regional lines. The main lines of the public railway infrastructure network are:

- E 65: state border-Jesenice-Ljubljana-Pivka-Ilirska Bistrica-state border,
- E 67: Zidani most-Maribor-Šentilj-state border,
- E 69: state border-Središče ob Dravi-Pragersko-Zidani most-Ljubljana-Divača-Koper passenger-junction Bivje-Koper cargo,
- E 70: state border-Dobova-Ljubljana-Sežana-state border and
- T 69: Ormož-Murska Sobota-Hodoš-state border.

Most of the railway lines in Slovenia are single track. There are more than 874 km of single track and almost 334 km of double track lines.

Most of the main lines consist of double track railway lines. As it is shown on figure 9, the only single track lines in the pilot area are between Koper-Divača, the line of the Vth corridor and the line state border with Austria-Jesenice-Ljubljana, on the Xth corridor.

The railway network in Slovenia is not completely electrified as it is shown on figure 10. There are 609.7 km of electrified railway lines (330.9 km double and 278.8 km single-track), almost entirely with the DC system of the 3 kV nominal voltage. Only the border sections electrification is carried out with a system owned by the neighbouring countries Austria (15 kV, 16.67 Hz), Croatia (25 kV, 50 Hz) and Hungary (25 kV, 50 Hz). The network is powered by 25 electric power supply stations.

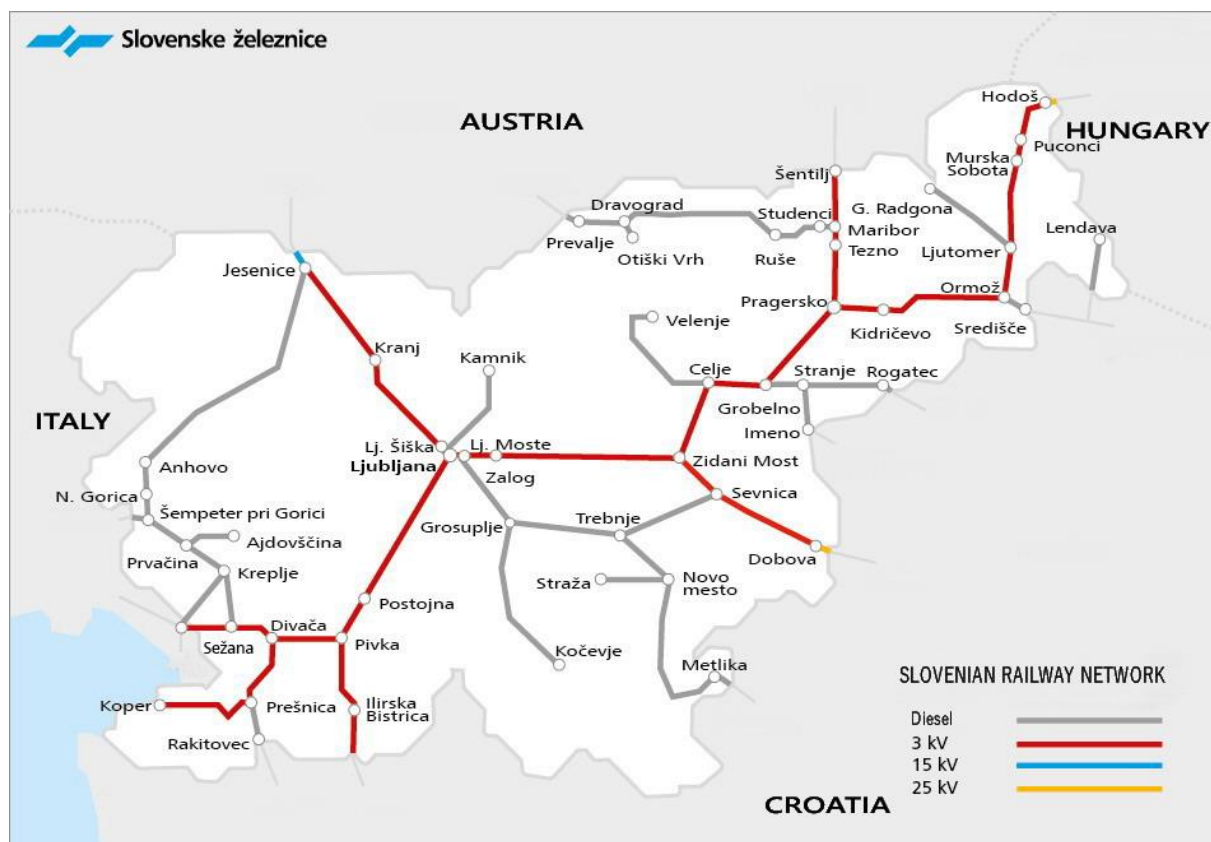


Figure 10: Slovenian Railway network according to the type of propellant (diesel, electrified lines). (Source: Slovenian Railways)

#	means of tr.	departure [hh:mm]	arrival [hh:mm]	duration [hh:mm]	nr. of interm. stops	conv. one-way ticket price [€]
From Ljubljana to Koper						
1	LPV + BUS	04:30	07:06	02:36	19	9,56
	working days only, also stops in Postojna (5:31), transfer to the bus in Divača (6:05)					
2	RG + BUS	06:00	08:43	02:43	9	9,56
	every day, also stops in Postojna (6:55), transfer to the bus in Divača (7:28)					
3	IC + BUS	10:21	12:40	02:19	7	11,36
	every day, also stops in Postojna (11:18), transfer to the bus in Divača (11:52)					
4	LPV + BUS	15:45	18:12	02:27	16	9,56
	Monday-Thursday + Saturday, also stops in Postojna (16:48), transfer to the bus in Divača (17:22)					
5	IC	17:47	20:07	02:20	7	11,36
	every day, also stops in Postojna (18:44)					
From Koper to Ljubljana						
1	IC	05:25	07:48	02:23	11	11,36
	every day, also stops in Postojna (6:49)					
2	BUS + LPV	10:03	12:36	02:33	16	9,56
	every day, transfer to the train in Divača (10:47), also stops in Postojna (11:33)					
3	BUS + LP	13:52	16:25	02:33	20	9,56
	working days only, transfer to the train in Divača (14:41), also stops in Postojna (15:18)					
4	BUS + IC	14:45	17:04	02:19	7	11,36
	every day, transfer to the train in Divača (15:29), also stops in Postojna (16:03)					
5	BUS + RG	19:20	21:48	02:28	10	9,56
	every day, transfer to the train in Divača (20:07), also stops in Postojna (20:50)					

Figure 12: Slovenian Railway timetables for the public passenger transport between Ljubljana and Koper – and vice versa valid from Dec. 2018 to Jul. 2019. (Source: <https://www.slo-zeleznice.si/sl/potniki/vozni-redi>)

Public transport in the pilot area is carried out by trains and buses. The demonstration of used means of transport in pilot area are shown in figures below. There are also the explanation of abbreviations for the means of transport used in the report.



Figure 13: LPV – local train



Figure 14: RG – regional train



Figure 15: IC – InterCity

Figure 16: BUS – bus

The state of the railway infrastructure, where the connections exist in this case only between Ljubljana and Koper is clearly reflected in timetables of passenger trains. In addition to only up to five journeys available per day, just one is fully completed by train, while the other four, between Divača and Koper, are currently carried out by bus. For this reason and due to short distances, it turns out that the railway in the area of interest isn't the most appropriate way of transporting passengers. In this case, also considering the much better quality of the Slovenian road network, bus transport is a far better choice.

In table below the statistics of railway traffic at main train stations from March 2018 is presented. It shows that the strongest station in Ljubljana is the result of the radial structure type of the railway network in region.

Table 2: Statistics of the total numbers of passengers entering and exiting train at main train stations from March 2018 in pilot area. (Source: Slovenske železnice - Potniški promet)

	Entering								
Number of passengers	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Average Daily Traffic	Average Weekday Traffic
Ljubljana	8.973	9.386	8.541	10.041	12.001	2.263	1.933	7.591	9.788
Kranj	601	610	589	626	620	146	91	469	609
Postojna	243	239	231	204	266	63	108	193	237
Koper	67	91	78	140	105	76	92	93	96
	Exiting								
Number of passengers	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Average daily traffic	Average Weekday Traffic
Ljubljana	9.146	8.196	7.356	8.338	8.322	2.155	4.078	6.799	8.272
Kranj	610	767	580	736	838	104	103	534	706
Postojna	222	237	207	243	309	63	89	196	244
Koper	91	103	120	91	145	64	129	106	110

As far as tourist attractions are concerned, just few of them are well accessible by train the city of Ljubljana, where the railway station is almost in the city centre and conditionally the Postojna Cave, which is 2.1 km walking distance away from the train station Postojna, what takes about half an hour on foot or in distance 2 km and alternatively about 7 minutes for 2.5 km by car.

3.2 Road public transport services

Road infrastructure in Slovenia consists of nearly 39,000 kilometres of public roads. The road network is well developed and is significantly better compared to the railway network, what is also considered for the pilot area.

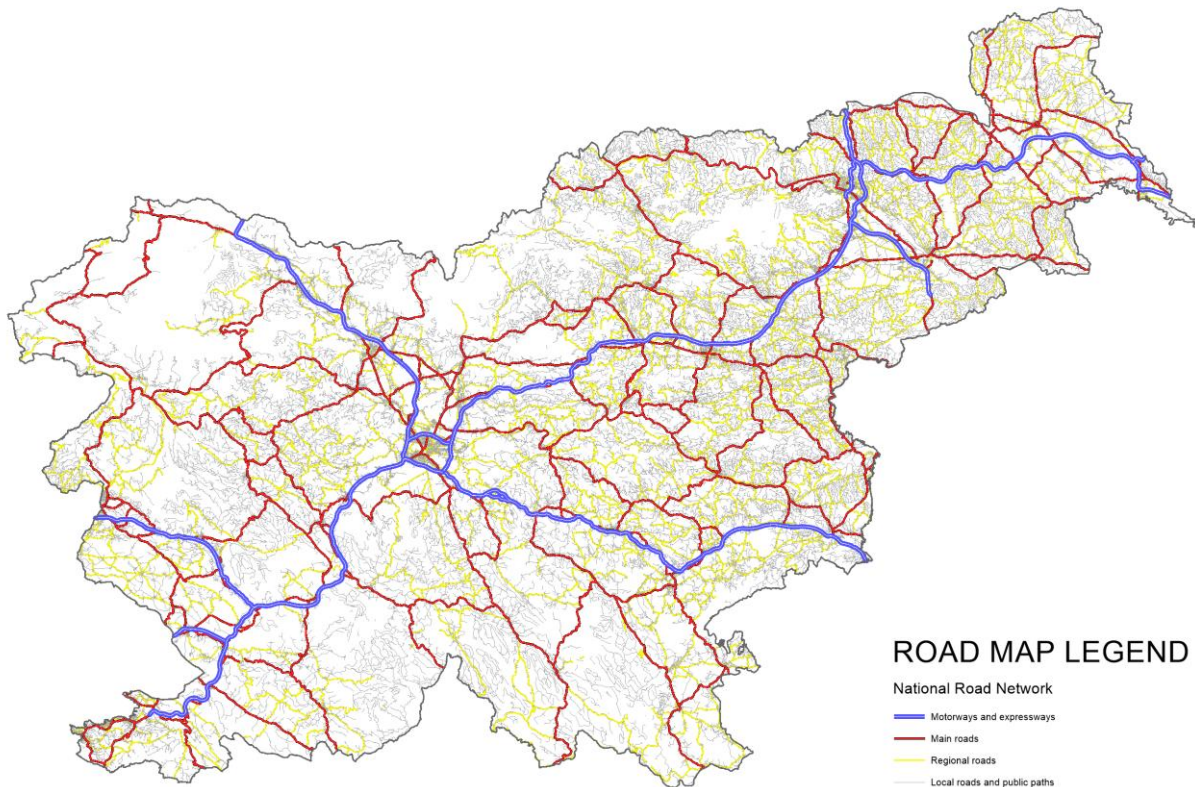


Figure 17: Slovenian road network. (Source: Here maps)

In Slovenia there are 781 km of motorways and expressways (coloured blue), which are managed by the DARS, 807 km of main (coloured red) and 5,129 km of regional roads (coloured yellow) are managed by the Slovenian Infrastructure Agency (DRSI), while 13,361 km of local roads and 18,885 km of public paths (both coloured grey) are managed by the local communities.

The most important transport hubs, included Ljubljana central station, Cruise terminal in Port of Koper and Ljubljana Jože Pučnik Airport are well connected to urban centres in pilot area by motorways and a highway, as well as by roads of lower ranks. The main connection between Ljubljana and Koper are the A1 motorway, a part of the E61, and few kilometres of the H5 highway towards Koper, whilst the main connection between Ljubljana and its airport is the A2 motorway, as well a part of the European route E61.

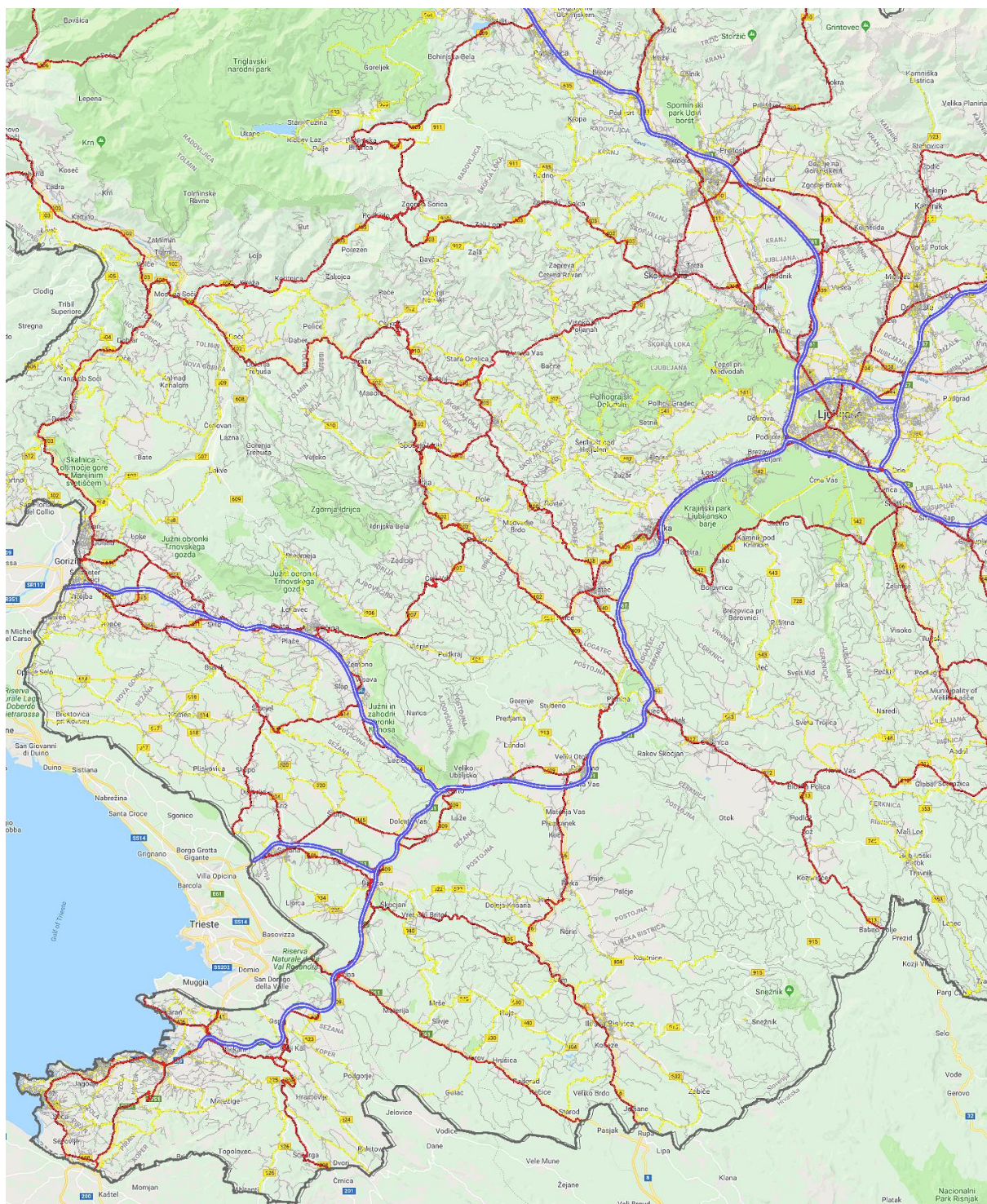


Figure 18: Road network on the pilot area. (Source: Google)

The shortest road path between the central station in Ljubljana and Koper is 104 km long and takes around an hour and 10 minutes by car in case of no congestions, while it takes an additional hour longer by bus. The shortest route between the Ljubljana main bus station and the Ljubljana Airport is about 26 km long and takes about 23 minutes by car and approximately 30 to 50 minutes by bus, depending on the departure time, the number of stops and the selected route.

Along the route between Ljubljana and Koper there are some major attractions, especially the cities of Ljubljana and Koper and the Postojna Cave, whilst also the Predjama Castle, Rakov Škocjan landscape park, the Škocjan Caves and Lipica are relatively close to the motorway. Along the route between Ljubljana and the Ljubljana Jože Pučnik Airport, the attraction is the city of Ljubljana. Ljubljana and Koper are also important starting points for visiting other attractions.

At this time the Ljubljana Jože Pučnik Airport is connected with Ljubljana by the bus passenger transport, which is carried out by the public company Ljubljanski potniški promet and the company Arriva Alpetour. Regular bus lines with 19 to 23 stops run through Trzin, Mengeš and Komenda. The journey between Ljubljana and the airport takes up to 50 minutes. One way ticket costs 4.10€. As it is shown on figure 19 below, the timetable includes 16 bus rides are available during the workdays from Ljubljana to the airport and back, approximately every hour between 5 am and 8 pm and 7 during the non-working days, about every second hour between 6 am and 8 pm. There is an extra ride from Ljubljana to the airport, carried out by the Arriva Alpetour company, at 4.30 am on working days, that runs via motorway and therefore only takes 31 minutes for the cost of 5.60€. Bus line connection between Ljubljana Jože Pučnik Airport and Kranj is operated by Arriva Alpetour. This bus line timetable includes 11 regular rides on working day. One way ticket costs 1,8€. There is also international line between Ljubljana and Klagenfurt with stops at the airport and Kranj, which is not allow to carry passengers between mentioned stops reasoned by cabotage.

Obviously there is demand for a regular direct bus line connecting Ljubljana and the Ljubljana Jože Pučnik Airport, which would run on the motorway at sufficiently high frequency.

Working days							
#	operator	departure [hh:mm]	arrival [hh:mm]	duration [hh:mm]	nr. of interm. stops	conv. one-way ticket price [€]	remarks
From Ljubljana to Brnik/Ljubljana Airport							
1	Arriva Dolenjska in Primorska	04:30	05:01	00:31	5	5,60	rel. AP Ljubljana-Brnik/Ljubljana Airport, via motorway
2	JP Ljubljanski potniški promet	05:20	06:00	00:40	19	4,10	rel. AP Ljubljana-Brnik/Ljubljana Airport, via Trzin-Mengeš-Komenda
3	Arriva Alpetour	06:10	06:57	00:47	19	4,10	rel. AP Ljubljana-Brnik/Ljubljana Airport, via Trzin-Mengeš-Komenda
4	JP Ljubljanski potniški promet	07:10	07:57	00:47	19	4,10	rel. AP Ljubljana-Brnik/Ljubljana Airport, via Trzin-Mengeš-Komenda
5	Arriva Alpetour	08:10	08:57	00:47	19	4,10	rel. AP Ljubljana-Brnik/Ljubljana Airport, via Trzin-Mengeš-Komenda
6	JP Ljubljanski potniški promet	09:10	09:57	00:47	19	4,10	rel. AP Ljubljana-Brnik/Ljubljana Airport, via Trzin-Mengeš-Komenda
7	Arriva Alpetour	10:10	10:57	00:47	19	4,10	rel. AP Ljubljana-Brnik/Ljubljana Airport, via Trzin-Mengeš-Komenda
8	JP Ljubljanski potniški promet	11:10	11:57	00:47	19	4,10	rel. AP Ljubljana-Brnik/Ljubljana Airport, via Trzin-Mengeš-Komenda
9	Arriva Alpetour	12:10	12:57	00:47	19	4,10	rel. AP Ljubljana-Brnik/Ljubljana Airport, via Trzin-Mengeš-Komenda
10	JP Ljubljanski potniški promet	13:10	13:57	00:47	19	4,10	rel. AP Ljubljana-Brnik/Ljubljana Airport, via Trzin-Mengeš-Komenda
11	Arriva Alpetour	14:10	14:57	00:47	19	4,10	rel. AP Ljubljana-Brnik/Ljubljana Airport, via Trzin-Mengeš-Komenda
12	JP Ljubljanski potniški promet	15:10	15:57	00:47	19	4,10	rel. AP Ljubljana-Brnik/Ljubljana Airport, via Trzin-Mengeš-Komenda
13	Arriva Alpetour	16:10	16:57	00:47	19	4,10	rel. AP Ljubljana-Brnik/Ljubljana Airport, via Trzin-Mengeš-Komenda
14	JP Ljubljanski potniški promet	17:10	17:57	00:47	19	4,10	rel. AP Ljubljana-Brnik/Ljubljana Airport, via Trzin-Mengeš-Komenda
15	Arriva Alpetour	18:10	18:57	00:47	19	4,10	rel. AP Ljubljana-Brnik/Ljubljana Airport, via Trzin-Mengeš-Komenda
16	JP Ljubljanski potniški promet	19:10	19:57	00:47	19	4,10	rel. AP Ljubljana-Brnik/Ljubljana Airport, via Trzin-Mengeš-Komenda
17	Arriva Alpetour	20:10	20:57	00:47	19	4,10	rel. AP Ljubljana-Brnik/Ljubljana Airport, via Trzin-Mengeš-Komenda
From Brnik/Ljubljana Airport to Ljubljana							
1	Arriva Alpetour	05:00	05:50	00:50	23	4,10	rel. Brnik/Ljubljana Airport-AP Ljubljana, via Komenda-Mengeš-Trzin
2	JP Ljubljanski potniški promet	06:05	06:55	00:50	22	4,10	rel. Brnik/Ljubljana Airport-AP Ljubljana, via Komenda-Mengeš-Trzin
3	Arriva Alpetour	07:00	07:50	00:50	23	4,10	rel. Brnik/Ljubljana Airport-AP Ljubljana, via Komenda-Mengeš-Trzin
4	JP Ljubljanski potniški promet	08:00	08:50	00:50	22	4,10	rel. Brnik/Ljubljana Airport-AP Ljubljana, via Komenda-Mengeš-Trzin
5	Arriva Alpetour	09:00	09:50	00:50	23	4,10	rel. Brnik/Ljubljana Airport-AP Ljubljana, via Komenda-Mengeš-Trzin
6	JP Ljubljanski potniški promet	10:00	10:50	00:50	22	4,10	rel. Brnik/Ljubljana Airport-AP Ljubljana, via Komenda-Mengeš-Trzin
7	Arriva Alpetour	11:00	11:50	00:50	23	4,10	rel. Brnik/Ljubljana Airport-AP Ljubljana, via Komenda-Mengeš-Trzin
8	JP Ljubljanski potniški promet	12:00	12:50	00:50	22	4,10	rel. Brnik/Ljubljana Airport-AP Ljubljana, via Komenda-Mengeš-Trzin
9	Arriva Alpetour	13:00	13:50	00:50	23	4,10	rel. Brnik/Ljubljana Airport-AP Ljubljana, via Komenda-Mengeš-Trzin
10	JP Ljubljanski potniški promet	14:00	14:50	00:50	22	4,10	rel. Brnik/Ljubljana Airport-AP Ljubljana, via Komenda-Mengeš-Trzin
11	Arriva Alpetour	15:00	15:50	00:50	23	4,10	rel. Brnik/Ljubljana Airport-AP Ljubljana, via Komenda-Mengeš-Trzin
12	JP Ljubljanski potniški promet	16:00	16:50	00:50	22	4,10	rel. Brnik/Ljubljana Airport-AP Ljubljana, via Komenda-Mengeš-Trzin
13	Arriva Alpetour	17:00	17:50	00:50	23	4,10	rel. Brnik/Ljubljana Airport-AP Ljubljana, via Komenda-Mengeš-Trzin
14	JP Ljubljanski potniški promet	18:00	18:50	00:50	22	4,10	rel. Brnik/Ljubljana Airport-AP Ljubljana, via Komenda-Mengeš-Trzin
15	Arriva Alpetour	19:00	19:50	00:50	23	4,10	rel. Brnik/Ljubljana Airport-AP Ljubljana, via Komenda-Mengeš-Trzin
16	JP Ljubljanski potniški promet	20:00	20:50	00:50	22	4,10	rel. Brnik/Ljubljana Airport-AP Ljubljana, via Komenda-Mengeš-Trzin
Weekends and national holidays (free days)							
#	operator	departure [hh:mm]	arrival [hh:mm]	duration [hh:mm]	nr. of interm. stops	conv. one-way ticket price [€]	remarks
From Ljubljana to Brnik/Ljubljana Airport							
1	JP Ljubljanski potniški promet	06:10	06:57	00:47	19	4,10	rel. AP Ljubljana-Brnik/Ljubljana Airport, via motorway
2	JP Ljubljanski potniški promet	09:10	09:57	00:47	19	4,10	rel. AP Ljubljana-Brnik/Ljubljana Airport, via Trzin-Mengeš-Komenda
3	JP Ljubljanski potniški promet	11:10	11:57	00:47	19	4,10	rel. AP Ljubljana-Brnik/Ljubljana Airport, via Trzin-Mengeš-Komenda
4	JP Ljubljanski potniški promet	13:10	13:57	00:47	19	4,10	rel. AP Ljubljana-Brnik/Ljubljana Airport, via Trzin-Mengeš-Komenda
5	JP Ljubljanski potniški promet	15:10	15:57	00:47	19	4,10	rel. AP Ljubljana-Brnik/Ljubljana Airport, via Trzin-Mengeš-Komenda
6	JP Ljubljanski potniški promet	17:10	17:57	00:47	19	4,10	rel. AP Ljubljana-Brnik/Ljubljana Airport, via Trzin-Mengeš-Komenda
7	JP Ljubljanski potniški promet	19:10	19:57	00:47	19	4,10	rel. AP Ljubljana-Brnik/Ljubljana Airport, via Trzin-Mengeš-Komenda
1	JP Ljubljanski potniški promet	07:00	07:50	00:50	22	4,10	rel. Brnik/Ljubljana Airport-AP Ljubljana, via Komenda-Mengeš-Trzin
2	JP Ljubljanski potniški promet	10:00	10:50	00:50	22	4,10	rel. Brnik/Ljubljana Airport-AP Ljubljana, via Komenda-Mengeš-Trzin
3	JP Ljubljanski potniški promet	12:00	12:50	00:50	22	4,10	rel. Brnik/Ljubljana Airport-AP Ljubljana, via Komenda-Mengeš-Trzin
4	JP Ljubljanski potniški promet	14:00	14:50	00:50	22	4,10	rel. Brnik/Ljubljana Airport-AP Ljubljana, via Komenda-Mengeš-Trzin
5	JP Ljubljanski potniški promet	16:00	16:50	00:50	22	4,10	rel. Brnik/Ljubljana Airport-AP Ljubljana, via Komenda-Mengeš-Trzin
6	JP Ljubljanski potniški promet	18:00	18:50	00:50	22	4,10	rel. Brnik/Ljubljana Airport-AP Ljubljana, via Komenda-Mengeš-Trzin
7	JP Ljubljanski potniški promet	20:00	20:50	00:50	22	4,10	rel. Brnik/Ljubljana Airport-AP Ljubljana, via Komenda-Mengeš-Trzin

Figure 19: Timetables for the BUS public passenger transport between Ljubljana and the Ljubljana Airport – and vice versa valid for 2019. (Source: <https://www.ap-ljubljana.si/vozni-red/>)

The timetables of bus services between Ljubljana and Koper are much more diverse, while offering even fewer opportunities. Bus services are carried out by five different operators, the number of intermediate stops is ranging between 0 and 31, and the duration of the journey is between 1 hour and 15 minutes, and 2 hours and 26 minutes. Most rides are available on weekdays, followed by public holidays, Sundays, and the least Saturdays. Most non-direct lines stop at Postojna, a couple of them even at the tourist point of interest Postojna Cave. The timetable of bus services between Ljubljana and Koper and vice versa is presented in figure 20.

Working days							
#	operator	departure [hh:mm]	arrival [hh:mm]	duration [hh:mm]	nr. of interm. stops	conv. one-way ticket price [€]	remarks
From Ljubljana to Koper							
1	Arriva Dolenjska in Primorska	06:05	08:25	02:20	31	11,10	AP Ljubljana-Piran; Postojna at 7:12
2	NOMAGO	07:40	09:34	01:54	14	12,20	Celje-Lucija; Postojna at 8:24
3	Arriva Dolenjska in Primorska	08:15	10:23	02:08	22	11,10	AP Ljubljana-Koper; Postojna at 9:05, Postojna Cave at 9:08
4	AP Murska Sobota d.d.	10:10	11:58	01:48	5	11,10	Lendava-Piran; Postojna at 10:55
5	Arriva Dolenjska in Primorska	12:00	14:08	02:08	22	11,10	AP Ljubljana-Koper; Postojna at 12:50, Postojna Cave at 12:53
6	Arriva Dolenjska in Primorska	15:00	17:23	02:23	31	11,10	AP Ljubljana-Piran; Postojna at 16:10
7	Šamu Josip s.p.	15:35	16:50	01:15	0	11,10	AP Ljubljana-Koper
8	Arriva Dolenjska in Primorska	17:00	19:18	02:18	30	11,10	AP Ljubljana-Koper
9	KOZEL IVAN s. p.	21:35	23:16	01:41	3	12,00	Bihač-Koper
From Koper to Ljubljana							
1	Arriva Dolenjska in Primorska	04:51	07:10	02:19	25	11,10	Piran-AP Ljubljana; Postojna at 6:05
2	Arriva Dolenjska in Primorska	07:50	09:56	02:06	20	11,10	Koper-AP Ljubljana; Postojna at 8:52
3	Arriva Dolenjska in Primorska	10:50	13:11	02:21	30	11,10	Piran-AP Ljubljana; Postojna at 12:05
4	Arriva Dolenjska in Primorska	12:40	15:01	02:21	26	11,10	Piran-AP Ljubljana; Postojna Cave at 13:46, Postojna at 13:55
5	AP Murska Sobota d.d.	14:52	16:50	01:58	5	11,10	Piran-Murska Sobota; Postojna at 16:05
6	KOZEL IVAN s. p.	15:00	16:40	01:40	2	12,00	Koper-Bihač
7	NOMAGO	16:45	18:40	01:55	14	12,20	Lucija-Celje; Postojna at 17:56
8	Šamu Josip s.p.	17:15	18:30	01:15	0	11,10	Koper-AP Ljubljana
9	Arriva Dolenjska in Primorska	19:40	21:56	02:16	25	11,10	Piran-AP Ljubljana; Postojna at 20:50
Saturdays							
#	operator	departure [hh:mm]	arrival [hh:mm]	duration [hh:mm]	nr. of interm. stops	conv. one-way ticket price [€]	remarks
From Ljubljana to Koper							
1	NOMAGO	07:40	09:34	01:54	14	12,20	Celje-Lucija; Postojna at 8:24
2	AP Murska Sobota d.d.	10:10	11:58	01:48	5	9,60	Lendava-Piran; Postojna at 10:55
From Koper to Ljubljana							
1	AP Murska Sobota d.d.	14:52	16:50	01:58	5	9,60	Piran-Murska Sobota; Postojna at 16:05
2	NOMAGO	16:45	18:40	01:55	14	12,20	Lucija-Celje; Postojna at 17:56
Sundays							
#	operator	departure [hh:mm]	arrival [hh:mm]	duration [hh:mm]	nr. of interm. stops	conv. one-way ticket price [€]	remarks
From Ljubljana to Koper							
1	NOMAGO	07:40	09:34	01:54	14	12,20	Celje-Lucija; Postojna at 8:24
2	Arriva Dolenjska in Primorska	08:00	10:08	02:08	22	11,10	AP Ljubljana-Lucija TPC; Postojna at 8:50, Postojna Cave at 8:53
3	AP Murska Sobota d.d.	10:10	11:58	01:48	5	11,10	Murska Sobota-Piran; Postojna at 10:55
4	Arriva Dolenjska in Primorska	15:00	17:23	02:23	31	11,10	AP Ljubljana-Piran; Postojna at 16:10
5	AP Murska Sobota d.d.	20:30	21:45	01:15	0	9,60	Murska Sobota-Piran
From Koper to Ljubljana							
1	Arriva Dolenjska in Primorska	13:15	15:41	02:26	31	11,10	Lucija TPC-AP Ljubljana; Postojna at 14:30, Postojna Cave at 14:33
2	AP Murska Sobota d.d.	14:52	16:50	01:58	5	11,10	Piran-Murska Sobota; Postojna at 16:05
3	NOMAGO	16:45	18:40	01:55	14	12,20	Lucija-Celje; Postojna at 17:56
4	Arriva Dolenjska in Primorska	19:30	21:51	02:21	30	11,10	Piran-AP Ljubljana; Postojna at 20:45
5	Šamu Josip s.p.	20:30	21:45	01:15	0	11,10	Koper-AP Ljubljana
National holidays (free days)							
#	operator	departure [hh:mm]	arrival [hh:mm]	duration [hh:mm]	nr. of interm. stops	conv. one-way ticket price [€]	remarks
From Ljubljana to Koper							
1	Arriva Alpetour	06:40	07:55	01:15	0	11,10	Škofja Loka-Lucija TPC
2	NOMAGO	07:40	09:34	01:54	14	12,20	Celje-Lucija; Postojna at 8:24
3	Arriva Dolenjska in Primorska	08:00	10:08	02:08	22	11,10	AP Ljubljana-Lucija TPC; Postojna at 8:50, Postojna Cave at 8:53
4	AP Murska Sobota d.d.	10:10	11:58	01:48	4	9,60	Murska Sobota-Piran
5	Arriva Alpetour	11:10	12:25	01:15	0	11,10	AP Ljubljana-Lucija TPC
6	Arriva Dolenjska in Primorska	15:00	17:23	02:23	31	11,10	AP Ljubljana-Piran; Postojna at 16:10
7	KOZEL IVAN s. p.	21:35	23:16	01:41	3	12,00	Bihač-Koper
From Koper to Ljubljana							
1	Arriva Alpetour	11:10	12:25	01:15	0	11,10	Lucija TPC-Škofja Loka
2	Arriva Dolenjska in Primorska	13:15	15:41	02:26	31	11,10	Lucija TPC-AP Ljubljana; Postojna at 14:30, Postojna Cave at 14:33
3	AP Murska Sobota d.d.	14:52	16:50	01:58	5	11,10	Piran-Murska Sobota; Postojna at 16:05
4	KOZEL IVAN s. p.	15:00	16:40	01:40	2	12,00	Koper-Bihač
5	NOMAGO	16:45	18:40	01:55	14	12,20	Lucija-Celje; Postojna at 17:56
6	Arriva Alpetour	19:20	20:35	01:15	0	11,10	Lucija TPC-Škofja Loka
7	Arriva Dolenjska in Primorska	19:30	21:51	02:21	30	11,10	Piran-AP Ljubljana; Postojna at 20:45

Figure 20: Timetables for the BUS public passenger transport between Ljubljana and Koper with stops at major bus stations (e.g. Postojna) and vice versa valid for 2019. (Source: <https://www.ap-ljubljana.si/vozni-red/>)

However, there is a lack of faster and more direct lines, which would include stop in Postojna as a most important regional urban centre. Other destinations in region are too far from the main route so it

would only be appropriate to cover them with complementary lines. Additionally for a ride between rail station and bus station in Postojna and Postojna Cave or Predjama Castle touristic shuttle bus would be appropriate as a last mile solution for travellers. In accordance to the Tourism development strategy of the municipality of Postojna the establishment of shuttle bus service between public transport stations and tourist attractions has already been recognised as a priority measure in period between 2018 and 2023.

Shuttle services in pilot area are important component of overall transport system. There are several companies offering shuttle services especially among main transport hubs and most important tourist attractions. As it is more flexible mode of transport, it is usually used in touristic and business purposes. The most important shuttle service operators are GoOpti, Nomago, ZUP prevozi and RIDECAR.

The time flexible shared shuttle services, operated by companies mentioned above, connecting Ljubljana, Ljubljana Jože Pučnik Airport, Koper, Postojna and other points of interest in pilot area. The fare costs are respectively higher compared to bus services. One way single ticket from Ljubljana central station to Ljubljana Jože Pučnik Airport or vice versa costs from 8 € on, the same ticket type from Ljubljana central station to Koper costs from 20 € on and the same ticket type from Ljubljana Jože Pučnik Airport to Koper from 15 € on. The special emphasis has to be marked on the fact that price flexibility depends on time schedule and occupancy of the services.

There are no irregular transport service connections offered by transport operators such as Flixbus connecting cities in Slovenia, reasoned by the state legislation. Firstly, the Slovenian legislation regulate public transport services with concession model and secondly due to cabotage legislation, valid in European Union member states.

Cabotage is in accordance with EC Regulation 1073/2009 prohibited for public operators with vehicles that has 8 or more passenger seats. Passenger transport of foreign transport providers within Member State is permitted only in case it is determined by the international agreement or in particular case of a cabotage permission stipulated by the government, due to the lack of adequate transport supply in country. Legal and regulatory aspects of transport in Slovenia is detailed described in chapter 7.

As a consequence of mentioned regulations there are some transport operators that are not allowed to provide service between stops in Slovenia as a part of international lines. An example is AlpeAdria Line that operates international line between Klagenfurt in Austria and Ljubljana with additional stop at the Ljubljana Jože Pučnik Airport and Kranj. Considering the law there are not possible to travel from Ljubljana to airport or vice versa but just from Ljubljana or airport to Klagenfurt or vice versa.

In pilot area rent a car providers offer the service as a supplement of the public transport. As far as this project is concerned car rentals are significant transport providers at the main transport hubs specially for incoming tourists that come to pilot area using other mode of transport. There are several rent a car providers at the Ljubljana Jože Pučnik Airport where the supply is most developed in region. There are also possibilities for renting near Ljubljana central station and Cruise terminal in Port of Koper. Most widespread car rental agencies in pilot area are: Avantcar, Sixt, Europcar, Hertz, Avis and other.

3.3 Airport infrastructure and services

The Ljubljana Jože Pučnik Airport is the most important international airport in Slovenia. It is located 25 km northwest of the capital Ljubljana and 9 km east of Kranj. It is connected to almost 30 destinations across Europe and beyond by several regular scheduled and charter flights that are operated by the following airlines operators, shown in table below.

Table 3: Airlines operator and destinations at Ljubljana Jože Pučnik Airport (Source: Fraport Slovenija)

Airline operators	Destinations
Adria Airways	Amsterdam, Brussels, Copenhagen, Frankfurt, Munich, Zürich, Vienna, Sofia, Podgorica, Prague, Pristina, Sarajevo, Skopje, Tirana, , Paris–Charles de Gaulle,
Aeroflot	Moscow–Sheremetyevo
Air France	Paris–Charles de Gaulle
Air Serbia	Belgrade
Arkia	Tel Aviv–Ben Gurion
British Airways	London–Heathrow
easyJet	Berlin–Schönefeld, London–Gatwick, London–Stansted
Finnair	Seasonal: Helsinki
LOT Polish Airlines	Warsaw–Chopin
Montenegro Airlines	Podgorica
Sun D'Or	Tel Aviv–Ben Gurion
Transavia	Amsterdam
Turkish Airlines	Istanbul
Wizz Air	Brussels–Charleroi, London–Luton

By the survey done in 2015, most incoming travellers came to Ljubljana Jože Pučnik Airport by car (31%) and taxi (31%). Other means of transport were shuttles (16%), rent a car (13%), and public transport (9%), what is presented in figure below.

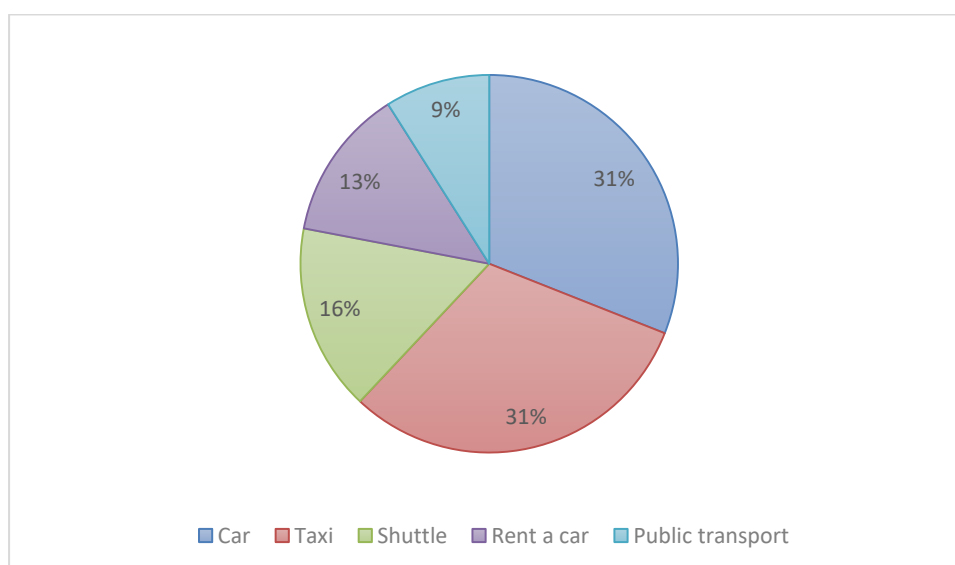


Figure 21: Modal split of trips to and from Ljubljana Jože Pučnik Airport, N=384. (Source: Inter-Connect)

From the year 2014 German transport company Fraport took a 100% ownership of the airport. The growing trend of numbers of passenger in last years was significantly increasing in the year 2017, when there was almost 20% growth change perceived. In the year 2018 the number reached 1.812.411 of passengers in total.

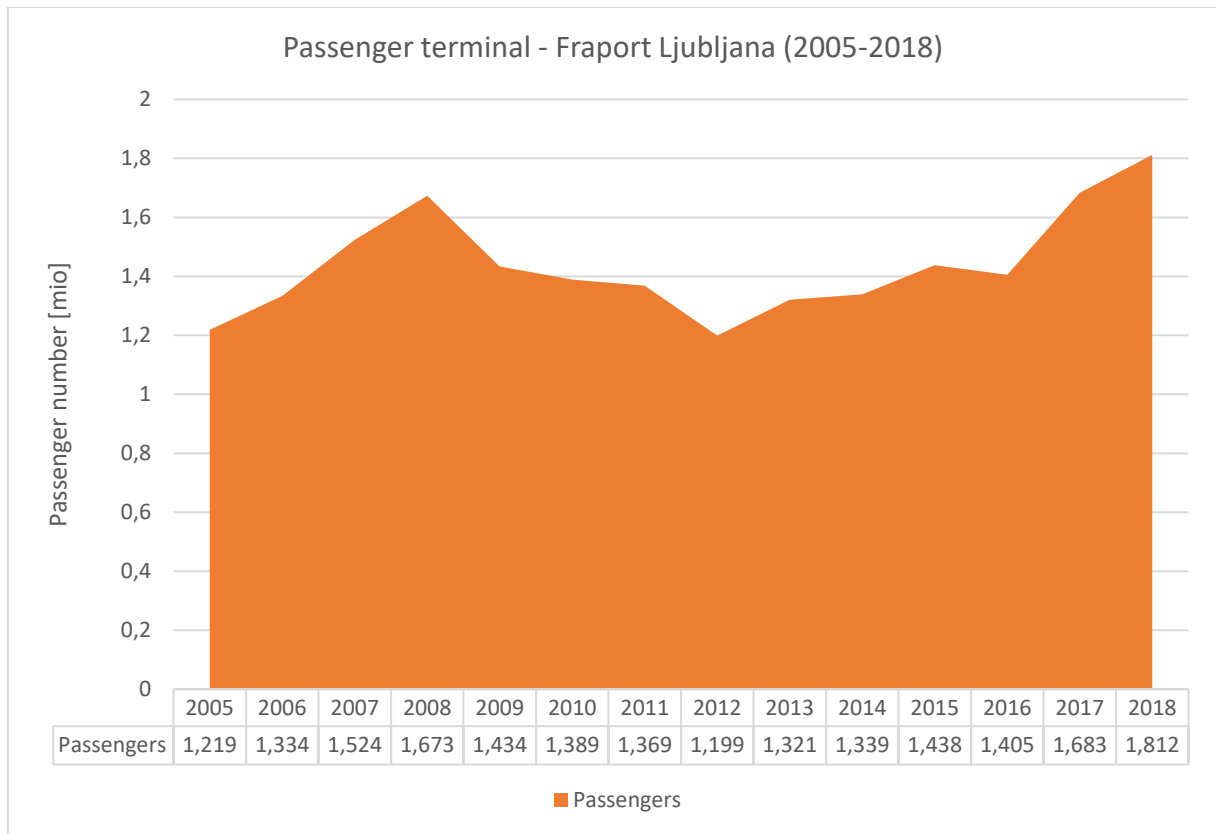


Figure 22: Passenger statistics at Ljubljana Jože Pučnik Airport. (Source: Fraport Slovenija)

There are approximately 4 million people living in the gravitational area of the Ljubljana Jože Pučnik airport with accessibility radius of 120 minutes by car, which includes entire area of Slovenia, the southern parts of Austria, the northeastern part of Italy and the northwestern part of Croatia.

In 2017 the airport operator Fraport Slovenia announced a plan to expand the existing passenger terminal at Ljubljana Jože Pučnik Airport. A modular solution is planned which means that construction can be carried out in several phases until 2040 what enable effectively and continuously adaption to development trends of traffic needs. In the first phase of the terminal expansion, capacity of the departures area will be increased from the current 500 passengers per hour to 1.280 passengers per hour. In second phase arrivals area and in third phase the additional areas for passengers check in and will be extended.

According to the Master Plan for the period from 2015-2040 published by Fraport in 2017, the compound annual growth rate of passenger transport in total is expected to be 3,4% what results in 3.283.000 of passengers in the year 2040. With the expected growth rate in 2040 airport will be the

transport hub transferring between 7.500 and 10.000 passengers daily. The development of the airport strongly depends on the provision of well-connected transport network and accessibility.

3.4 Port infrastructure and services

Port of Koper is the only Slovenian port. It is situated in northern part of Adriatic Sea and therefore is an important hub connecting Central and Southeast Europe with the Mediterranean Sea and Far East. Since 2005, Port of Koper has been able to accept cruise vessels in cruise terminal. The terminal is located only 200 meters away from the main square in the centre of Koper.

Since the beginning of cruise terminal in 2005, when there were 18 vessel calls which together brought 1.100 passengers, this numbers drastically increased and reached in 2018 in total 75 vessel calls with 101.415 passengers as it is shown in figure below.

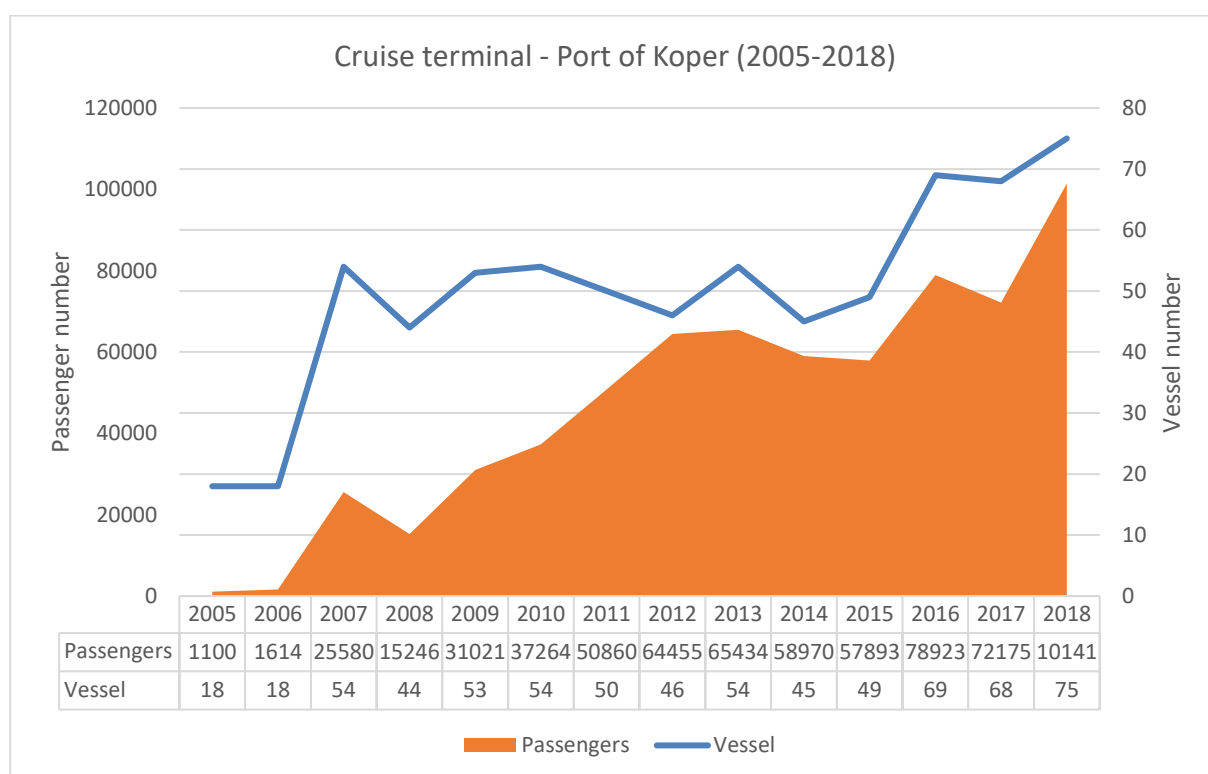


Figure 23: Passengers and vessels statistics at Cruise terminal of Port of Koper. (Source: Port of Koper, Cruise terminal)

The continuing trend of growth of cruise terminal of Port of Koper is anticipated in following years regarding to the growth of global tourism. In the development of passenger transport in Koper, the Slovenian Tourist Board and the local tourist organization of the Municipality of Koper are actively involved. Furthermore, membership in the MedCruise Mediterranean Port Association, which provides greater visibility and offers additional opportunities for promotion of the port, what contributes to increasing transport hub potential.

From the perspective of tourist potential, the Port of Koper is gaining popularity due to the diversity of tourist destinations in that can be visit during the stay. The survey carried out by Luka Koper on visited destinations on excursions from cruise terminal of Port of Koper, where multiple choice was enabled, is presented in figure 24 below. It showed that most of the tourists visit Koper, followed by Piran and Portorož, Ljubljana, Bled, Postojna and other.

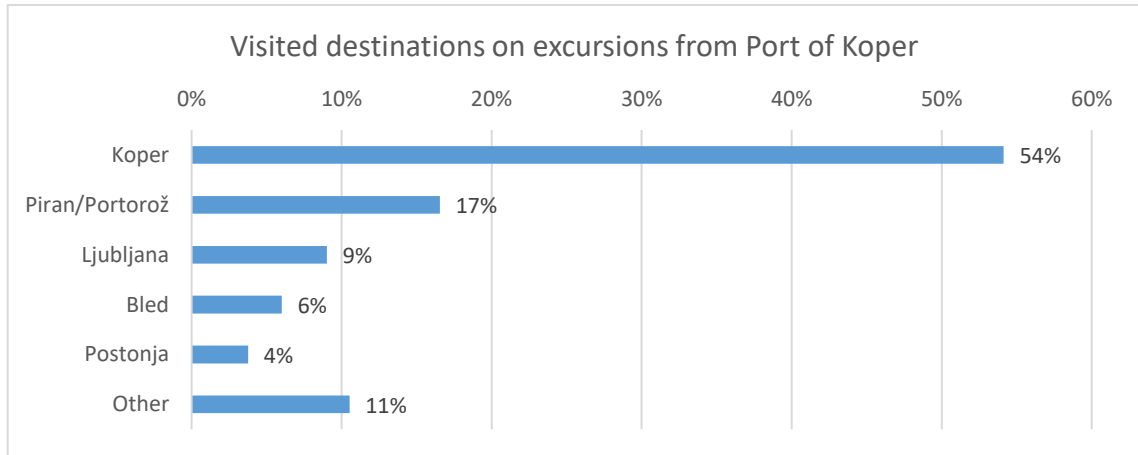


Figure 24: Survey data about visited destinations included in cruise excursions from Port of Koper. (Source: Port of Koper, Cruise terminal)

Survey on the transportation mode choice preferences of tourist carried out by Port of Koper is presented on figure below.

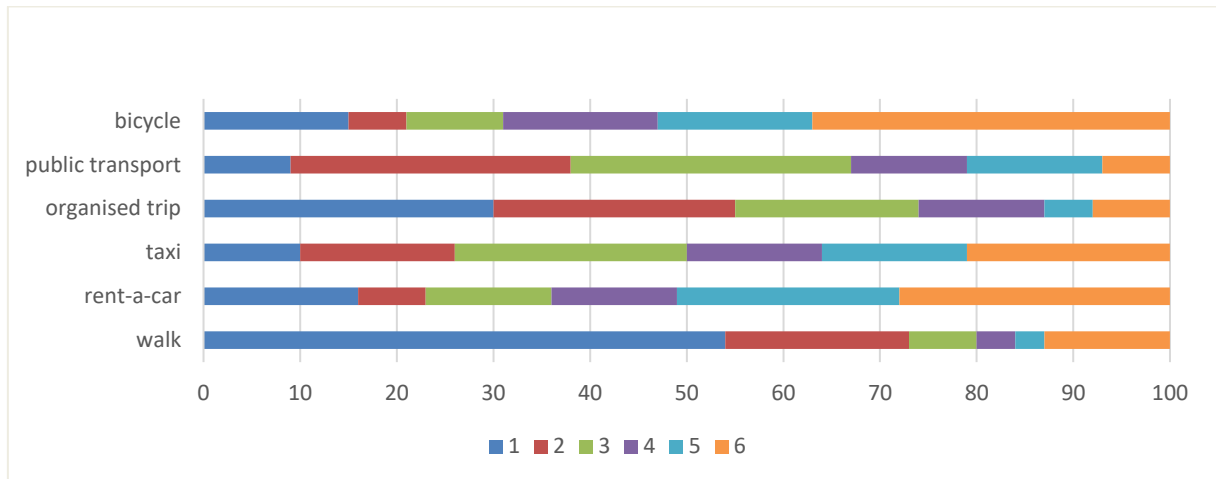


Figure 25: Survey data about transportation mode choice preference of tourists in Port of Koper. (Source: Port of Koper, Cruise terminal)

With question about most and least preferred mode to travel from Port of Koper to on shore destinations ranked in a scale from 1 to 6, while 1 is most and 6 is least preferred, the preference of transport mode choice is analysed. Most preferred by respondents is walking, as 54 % of guests ranked it as most preferred. Second most preferred mode of transport is organised trip, which is followed by rent a car, cycling, and taxi. Public transport ranks last place in modes preferred.

Within least preferred modes cycling ranks highest indicating that guests are unable or unwilling to explore the destinations by bicycle. Guests also do not show willingness to rent a car or take a private tour with taxi. Just a few guests assessed public transport as least preferred mode almost as same as organised trip. By this expressed preference following conclusion can be done, that on one hand public transport can compete with organised trips and on the other measures to improve the role of public transportation are necessary.

4 PROVISION OF PASSENGER INFORMATION SERVICE AND CUSTOMER SUPPORT

4.1 Presentation on existing timetable provision for passengers


There are several public transport information systems available for passengers in pilot area. One of the most important public transport information from the perspective of users is timetable.

First of all, passengers information about train and bus public transport is provided on every regular service train and bus station where timetables, number of operating lines and contact of transport operators are published. Passenger information boards at train and bus stations in pilot area are presented in figures below.

Time	From	Type	Line	Platform
18:32	Frankfurt Hbf	IC	213	10
18:41	Sežana	LP	2615	7
19:02	Dobova	LP	2272	12
19:04	Kamnik Graben	LP	3189	10
19:07	CD Moste	IZ	4914	1
19:20	Jesenice	LP	2415	10
19:25	Opčine	LP	1799	8
19:38	Maribor	ICB	21	6

Time	From	Type	Line	Platform
19:48	Metlika	LP	2222	1
20:00	Sežana	RG	653	7
20:04	Kamnik Graben	LP	3191	12
20:04	Dobova	LP	2274	10
20:23	Jesenice	LP	2421	11
20:35	Grosuplje	LP	3296	1
20:40	Villach Hbf	MV	315	8
20:56	Beograd	EN	414	7

Figure 26: Passenger information boards at main train station. (Source: Javniprevoz.si)



arriva company

AVTOBUSNI VOZNI RED DOMŽALE PETROL

REŽIM VOŽNJE : velja od 01.09. do 24.06.

ODHODI V SMER

VOZI OD PONDELJKA DO PETKA

ap Domžale Petrol

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271:35, 271:45, 271:55, 2
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While the era of digitalisation enable many and various possibilities of information sharing among users are there nowadays even more information about public transport service accessible online on web pages of public transport integrators, database integrators and involved partners, specially public transport operators. Not just from the regular user's perspective but also for tourists it has become the easiest way of accessing the transport information.

Public transport information is well organised and mostly accessible using Google Maps app. This app collects public transport data from the General Transit Feed Specification also known as GTFS format. A GTFS feed is composed of a series of text files collected in a ZIP file. Each file models a particular aspect of transit information such as stops, routes, trips, and other schedule data. In pilot area Google Maps app includes data of train and bus public transport. It also enable provision of data among different modes of transport. As it is shown in figure below, the passenger information interface provides several options of public transport service in pilot area between Ljubljana Jože Pučnik Airport and Postojna including transfer at Ljubljana Central Station.

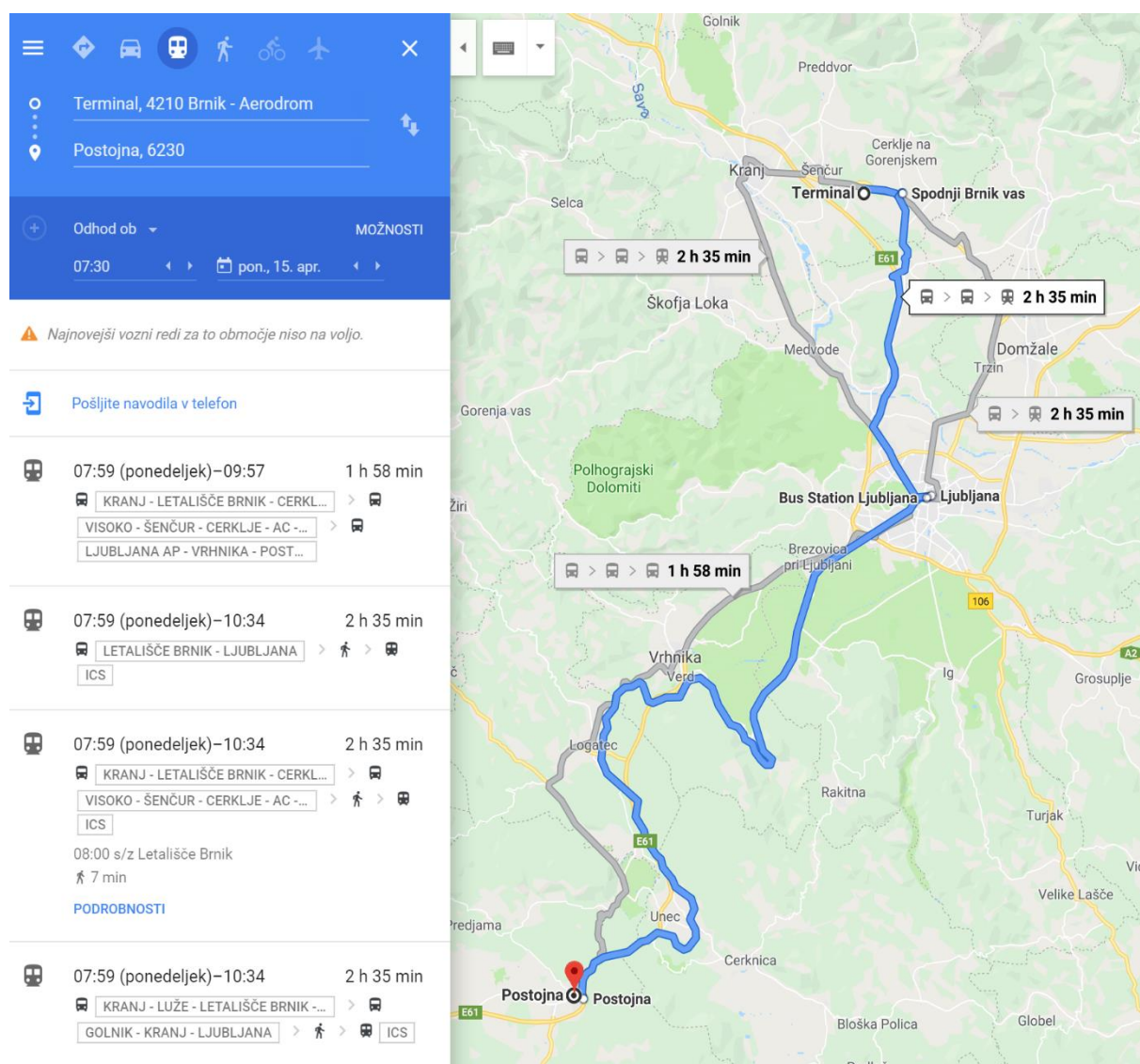
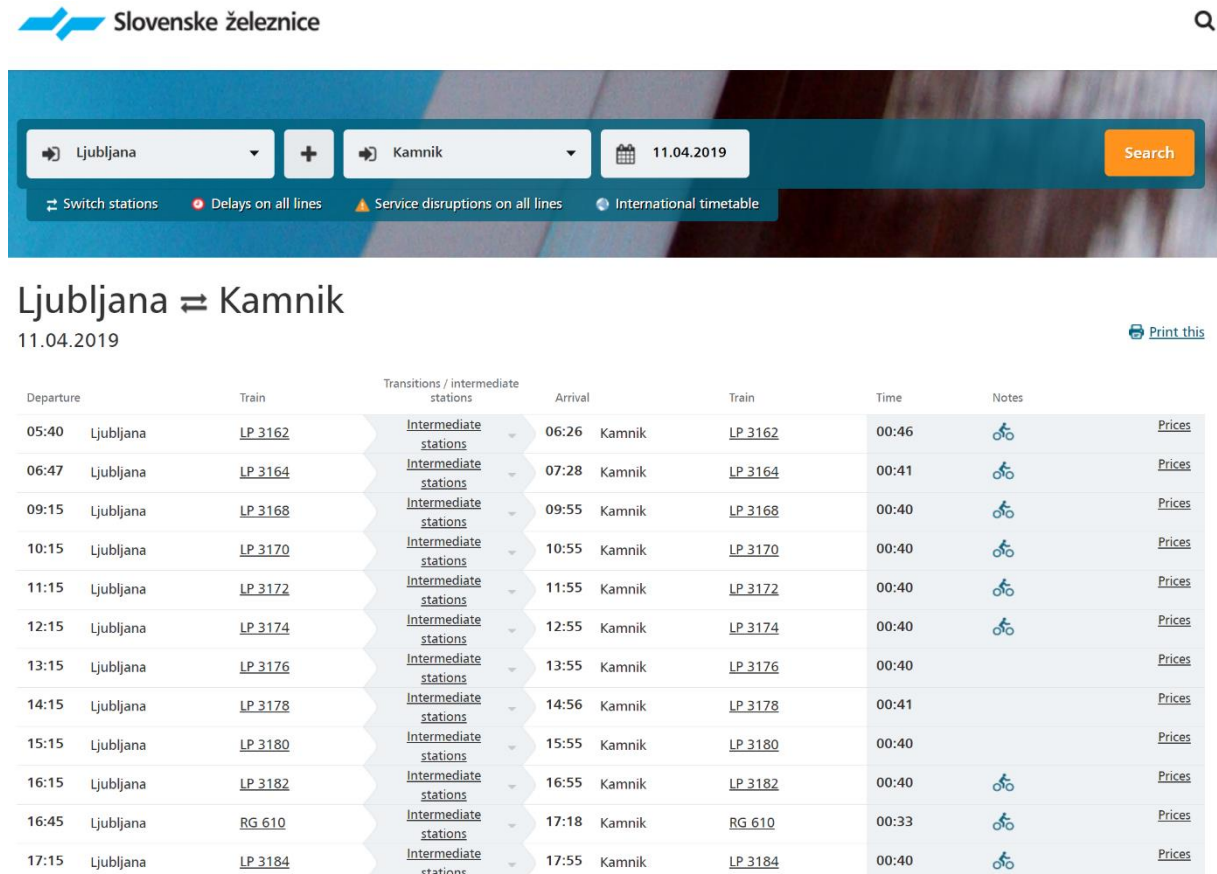


Figure 28: Public transport passenger information using Google Maps app. (Source: Google Maps)

The train passenger transport operator company Slovenske železnice has developed interactive web browser as a part of official web page, where the users are able to search for timetable between two selected train stations. The page is accessible at <https://www.slo-zeleznice.si/en>. Moreover there are also some additional passenger information such as fare prices, up to date train delays and service disruptions, train types and which lines include bike transport space.



Slovenske železnice

Search for train between **Ljubljana** and **Kamnik** on **11.04.2019**

Switch stations | Delays on all lines | Service disruptions on all lines | International timetable

Ljubljana ⇌ Kamnik

11.04.2019 [Print this](#)

Departure	Train	Transitions / intermediate stations	Arrival	Train	Time	Notes
05:40	Ljubljana LP 3162	Intermediate stations	06:26	Kamnik LP 3162	00:46	Prices
06:47	Ljubljana LP 3164	Intermediate stations	07:28	Kamnik LP 3164	00:41	Prices
09:15	Ljubljana LP 3168	Intermediate stations	09:55	Kamnik LP 3168	00:40	Prices
10:15	Ljubljana LP 3170	Intermediate stations	10:55	Kamnik LP 3170	00:40	Prices
11:15	Ljubljana LP 3172	Intermediate stations	11:55	Kamnik LP 3172	00:40	Prices
12:15	Ljubljana LP 3174	Intermediate stations	12:55	Kamnik LP 3174	00:40	Prices
13:15	Ljubljana LP 3176	Intermediate stations	13:55	Kamnik LP 3176	00:40	Prices
14:15	Ljubljana LP 3178	Intermediate stations	14:56	Kamnik LP 3178	00:41	Prices
15:15	Ljubljana LP 3180	Intermediate stations	15:55	Kamnik LP 3180	00:40	Prices
16:15	Ljubljana LP 3182	Intermediate stations	16:55	Kamnik LP 3182	00:40	Prices
16:45	Ljubljana RG 610	Intermediate stations	17:18	Kamnik RG 610	00:33	Prices
17:15	Ljubljana LP 3184	Intermediate stations	17:55	Kamnik LP 3184	00:40	Prices

Figure 29: Passenger information of train public transport service provided by Slovenske železnice. (Source: Slovenske železnice)

Moreover, information access for train passengers is mobile app named Go by train (Grem z vlakom) provided by Slovenske železnice. It is developed for both Android and iOS. At the same time, the application allows users to add the routes, where they travel most often, to their favourites. The application is directly connected to the Slovenske železnice information system and requires an active internet connection, mainly due to data refreshing on delays and disruptions in traffic. The app offers not just information but enable also online ticket purchasing. The app user interface is presented in figure below.

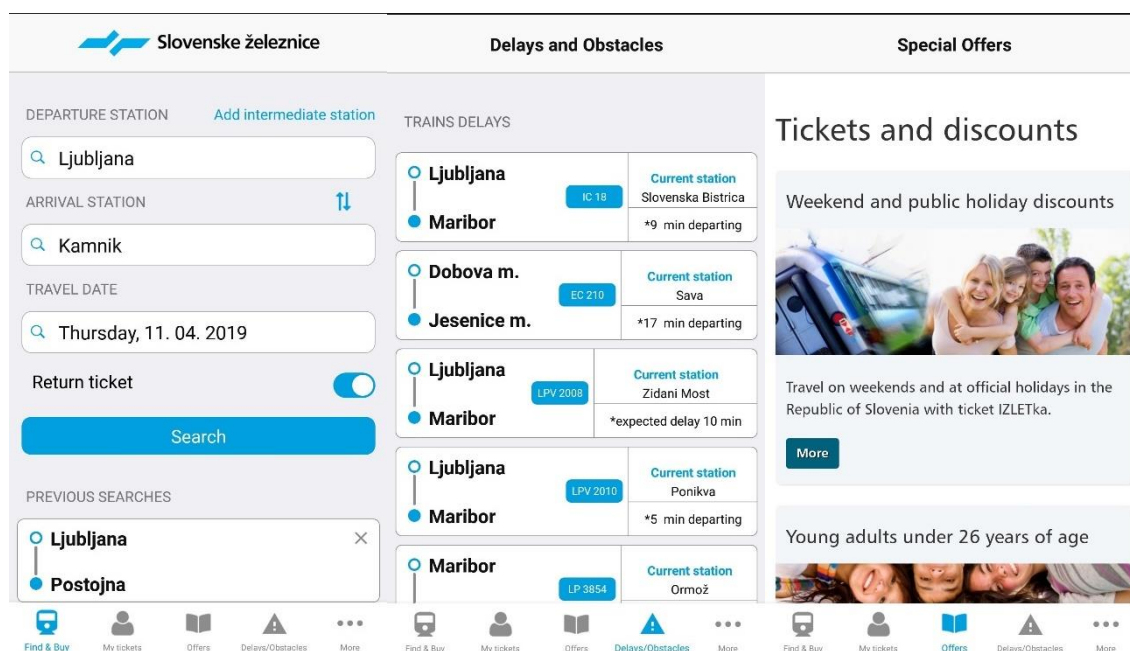


Figure 30: »Go by train« mobile app user interface. (Source: Slovenske železnice)

Regular bus public transport in pilot area is mostly provided by companies Ljubljanski potniški promet, Arriva and Nomago. Passenger information about service is provided online on several web pages. As it is shown before most common used trip planner is Google Maps app, where travellers are able to access to multimodal transport service data. While there are currently no real time public transport data in Google Maps app, web pages or mobile apps of transport service operators are more reliable in perspective of delays and line route detours.

Timetables of regional bus service are online accessible at following web pages:

- Avtobusna postaja Ljubljana: <https://www.ap-ljubljana.si/en/timetable/>
- Arriva: <https://arriva.si/en/>
- Nomago: <https://www.nomago.si/avtobusne-vozovnice>
- LPP: <http://www.lpp.si/javni-prevoz/vozni-redi>

On one hand Bus station Ljubljana and Arriva provides service information such as bus timetables, pre-trip and on-trip information in English language. On the other hand we recognise shortages from the perspective of foreign tourists on web pages of Nomago and LPP. They provide passenger information mostly in Slovene language.

Furthermore, bus service operators Arriva and Nomago, offer bus service information also in free mobile apps named *Arriva.si* and *Nomago*. Both of them are developed for Android and iOS. The user interfaces of mentioned apps are shown in figures below.

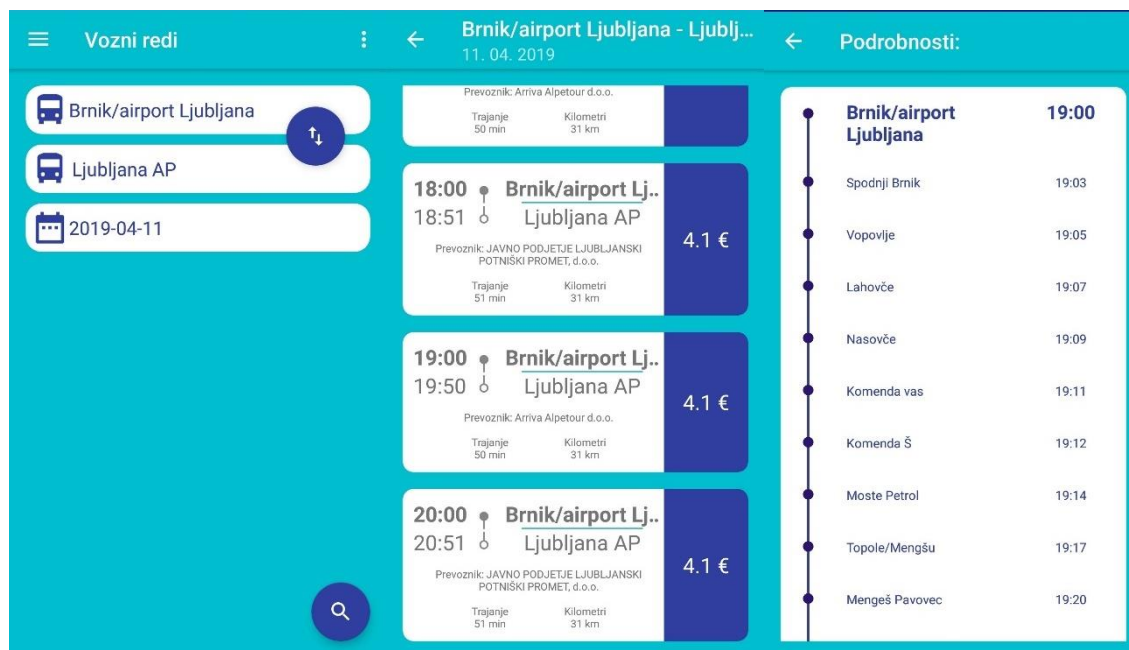


Figure 31: »Arriva.si« mobile app user interface. (Source: Arriva)

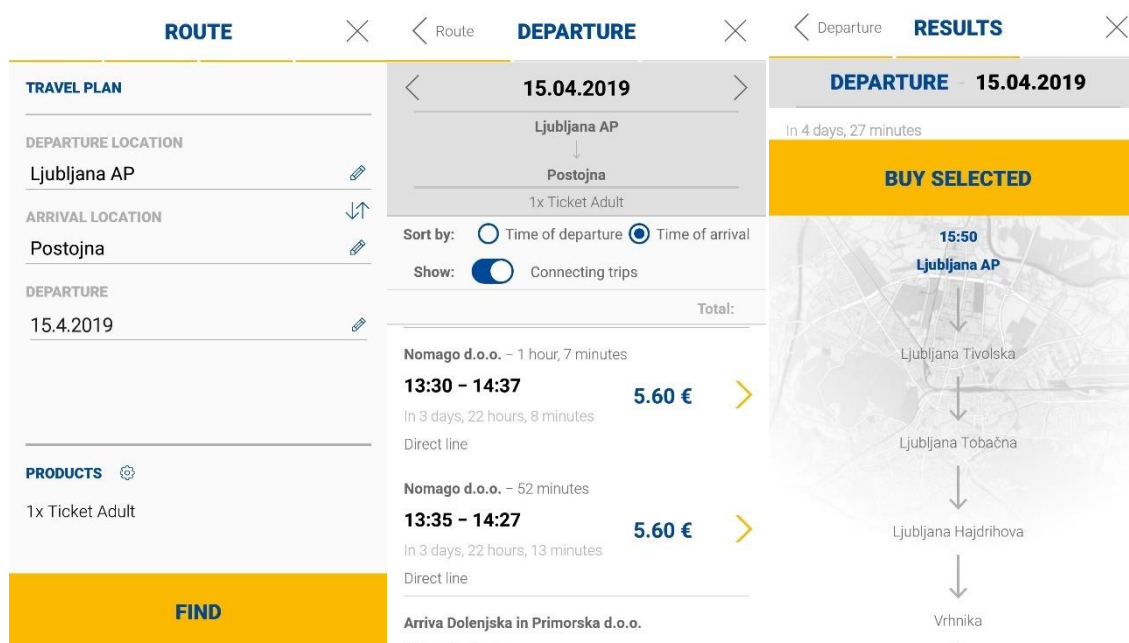


Figure 32: »Nomago« mobile app user interface. (Source: Nomago)

Shuttle service information in pilot area is only available online on web pages and mobile apps of service providers, that are developed for both Android and iOS:

- GoOpti App,
- Nomago.

4.2 Interconnectivity and language provision of timetable data among different modes of transport on hubs

In general, integration of public transport implies the opportunity to use the entire public transport system across the service area. Non-integrated public transport systems tend to neglect the needs of travellers, which results in a decrease of general ridership. In particular, the absence of integrated public transport system causes the problems and inconvenience for customers specially on informational level.

Existing integration among different modes of public transport in pilot area is insufficient. The customers face a non-transparent set of information that are only accessible at each service provider separately.

In 2017 the step forward to public transport integration at informational level in pilot area was done, taking into account the web based integration tool. By using the interface, travellers was able to access the information data via route planner including bus and train service. Furthermore, timetable for each bus and train station in pilot area was provided. The information data was provided in Slovene and English language. Unfortunately the integration toll is no longer active. The user interface is presented in figure below.

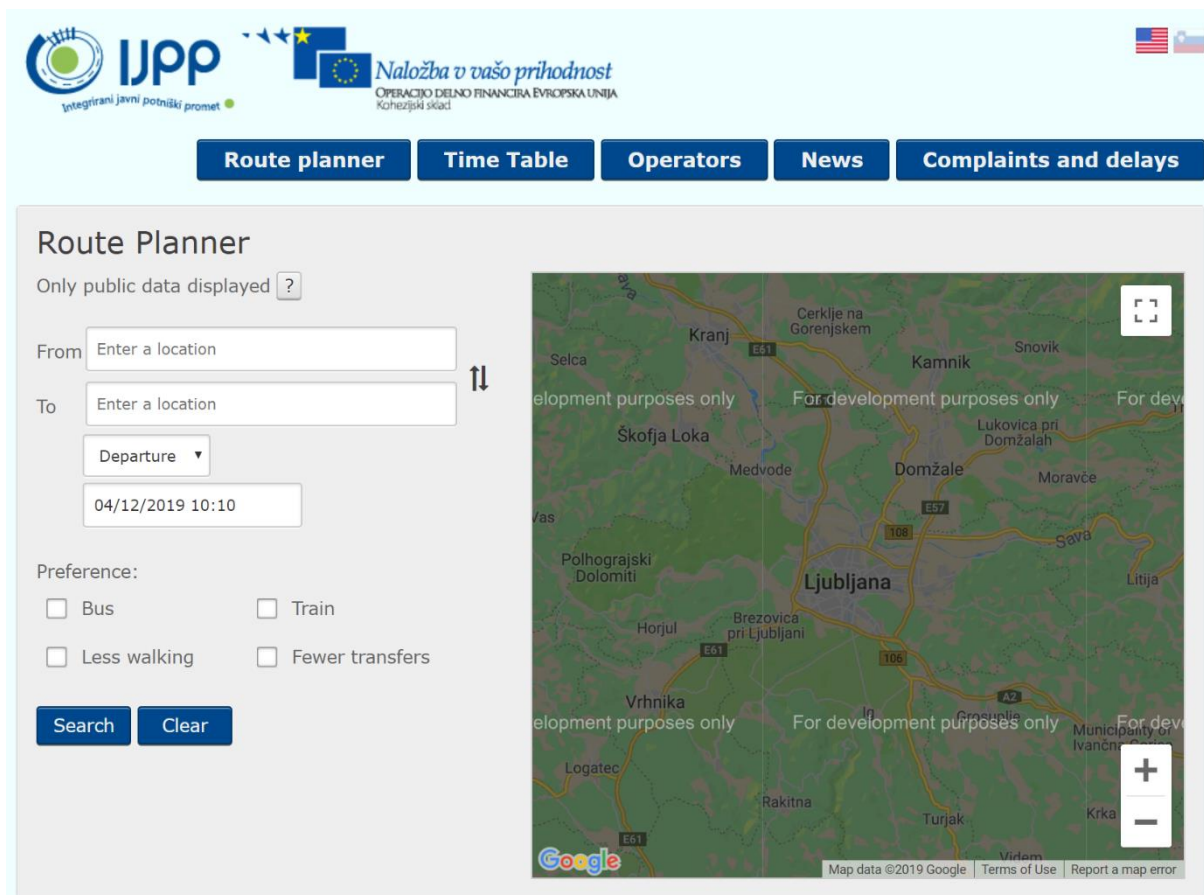


Figure 33: Integrated public transport web app user interface. (Source: www.ipp.si/en-us/)

5 FARES AND TICKETING SYSTEMS

5.1 Presentation on current tariff products and fares comparison for single/return tickets on different PT options suitable for tourists within defined pilot area

In pilot area there are several public transport tariff products available for tourists. First of all, tourists who visit Ljubljana there is the Ljubljana Card offered. There are also tariff products offering train transport such as Interrail and IZLETKA.

The Ljubljana Card is a combined ticket enabling visitors to explore the city in a comfortable way and at the lowest price. It is conceived as a smart card containing a RFID chip for card validation and free admission. The Ljubljana Card entitles to unlimited free public transport travel on city buses operated by the company Ljubljanski potniški promet (LPP) as well as additional services such as regular guided tour of the city, 24-hour access to WiFree Ljubljana, the city's wireless internet network, a free tourist boat cruise, and a free funicular to Ljubljana Castle etc. Taking transport perspective into account, The Ljubljana Card also includes free of charge bus transfer between the Ljubljana Central Bus Station and the Ljubljana Jože Pučnik Airport operated by the company LPP.

The Ljubljana Card offers the following benefits:

- free admission to 19 museums and galleries, the Ljubljana Zoo and several other attractions,
- a free guided city tour and free hire of a digital tour guide, which enables you to get to know Ljubljana on your own,
- free travel on city buses, unlimited during the card validity period,
- 24-hour access to WiFree Ljubljana, the city's wireless internet network,
- a funicular to Ljubljana Castle, a tourist boat cruise, and four-hour bicycle hire – all for free,
- free internet access at the Slovenian Tourist Information Centre (STIC).

There are three types of card available including following period of time: 24, 48 and 72 hours. The validation time begins from the moment when the card is activated, that is when it is used for the first time. Tourists are able to buy the Ljubljana Card online and save 10% off the regular price. Using the Ljubljana Card, travellers can save up to 165 € not just on entrance fee expenses but also on public transport fares in the city. Pricelist of the Ljubljana Card for adults and children is shown in table below.

Table 4: Ljubljana Card price scheme (Source: Turizem Ljubljana)

	Online price	Regular price
Adults		
24-hour card	27,90 €	31,00 €
48-hour card	35,10 €	39,00 €
72-hour card	40,50 €	45,00 €
Children aged 6–14 years		
24-hour card	16,20 €	18,00 €
48-hour card	20,70 €	23,00 €
72-hour card	24,30 €	27,00 €

From 1. June 2019 a brand new weekend and holidays train ticket named IZLETKA will be offered by the company Slovenske železnice. It is a flat rate ticket valid up to 5 days in row. Using IZLETKA, travellers will be able to travel on Saturdays, Sundays and holidays on the entire rail network in Slovenia, while it is not valid on work days. This ticket will substitute currently available Tourist weekend ticket, that provide 30% off the regular ticket price. The IZLETKA ticket costs 15,00 € for adults and 7,50 € for children from 6 to 12 years.

Last but not least tariff product suitable for tourists is the Interrail Pass. It is a train ticket that allows travellers to travel on almost all trains in Europe. With the Interrail Pass, travellers is able to get access to 37 railway and ferry companies in 30 countries in Europe. The Interrail Pass gives an access to more than 40.000 destinations while it works in the same way in each and every country.

There are several different Interrail passes available for traveling either global or just in one selected country. Having in mind Interrail Slovenia Pass, there are 5 different tariffs including 3, 4, 5, 6 or 8 days of traveling in one month on every line in country.

Table 5: Interrail Slovenia Pass tariff scheme. (Source: Interrail)

Validity	3 days within 1 month	4 days within 1 month	5 days within 1 month	6 days within 1 month	8 days within 1 month
Price	59,00 €	74,00 €	89,00 €	104,00 €	132,00 €

Currently in pilot area public transport ticket scheme does not include almost any benefits of return tickets compared to single tickets. Although it is possible to buy a return train ticket it costs as same as two single ones. The tariff scheme of regional bus fares is defined in the Regulation on a mode of implementation of economic public service on passenger public line transport in inner road transport and about the concession of this public service, where in appendix 2 the tariff scale is set in according to ride distance. For children aged from 4 to 10 years there is 50% off the regular price. The valid bus fare tariff scheme is shown in table below.

Table 6: Bus fare tariff scheme in pilot area.

Distance	Fare	Distance	Fare
[km]	[€]	[km]	[€]
0,00 – 5,00	1,30 €	90,00 – 95,00	8,70 €
5,00 – 10,00	1,80 €	95,00 – 100,00	9,20 €
10,00 – 15,00	2,30 €	100,00 – 105,00	9,60 €
15,00 – 20,00	2,70 €	105,00 – 110,00	9,90 €
20,00 – 25,00	3,10 €	110,00 – 115,00	10,30 €
25,00 – 30,00	3,60 €	115,00 – 120,00	10,70 €
30,00 – 35,00	4,10 €	120,00 – 125,00	11,10 €
35,00 – 40,00	4,70 €	125,00 – 130,00	11,40 €
40,00 – 45,00	5,20 €	130,00 – 135,00	11,60 €
45,00 – 50,00	5,60 €	135,00 – 140,00	12,00 €
50,00 – 55,00	6,00 €	140,00 – 145,00	12,40 €
55,00 – 60,00	6,30 €	145,00 – 150,00	12,80 €
60,00 – 65,00	6,70 €	150,00 – 160,00	13,60 €
65,00 – 70,00	6,90 €	160,00 – 170,00	14,40 €
70,00 – 75,00	7,20 €	170,00 – 180,00	15,20 €
75,00 – 80,00	7,50 €	180,00 – 190,00	16,00 €
80,00 – 85,00	7,90 €	190,00 – 200,00	16,80 €
85,00 – 90,00	8,30 €	more than 200,00	17,60 €

Public transport operators of rail and bus transport service in project corridor also include in their offer weekly, monthly or annual tickets. Prices of period tickets can easily be compared by the ratio between single ticket price and period ticket price. As far as bus service in pilot area is concerned, the ratio comparing single and weekly ticket is around 9 where the ratio comparing single and monthly ticket is around 33. The ratio comparing monthly and annually train ticket in project area is 8. Even though there exists period tickets of public transport this ticket types are only rarely appropriate for tourist.

Furthermore there are no benefits of buying return ticket instead of two single tickets for shuttle service in pilot area. Price scheme of shuttle service to and from Ljubljana Jože Pučnik Airport is presented in table 7.

Table 7: Shuttle service price scheme to and from Ljubljana Jože Pučnik Airport. (Source: GoOpti, Nomago)

From	To	Single ticket	Return ticket
Ljubljana	Ljubljana Jože Pučnik Airport	10,00 €	20,00 €
Koper	Ljubljana Jože Pučnik Airport	19,00 €	38,00 €
Postojna	Ljubljana Jože Pučnik Airport	19,00 €	38,00 €

Regular tourist bus service is organised to famous tourist attraction the Postojna Cave Park from Ljubljana Central Station and Koper. Bus fare price is included in entrance fee of each ticket valid for the park. The timetable of tourist bus is shown in table below.

Table 8: Tourist bus timetable from Ljubljana and Koper to the Postojna cave park. (Source: Postonjska jama)

POSTOJNA CAVE BUS STATION		
Bus Timetable		
	LJUBLJANA CENTRAL STATION – POSTOJNSKA JAMA	POSTOJNSKA JAMA – LJUBLJANA CENTRAL STATION
Sundays and holidays from 1. 9. to 30. 6. Saturdays, Sundays and holidays from 1. 7. to 31. 8.	08:00	14:33
Monday to Friday (working days)	8:15; 11:30; 12:00	13:46; 16:13
Sundays and holidays	13:30	14:13
Monday to Friday (working days) and Sundays and holidays		18:13
	KOPER – POSTOJNSKA JAMA	POSTOJNSKA JAMA – LJUBLJANA
Sundays and holidays from 1. 1. to 31. 12.	13:15	08:53

Moreover the Ljubljana Central Station special offer suitable for tourists is ticket for the Bled castle. Besides the castle tour that includes museum, restaurant, printing workshop, wine cellar, forge, knight's hall, chapel and the view to the Bled lake, the ticket includes also return bus transport between Ljubljana Central Station and Bled. Travelers can choose from hourly bus departures and additional half an hour bus departures in summer time from Ljubljana bus station and back. The pricelist is shown in table below.

Table 9: The pricelist of tourist ticket for the Bled Castle that include bus transfer between Ljubljana and Bled.

Bled Castle ticket	
Adults	11,00 €
Students	7,00 €
Children (up to 14 years)	5,00 €

5.2 Ticketing systems and payment method on different modes of transport within pilot area

Regional bus service tickets:

In pilot area public transport tickets for regional bus service can be purchased either at main bus stations or at bus driver on the bus. Regional bus tickets can also be purchased online on web shop accessible at: <https://www.ap-ljubljana.si/en/> or <https://vozovnice.nomago.si/si/nakup-vozovnice>. Furthermore, Nomago provides also a mobile app, where travellers are able to buy tickets and access to timetable and other information. Bus operator Arriva has a mobile app but online ticket shop is not provided.

The official web page of the Ljubljana Central Station enable the process of purchasing the ticket in Slovene or English language, while the bus ticket online shop of Nomago is available only in Slovene language. Mobile apps are available in Slovene or English language. Acceptable payment methods in online shops and mobile apps are credit cards (Mastercard, Visa) or PayPal.

Bus tickets bought on Nomago web page or in mobile app can simply be validated from the traveller's device at the bus driver, while online bought bus tickets on the Ljubljana Central Bus station web page has to be printed and given to the bus driver when entering the bus. From the user perspective this is not the most user friendly validation method.

Train tickets:

Using the train, tickets can be purchased either on train stations or where there are no station shops directly on the train. Additionally it is possible to buy single and return train tickets also online on web shop accessible at: <https://eshop.sz.si> or via mobile app *Go by train (Grem z vlakom)*, provided by Slovenske železnice.

The purchasing process is in Slovene and English language. Acceptable payment methods in web shops and mobile apps are credit cards (Mastercard, Maestro and Visa). E-tickets can simply be validated from the traveller's device by the train staff.

Shuttle service

Shuttle service in pilot area have to be pre booked and purchased either online on web pages (<https://shuttle.nomago.si/en/home> and <https://www.goopti.com/en/>) or by using the provider's mobile apps. The purchasing process is in Slovene and English language. Acceptable payment methods in web shops and mobile apps are credit cards (Mastercard, Maestro and Visa) and other payment method (PayPal and Discover).

Tourist tariff products:

The Ljubljana Card can be purchased at Ljubljana Tourist Information Centre (TIC) or in Slovenian Tourist Information Centre (STIC), both of them are located in the city centre and in most of hotels around the city. It is also available online on company web page of Turizem Ljubljana accessible at: <https://www.visitljubljana.com/en/visitors/ljubljana-card/>. Travellers who buy the card online receive a voucher that enable them to pick the card either at Ljubljana Jože Pučnik Airport or at Slovenian Tourist Information Centre. The official web page of Tourism Ljubljana enable the process of purchasing the card in several languages: Slovene, English, German, Italian, French, Russian and Spanish language. Acceptable payment methods in online shop are credit cards (Mastercard, Visa) and PayPal. While using the public transport the card has to be validated at the card readers that are located in the bus close to the entrance doors. Card benefits cannot be claimed after the expiration of the card validity period.

Train ticket IZLETKA can only be purchased in ticket centres in Ljubljana, Maribor, Koper and Celje, while the Interrail Slovenia Pass ticket is available online at web shop accessible at: <https://www.interrail.eu/en/interrail-passes/one-country-pass/slovenia>.

The Postojna Cave Park tickets can be purchase either at Ljubljana Central Station or online in web shop of the Ljubljana Central Station accessible at <https://www.ap-ljubljana.si/en/tourism/postojna-cave/> or directly at the web shop of Postojna Cave Park accessible at: <https://www.postojnska-jama.eu/sl/vstopnice/>. The bus ticket validation can only be done with voucher, when the travellers buy selected ticket for the Postojna Cave Park online in advance.

The Bled Castle tickets can be purchased at the Ljubljana Central Station or online on web shop accessible at: <https://www.ap-ljubljana.si/en/tourism/visit-bled/bled-castle/>.

5.3 Overview of current fare and ticketing integration among different modes of transport within pilot area

Currently there are no ticket integration among different modes of transport within pilot area. Every public transport ticket in public area includes just one single transport mode. Even in case when the same line is operated by several transport operators, the ticket is valid only for transfer by operator who sold the ticket. The measures of improvement to provide better integration are explained in chapter 8.

6 TRANSPORT AGREEMENTS AMONG PT OPERATORS IN PILOT AREA

6.1 Provision of agreements among existing PT operators and other parties involved in transport for touristic purposes within pilot area

By the public available data as well as information by the PT operators there are currently no agreements among PT operators in pilot area.

At this point an example of interregional cooperation between PT operators have to be mentioned. Since 1st March 2019 the Slovenske železnice together with Trieste transporti from Italy cooperate on try-out of service integration in corridor Ljubljana and Trieste that include train and bus transport. The partnership on this corridor was developed within the framework of the European project CONNECT2CE, INTERREG Central Europe.

7 LEGAL AND REGULATORY ASPECTS OF TRANSPORT IN PILOT AREA

7.1 Regulations and regulatory institutions involved in PT provision in pilot area

In order to provide legal and regulatory aspect of public transport in pilot area, the key regulatory institutions have to be presented. It is operated as local, regional and international regular passenger services. Public transport on international level is regulated by the Council of the European Union while each Member State has on national level its own regulation where there the regulatory powers for regional services are at national government and ministry for transport and for local public transport at each municipality.

Regulations of public transport in pilot area are included in following acts:

- Regulation (EC) No 1370/2007 of the European Parliament and of the Council of 23 October 2007 on public passenger transport services by rail and by road and repealing Council Regulations (EEC) Nos 1191/69 and 1107/70
- Regulation (EC) No 1073/2009 of the European Parliament and of the Council of 21 October 2009 on common rules for access to the international market for coach and bus services, and amending Regulation (EC) No 561/2006,
- Services of General Economic Interest Act: Zakon o gospodarskih javnih službah: (Uradni list RS, št. 32/93, 30/98 – ZZLPPO, 127/06 – ZJZP, 38/10 – ZUKN in 57/11 – ORZGJS40)
- Regulation on a mode of implementation of economic public service on passenger public line transport in inner road transport and about the concession of this public service: *Uredba o načinu izvajanja gospodarske javne službe javni linijski prevoz potnikov v notranjem cestnem prometu in o koncesiji te javne službe (Uradni list RS, št. 73/09),*
- Decree on the mode of providing public service obligations in inland and cross border regional railway passenger transport: *Uredba o načinu izvajanja obvezne gospodarske javne službe prevoza potnikov v notranjem in čezmejnem regijskem železniškem prometu (Uradni list RS, št. 99/08).*

Public regular passenger service is considered to be a transportation carried out on certain routes or lines according to a predetermined timetable and priced in general conditions of carriage. The regulatory framework proposed by the government and municipalities for the provision of the public transport services in Slovenia is the concession model. Under this model governmental authorities define the public transport service to be provided and invite tenders for its provision.

Concession contracts are awarded to the winning tenderer who gain an exclusive right to operate service on particular routes or in defined geographical areas for a specific period of three years with extension possibilities. The winning tenderer either makes a payment to the state to operate the exclusive specified bus or rail services or receives a subsidy.

With the concession contract the grantor and the concessionaire determine relations to the performance of the concessionary services of general economic interest in particular:

- method and deadlines for payment and securities,
- relations to the assets deposited by the grantor,
- concessionaires obligation to report the grantor on all the facts that may affect the performance of the public service under the conditions set in the concession act,
- method of financial and professional supervision by the awarding authority,
- penalties for absent or inappropriate service performance,
- obligations and relations regarding to damages caused by service performance,
- obligations and relations under changed and unpredictable circumstances,
- manners of concession contract changing methods,
- concession contract termination and extension possibilities,
- facility transfer, concession redemption and possible restitution in case of termination of the concession.

Concession areas are formed as groups or packets of lines and in exceptional cases, concessions may also be granted for a particular line or departure on such line. Concession areas are presented in figure below.

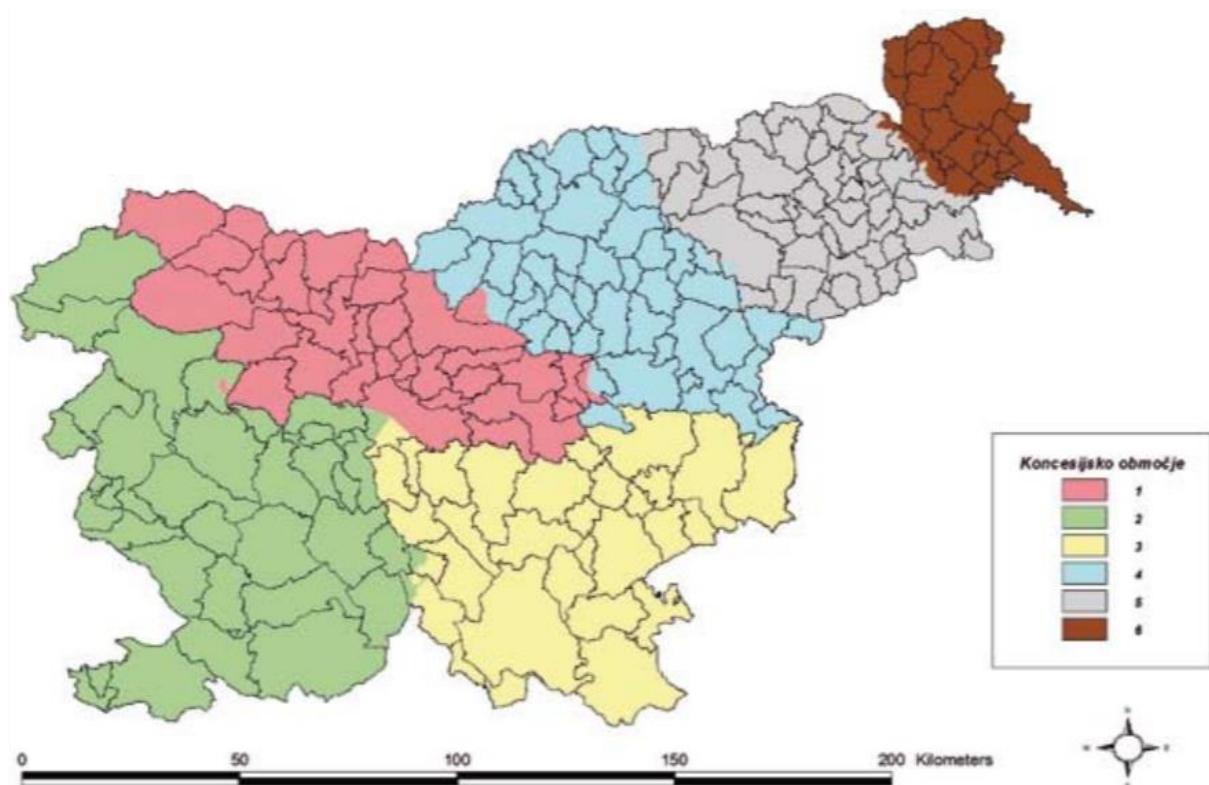


Figure 34: Concession areas of public transport service in Slovenia. (Source: Uradni list RS, št. 73/09 Priloga 1)

According to the rail public transport operation in Slovenia the exclusive right of running the services of general economic interest of the public passenger transport in the internal and cross border regional railway traffic is awarded to the company Slovenske železnice. It is determined by Article 27 of the Railway Transport Act (Uradni list RS, št. 44/07). The duration of the contract for the rail public

transport performance is limited and is no longer than ten years and can possibly be extended by up to half the duration of the contract.

Regular road public transport is carried out by buses, what encompasses vehicles intended for the carriage of passengers and have in addition to the driver, more than eight seats. Urban public regular transport is considered to be the transport of passengers within the settlement or settlements organized as a public service by the municipality. Long distance public transport is the public transport of passengers between two or more municipalities in region. International public regular transport is the public transport of passengers between Slovenia and other countries.

Public passenger transport services in European Union are governed by Regulation (EC) No 1370/2007. This regulation aims at providing guidance on how competent authorities may act in the field of public passenger transport to guarantee the provision of this service of general interest. It also regulates how public procurement should be organised.

Since December 2011, the international carriage of passengers by coach and bus in European Union is governed by Regulation (EC) No 1073/2009. This regulation replaces two regulation on field public transport legislation, Regulation (EEC) 684/92 and Regulation (EC) No 12/98. The latest regulation makes the rules clear and less complex, improves enforcement and avoids unnecessary administrative burden.

In December 2010, the European Parliament and Council reached an agreement on the rights of passengers travelling by bus and coach. A set of basic passenger rights including non-discrimination, adequate information to passengers, in particular those with reduced mobility, apply to all passengers. Additional rights on assistance, accommodation, compensation, etc. have to be granted to passengers travelling long distances, what considers for trips longer than 250 km.

The international carriage of passengers by coach and bus is conditional on the possession of a community licence. Any road passenger transport operator possessing a valid Community licence, issued by each Member State of establishment, has by the law free access to the whole international EU road transport market.

The Community licence is issued by the designated competent authority in each Member State provided that the carrier:

- is authorised to undertake carriage in the Member State of establishment,
- satisfies the conditions laid down in EU rules on access to the profession,
- meets legal requirements regarding the standards of drivers and vehicles.

The Regulation defines the different types of coach and bus service and the specific requirements they must fulfil to access the market:

- regular services, which require a national authorisation issued by a competent authority,

- special regular services (e.g. organised transport of employees or pupils), which shall not require a national authorisation, if covered by a contract between the organiser and the transport operator,
- occasional services (e.g. the transport of a group of people on field trip, concert, tourist trip ... in another Member State), which only require a journey form,
- own-account transport, meaning transport which is not for hire or reward, and related authorisations and rules, which are exempt of the authorisation system, but require a certificate issued by the Member State in which the vehicle is registered.

Important aspect of international public transport is cabotage operations where national passenger transport operations are carried out by non-resident operators are also restricted by Regulation (EC) 1073/2009. It specifies that any carrier who operates road passenger transport services and who holds Community licence can operate cabotage operations for the following services when special regular services, covered by a contract between the organiser and the carrier, occasional services and regular services, in the course of a regular international service.

7.2 Analysis of regulations taking place for transport operation in case study area

Providing the public transport service in case study area the regulations of market access, minimal operating services and service requirement has to be obtained.

As the rail public transport is exclusively awarded to company Slovenske železnice, it is the only operator that run the service on all lines in study area. In 2017, the government adopted a decision to sign the contract on the implementation of the services of general economic interest in the internal and cross-border regional rail transport for the period 2017-2031. In according to the contract they have to provide the operating fleet, the material resources necessary for running the transport and provision of additional services that are directly related to the transport such as ticket sale, information system, etc. Service provider is obliged to ensure the scope of services in the internal and cross-border regional rail passenger transport in accordance with the adopted timetable, with the volume of services rendered expressed by the number of train kilometres.

The road public transport service in pilot area is run by several providers, that are concession holders. The number of departures for each line and the direction within the individual time frames and intervals is determined by the Slovenian infrastructure agency with the Decision determining indicative timetable. In appendix 1C of Regulation on a mode of implementation of economic public service on passenger public line transport in inner road transport and about the concession of this public service the accessibility standard is specified. In table below the number of departures per settlement class and time frame per week day is presented. In order to ensure accessibility, the following scheme is used according to the class of the settlement named as A, B, C, D, E and GT, where:

- Class A - a municipal centre with more than 1,000 potential passengers.
- Class B - a municipal centre with 500 to 1000 potential passengers.

- Class C - a settlement, which is a municipal centre and has between 200 and 500 potential passengers and all settlements, which are not municipal centres and have more than 2000 inhabitants.
- Class D - settlements that are municipal centres have less than 200 potential passengers and all settlements, which are not municipal centres, have more than 1000 inhabitants.
- Class E - settlements, which are not municipal centres, have between 500 and 1000 inhabitants and have regular bus and passenger transportation.
- Class GT - Generators of tourism.

Table 10: Number of departures per settlement class and time frame in inner road transport. (Source: Uradni list RS, št. 73/09)

Class	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	21	21	22	23
A	13				6				13				9						
B	7				3				7				4						
C	4				1				4				2						
D	3				1				3				2						
E	2				1				2				1						
GT	3																		

Project corridor is included in concession areas 1 and 2. Based on Appendix 1B of Regulation on a mode of implementation of economic public service on passenger public line transport in inner road transport and about the concession of this public service, the following lines are included in pilot area connecting main transport hub.

Table 11: Regular bus line connecting main transport hubs in pilot area. (Source: Uradni list RS, št. 73/09)

Line	Line name	Line route	Min. departures per day
121	Ljubljana–Cerklje na Gorenjskem	Ljubljana–Trzin–Mengeš–Komenda–Letališče Jožeta Pučnika	16
226	Koper–Postojna	Koper–Kozina–Divača–Postojna	8
236	Nova Gorica–Ljubljana	Nova Gorica–Postojna–Ljubljana	8
238	Koper–Ljubljana	Koper–Postojna–Ljubljana	8

8 LIST OF SHORT- AND LONG-TERM MEASURES FOR IMPROVEMENT OF TOURISTIC PT IN PILOT AREA

8.1 List of short- and long-term measures for infrastructure and service improvement of connection from maritime areas and Ljubljana Airport to Ljubljana urban region

The most important improvements of service and infrastructure connection in pilot area was implemented during this project time by the national authorities – Ministry of Infrastructure. Since the 1st June 2019 the fast and direct bus lines connecting most important cities in Slovenia that enable better service specially for commuting as well as in tourist purpose. New bus lines, that connecting cities in pilot area, are:

- bus line between Ljubljana and Postojna on working days from Monday to Friday,
- bus line between Ljubljana and Koper on working days from Monday to Friday and
- bus line between Ljubljana and Bled with stop at the Ljubljana Jože Pučnik Airport running every day of the week.

Besides new bus lines there also exist significant potential from the perspective of travel demand using additional services included in public transport in touristic purpose. Regarding to relatively unstable and rarely predictable travel demand in region, where strong expansion of tourism is occurring, we recommend the implementation services in field of on-demand transport. This type of transport is specially viable for connecting the train and bus stations with touristic point of interests where there not exist any frequent public transport connection. In pilot area included in the project we recognise opportunity for this type of service in Postojna where there is no connection between train and bus station and Postojna caves. This measure will expand the importance of public transport for intermittent travellers which in current state are more or less considered as captive drivers.

Measures for infrastructure and service improvement in pilot area are collected in table below.

Table 12: Measures for infrastructure and service improvement

<u>Proposed measure</u>	<u>Proposed timeframe of implementation</u>	<u>Financial frame</u>	<u>Actor</u>
Fast direct bus lines following demand tendencies connecting most important regional centres: Kranj - Brnik - Ljubljana, Ljubljana - Postojna - Koper.	Ongoing.	Demanding.	Ministry of Infrastructure, public transport operators.

On-demand transport service as add on transport solution to existing public transport service from existing public transport hubs to most important tourist attractions (Postojna train station - Postojna bus station - Postojna cave).	Continually.	Demanding.	Ministry of Infrastructure, municipalities, regional development agencies, public transport operators.
Renovation and modernization of public transport stations (bus and train) with accessible, safe and comfortable shelters.	Short term.	Demanding.	Ministry of Infrastructure, municipalities.
Modernization, renovation and upgrade of rail network including introduction of new line routes and passenger regional train sets.	Long term. / Ongoing.	Very demanding.	Slovenian Railways, Ministry of Infrastructure.

8.2 List of short- and long-term measures for improvement of info-mobility and passenger information service (on-board, at interchanges) for tourists

On the field of info-mobility and passengers information service the current conditions fulfil most of passenger needs. Moreover there are not recognised any significant shortcomings in pilot area. In general the implementation of multilingual information service for public transport specially for timetables on train and bus stations is recommended. Furthermore we recommend the upgrade of informational boards on train and bus station with live arrival and departure boards.

Measures for infrastructure and service improvement in pilot area are collected in table below.

Table 13: Measures for info-mobility and passenger information service for tourists.

<u>Proposed measure</u>	<u>Proposed timeframe of implementation</u>	<u>Financial frame</u>	<u>Actor</u>
Introduction of multilingual public transport service passenger information on all info points, web pages and mobile apps.	Short term.	Less demanding.	Public transport operators and providers.
Introduction of info boards on train and bus station with live arrival and departure boards.	Short term.	Demanding.	Ministry of Infrastructure, public transport operators.
Re-establishment of integrated public transport web and/or mobile app user interface.	Short term.	Demanding.	Ministry of Infrastructure.
Establishment of public transport info point in Ljubljana Jože Pučnik Airport.	Short term.	Demanding.	Ministry of Infrastructure, Ljubljana Jože Pučnik Airport.

8.3 List of short- and long-term measures for improvement on fare integration and integrated ticketing systems among transport operators in pilot area

The importance of measures on field of fare integration and integrated ticketing systems is to improve the simplicity of public transport and touristic packages offered in pilot area. Ease of use is recognised as one of the most important decision making factor. Improvement on this field is possible for Ljubljana Card. First of all it is possible to get the tickets only at the Ljubljana Jože Pučnik Airport and in the Touristic office in the centre of Ljubljana. Regarding to the purchasing process and ticket using we recommend the implementation of e-Ljubljana Card. From the perspective of tourists it is easily to buy this type of cards in advance and use it on a smart phone.

On regional level it is also considered to be improvement of public transport service integration in case of establishing touristic packages, which includes tickets for touristic attractions and tickets for public transport, as it is already done in Ljubljana.

Furthermore we recommend the implementation of additional payment methods for covering public transport fares. It is becoming more and more popular to use credit cards and also paying with

smartphones. This measure will increase the easiness of use specially for intermittent travellers instead of proceeding registrations for purchasing e-ticket or even buying tickets on traveller service offices.

Measures for improvement on fare integration and integrated ticketing systems among transport operators are collected in table below.

Table 14: Measures for fare integration and integrated ticketing systems among transport operators.

<u>Proposed measure</u>	<u>Proposed timeframe of implementation</u>	<u>Financial frame</u>	<u>Actor</u>
Introduction of various touristic packages, that includes tickets for all modes of public transport in pilot area and tickets for tourist attractions. (Ljubljana card, Slovenia card, Nature Slovenia card, Gastronomy Slovenia card ...)	Short term.	Less demanding.	Ministry of Infrastructure, Public transport operators and providers, regional development agencies, Slovenian tourist board.
Introduction of a single integrated ticket for all modes of transport in pilot area.	Short term.	Less demanding.	Ministry of Infrastructure, Public transport operators and providers.
Introduction of various payment methods for all mode of public transport: e-tickets, paying with credit cards or smart phones.	Short term.	Less demanding.	Ministry of Infrastructure, Public transport operators and providers.

8.4 List of short- and long-term measures on organisational and regulation aspects to improve public transport operation and interconnectivity study area.

Measures on organisational and regulation aspects have to be first of all done on the field of establishing the regional public transport operator that will be able to efficiently coordinate as well as stimulate interconnectivity between different transport service companies.

The regulatory aspect improvement of public transport operation in pilot area needs to be done on the fare distribution between different transport service companies that run the same line. From the perspective of travellers it should not be important which company run the service if they has valid ticket.

Measures for infrastructure and service improvement in pilot area are collected in table below.

Table 15: Measures for info-mobility and passenger information service for tourists.

<u>Proposed measure</u>	<u>Proposed timeframe of implementation</u>	<u>Financial frame</u>	<u>Actor</u>
Coordination of public transport timetable for all modes of transport according to the existing travel demand.	Short term.	Less demanding.	Ministry of Infrastructure, Public transport operators and providers.
Reformulation of concession areas and frequencies of the public transport services for settlement class GT (Tourism).	Short term.	Demanding.	Ministry of Infrastructure.
Encourage, promote and educate about the benefits of using public transport.	Short term.	Less demanding.	Ministry of Infrastructure, Public transport operators and providers.

9 SUMMARY

In project the conditions of public transport service in pilot area including the Ljubljana Jože Pučnik Airport, city of Ljubljana, city of Postojna and city of Koper with its cruise port are analysed.

The area is recognised as very irregularly developed from the perspective of transport comparing private and public transport conditions. In according to unbalanced development of transport infrastructure, where roads and other facilities for private transport were dominate, the shortcomings at public transport are easily recognised. The findings so far lead the project to research the opportunities for public transport improvements implementing both hard and soft measures.

Moreover the pilot area has also a strong touristic potential. In last decade it attracts every year more and more tourists what result in generation of significant share of additional trips that enlarge the total traffic load. Take this data into account added to every day travel patterns the public transport in region claims to be improved on several levels; infrastructural, informational, integrational and organisational.

During the project we found out that bus service is well consistently dispersed in the area. The same is valid for rail public transport service, where the potential for further development still remain to be fulfilled. The present condition of train and bus stops has to be upgraded in order to attract more travellers. Especially this is important in centres of regional significance and the most important economic areas and transport nodes in pilot area, where public transport terminals has to be established and integrated to become multimodal transport hubs. At the informational level the public transport have to be organised oriented to travellers needs while the fare system has to follow the benefits of service flexibility. Transport service companies have to be stimulate to include in their tariffs scheme more diverse ticketing offer what enable more adjustable ticketing plan for travellers. Moreover the information and ticketing has to be accessible on mobile apps or web platforms as this has become most common accepted business to customer concept in digital age in other field of operation. The public transport authorities have to enable conditions for timetable integration of the service among different operators.

In order to follow the strategies of sustainable public transport and transit oriented development in urban planning we propose short and long term measures for improvement focusing on the public transport. First of all public transport has to follow the needs of end users and follow the trends of mobility conditions of private transport. The diversity as well as coordination of public transport modes offer has not to be neglect.

The highest potential in last period in the field of public transport is given to demand responsive services including taxis and shuttle service. It provide opportunity to collect travellers on first and last miles of trips and raise the effectiveness and competitiveness of public transport system by connecting transport hubs and collecting the travellers. To sum up this study we conclude with the recommendation for further development and implementation of on demand transport service in observed study area.

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