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TRANSNATIONAL SUMMARY REPORT ON CURRENT MOBILITY AND TRANSPORT POLICY IN CE REGIONS

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Contents

1. Executive summary

The following document summarizes a transnational report on current mobility and transport policy in Central Europe (CE) regions. The report makes an investigation which follows an identical structure. First, an introduction is provided by focusing on social and economic aspects which mainly affect the local transportation. Then the transport system itself is described together with the relevant governance structure and legal obligations. Existing strategies for mobility plans and innovative transport solutions are also investigated. Finally, the main visions and goals are summarized which concern the near future of the local transportation. The descriptions are helpful for several target groups, including local and regional authorities and NGOs, which are situated in one of the included region.

In nutshell the following results can be summarized:

- Policy and legal obligations for transportation are similar in all investigated regions of CE.
- The regions are heterogeneous regarding to the existing strategies (some of them have sustainable solutions long times ago, others only created sustainable mobility plans in paper).
- The notion of workplace mobility plan is generally not known and the stakeholder actors have not yet identified its importance.
- In conclusion, it is obvious that the workplace mobility plans are highly missing factors in CE regions.

2. Introduction

MOVECIT - Engaging employers from public bodies in establishing sustainable mobility and mobility planning – started in June 2016 and is a 36 months project supported by the INTERREG Central Europe programme.

MOVECIT aims to make transport more sustainable in times of increasing individual and motorised mobility in central Europe. City representatives, sustainable mobility specialists, environmental and regional agencies as well as NGOs cooperate in the project. City administrations will implement mobility plans for their institutions to change the commuting and business travel habits of their employees. Campaigns will be developed and launched to make cycling, walking, and the use of public transport more popular. At the same time measures like carsharing, bikesharing, e-mobility and improved carpools of city town halls will be introduced in selected cities.

The project seeks to reach a wide audience among municipalities across the Central Europe region, creating a large-scale impact, and in the longterm ongoing training on mobility plan development. In order to achieve this, MOVECIT creates and implements its training transferred to national environment and two Study visits and exploits its outputs for a long-term impact.

Through MOVECIT project selected cities will benefit from mobility plan created for city hall administration. Project partners appointed as know-how provider will work intensely with the municipalities appointed as know-how receiver. In the stakeholder involvement process several events will be organized to reach the wider acceptance of the plans. The pilot actions and pilot investments will be implemented to test the commitment of the staff employed at the municipality administration.

Communication and promotion activities will target more or less the staff working at the municipality administration. Trendy campaign will influence on heart and mind of the target groups.

3. Synthesis of the regions report

The investigation of the summary report covers the following regions/city-regions (see figure below):

- Industrieviertel (Lower Austria)
- Cityregion Bruck-Kapfenberg-Leoben (Austria)
- Budapest (Hungary)
- Békéscsaba (Hungary)
- Banská Bystrica (Slovakia)
- Modena (Italy)
- Ústecký Region (Czech Republic)
- Slovenia
- City and urban hinterland of Leipzig

Figure 1 The investigated CE city-regions

Industrieviertel of Lower Austria and the city-region Bruck-Kapfenberg-Leoben (Austria) are similarly developed, totally multifaceted (agricultural areas/vineyards on the one hand as well as industrial areas on the other hand). Budapest represents a huge metropolitan area representing an economic and political center, being the largest metropolitan area in Central Eastern Europe. Modena as generally the Northern Italian regions is characterized by strong settlement diffusion which corresponds to a high density of infrastructures and mobility services. The rest of the city-regions considered represent similar fashion considering economic measures and transportation development level.

The governance structure and legal obligations for transportation are similar in all investigated regions of CE. Municipalities and/or the state (federal state) are the responsible organizations for providing appropriate public transport service. This is typically ensured by specific state law or regulation. The only differences can be observed concerning the responsibility distribution. This means that state and

municipality can be jointly or separately responsible for transportation infrastructure and services. Responsibility is differentiated by area (e.g. public transport in town is typically organized by the municipality) or the transportation modes (e.g. typically railway transportation is ensured by state as state railway).

Concerning the existing strategies it is observable that Austrian and German regions long times ago prefer and support the wide spread green and sustainable solutions and technologies for transportation. Their aim is to improve e-mobility by car sharing systems and improve accessibility of e-mobility, increase the number of high-quality parking spaces for bicycles and develop comprehensive mobility concepts. Beside the Austrian and German regions only Hungary has concrete concept for electro-mobility called Ányos Jedlik Plan (research, development and innovation for supporting the spread of electro-mobility). On the other hand, Sustainable Urban Mobility Plans (SUMP) or simple transport development plans are already carried out or under development in all regions of CE. In these concepts the current transport situation, the reveal of the problems and the proposals to solve them, the concrete short-, medium- and long term aims and the tasks for achieving them are collected and summarized.

Concerning the workplace mobility plan, it is observable that this notion is generally not known and the stakeholder actors have not yet identified its importance and meaning. With the exception of the Italian city-region Modena, none of the regions (investigated in this summary) have started devising workplace mobility plan. Modena is in a fortunate situation due to a national regulation, i.e. the Italian National law (D.M. del 27/03/1998 of the Minister for Environment) specifies that public companies and public entities, with individual local units of more than 300 employees, and companies with more than 800 employees, located in municipal areas at risk of air pollution, have to adopt a Plan for home-work trips for their workers, therefore identifying a manager responsible for company mobility. This foresees that workplace mobility plans will be established soon in Modena region.

The visions and goals for transportation in CE regions are mostly similar. The regions plan to follow the already defined Sustainable Urban Mobility Plans (SUMP) or transport development plans in short and medium term time horizons. Main goals consist of: promotion and facilitation of cycling and foot traffic; parking facilities; public transport systems; electro-mobility and smart mobility technologies. Basically, the increase of attractivity and competitiveness of public transport is also a common project for all regions.

In conclusion, it is obvious that the workplace mobility plans are highly missing factors in CE regions. The meaning of workplace mobility plan needs advertising and dispersing generally.

4. Industrieviertel (Austria)

4.1. Introduction to the region

This report focuses on “Industrieviertel” in Lower Austria. The region covers an area of about 4.200 km² representing 21,8% of Lower Austria. Lower Austria is located in the north/east of Austria and consists of five regions. “Industrieviertel” is one of these five main regions. It is located in the south of Vienna. The cities Baden and Mödling are main drivers for the growth of this region and are responsible for the maintaining development of it. Suburbanization plays a vital role. For that reason the population is increasing due to the growing number of people moving from Vienna to rural areas near the capital. The region covers the area of the rural boroughs of Bruck/Leitha, Schwechat, Mödling, Baden, Wiener Neustadt Stadt, Wiener Neustadt Land and Neunkirchen. The region is totally multifaceted and contrasting with its agricultural areas and vineyards on the one hand as well as industrial areas on the other hand. Especially near the so called Thermenlinie (thermal line) many industrial centers emerged which also contributed to the increasing importance of this area - not only economically but also socially. The

demographic forecast of the town and country planning conference in 2009 [2] suggests that the population of the southern hinterland of Vienna will increase from 316.000 citizens in 2009 to approx. 430.000 in 2050 [1], [2].

Due to the phenomenon of suburbanization the population will grow in the region [7]. The total population of the region increased to 619.810 in the year 2014. Comparing the population of 2004 and 2014, a growth of 6,9% can be observed. A forecast for 2030 suggests that the population will continue to grow by 16% compared to the year 2009 [7]. The following tables show the development of the population and age distribution for the cities of Baden and Mödling.

Table 1 Population of Baden and Mödling [3]

	1951	1971	1991	2001	2011
Baden	21312	22727	23488	24502	25093
Mödling	17076	18835	20290	20405	20411

Figure 2 Austria; "Industrieviertel" in orange [1]

City of Baden

By the end of 2010, Baden had 25.180 inhabitants (principal residents) and 4.345 secondary residents. 54% of the residents were female and 46% were male. Population density is slightly above 900 inhabitants per sqkm. According to the demographic forecast, population of the district of Baden is expected to increase by 27% from 200 1to 2031. The number of people aged 65 or more years are predicted to double while the amount of people younger than 65 will increase by only 15%. In 2001, Baden had 14.328 flats, situated in 5.504 building. [3, 4]

Table 2 Age distribution of the population of Baden [3]

	0-4	5-9	10-14	15-19	20-24	25-29	30-39	40-49	50-59	60-69	70-79	80-89	90-95
2012	1040	1179	1144	1266	1370	1270	2912	3940	3416	3288	2584	1405	215
2015	1046	1131	1190	1214	1312	1304	2870	3817	3744	3025	3023	1328	287

Table 2 indicates that Baden can be seen as an ageing municipality. The portion of people over 64 years is pretty high compared to the ones of employable age (15 - 64 years) [4].

City of Mödling

As indicated in Table 1, the city of Mödling has undergone a significant growth. Compared to Baden, the age distribution is more balanced. There is a higher number of people at employable age compared to non-employable age (over 70).

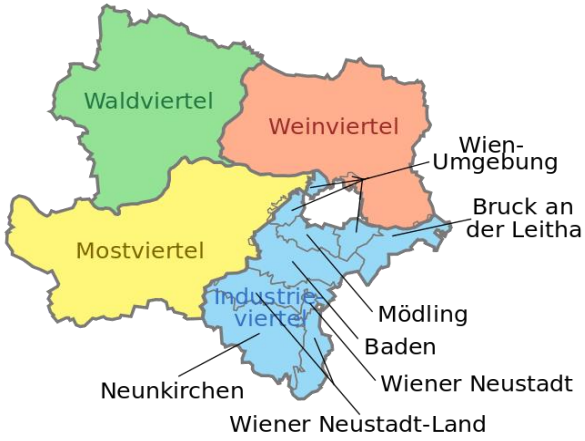


Figure 3 Photo from "Industrieviertel" [6]; Regions of Lower Austria ("Industrieviertel" with its municipalities)

The regional unemployment rate constituted 21.450 persons in 2014. The number of unemployed people has increased by in 2014 1,6% compared to 2013. The growth of the unemployment rate could be positively correlated with the growing number of elderly people reaching non-employable age. Nevertheless, according to statistics the employment rate will also increase by 0,5% [7].

Table 3 Age distribution of the population of Mödling [3]

	0-4	5-9	10-14	15-19	20-24	25-29	30-39	40-49	50-59	60-69	70-79	80-89	90-95	>95
2012	973	990	974	1109	1106	1175	2600	3573	2583	2479	1745	939	137	51
2015	921	977	985	1117	1104	1193	2600	3426	2880	2270	2060	867	184	41

4.2. Description of the transport system

The following data is used from Arbeiterkammer NÖ and defines commuters as employed persons who do not have their work place and living place in the same district. The region “Industrieviertel” has a high number of commuters [7].

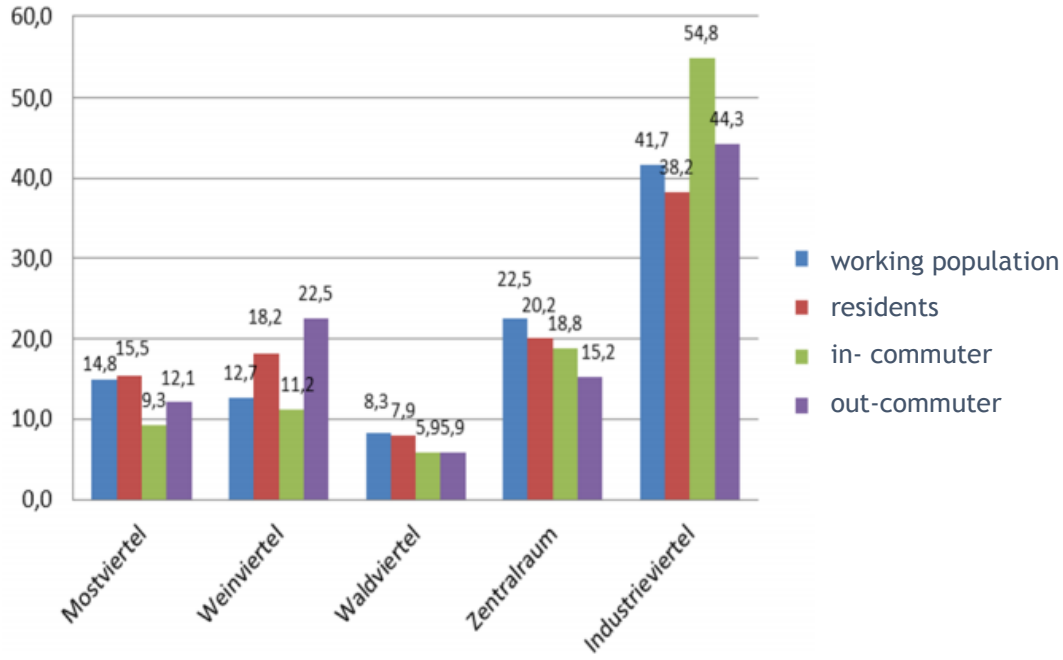


Figure 4 Commuters in percentages in 2014 [7]

According to Arbeiterkammer NÖ, one out of two persons living in Lower Austria commutes to work. Therefore, municipalities need to provide more investments in order to support PT users and improve the PT [8].

Statistics show that in-commuters as well as out-commuters increased by 6,7% in 2014 compared to 2009. However, the balance of commuters is negative, which means that there is a higher number of out-commuters than in-commuters [7].

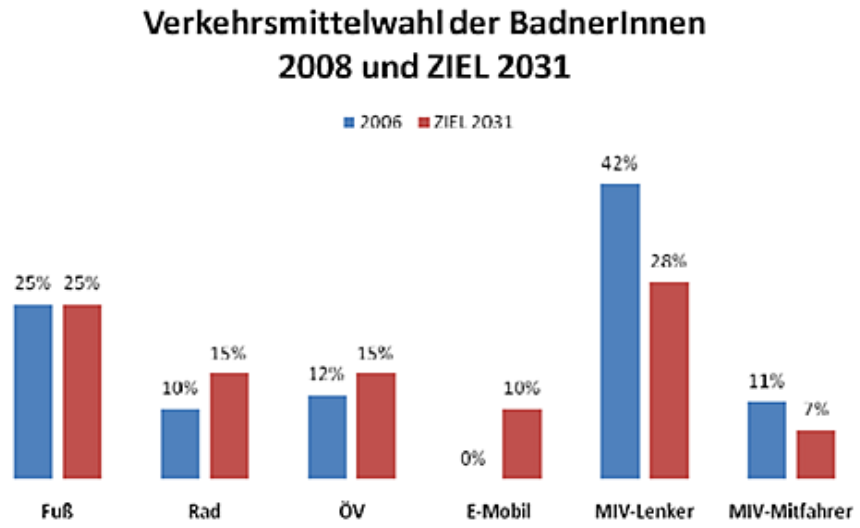


Figure 5 Modal Split in Baden [17]

With the 'Badner Bahn' and the 'Südbahn' Baden is well connected to the Cities of Vienna and Wiener Neustadt. Baden also runs its own bus network ("City-Bus"). An important precondition for public transportation is the rather dense settlement structure in Baden. As a result of the high share of commuting inhabitants, car traffic mainly consists of originating and terminating traffic, only a minor share is so called through traffic. While through traffic decreased in the past decade, originating and

terminating traffic increased significantly. For the demand of alternative fuels for car-traffic, there is a public petrol station providing natural gas and one providing bio-diesel. Additionally, Baden has a well-established and dense cycle path network. Modal split of Baden can be characterized as well balanced with a potential to reduce individual car traffic.

Furthermore there is an 'Opernbus' which connects the opera of Vienna and the city of Baden. Another possibility for travelling during night time is the night bus. The following PT operators can be found in Baden: Wiener Lokalbahnen AG (Badener Bahn, Citybus, Opernbus, Stadtverkehr ...), Nachtbus Baden, ÖBB (Südbahn), Wiener Linien and the Postbus.

There is a total network of 150 km of roads in Baden. It consists of the main country roads as well as municipal roads [10].

The city of Baden increases investments in its cycling network in order to establish an excellent connection to neighboring municipalities. This will not only result in an increase in its users but will also guarantee direct connections to the most important points of interests both, in and outside the city of Baden. Baden offers many cycle paths connecting residential quarters, the rail station and the public bathing beach.

In Mödling, the number of cycle users is increasing due to the growing number of parking spaces for bicycles and other concepts like better biking routes connecting the train station, educational institutions and other main spots in the city. Moreover, hire bikes are promoted as well. VOR and Badner Bahn are not only operating in Baden, but also in Mödling. The Citybus offers services inside the city center. [9]

4.3. Governance structure and legal obligations

According to law [11] the federal states of Austria as well as municipalities are responsible for public transport, which means that the responsibility is allocated to the federal state of Lower Austria. However, if the state of Austria supports the public transport system and provides financial investments, the so called "Verkehrsverbundorganizationsgesellschaft" are responsible for the regional transport systems.

The responsibility for road traffic regulations is splitted between district authorities (Bezirkshauptmannschaft) and municipalities. District authorities are responsible for federal state roads, whereas municipalities need to manage all the remaining kinds of roads and public traffic areas like public parking spaces.

In order to use regional knowledge concerning bicycle traffic, municipalities and regions are responsible for the implementation and plans for the future. NÖ.Regional.GmbH is an important actor in public mobility questions. It acts like an intermediary for municipalities and ensures a successful implementation of regional strategies concerning mobility. [12]

4.3.1. Existing strategies

Baden focuses on improving their cycling network in cooperation with different partner organizations like Radland Niederösterreich and Stadt-Land Management Wien-NÖ. In the course of the project 'SReg – Smart region' [2], they already carried out a demand analysis as well as planning a basic concept to contribute to close the chain of cycling routes and establish a consistent cycling network.

Baden and Mödling also joined the project `SReg – Smart Region – Stadt-Umland Süd`. In the course of this project the two cities try to establish and implement a five-year-action agenda, a demo concept and a roadmap to work towards the same vision.

The project covers the following topics:

- Greenhouse gas emissions;

- Increasing efficiency in the use of resources and energy through innovative technologies;
- Increasing the percentage of renewable energies;
- Multimodal and sustainable mobility supply.

Furthermore the project aims to integrate various stakeholders like the users of and citizens of the cities. Through an active participation a wider range and more precise knowledge can be acquired and used. Therefore, information sharing is vital [13]. Mödling concentrates on improving the integration of main city spots among others the Federal Secondary College of Engineering (HTL), the train station or the hospital. Moreover, different mobility possibilities (cycling network, car/ bike sharing, foot traffic and e-mobility) should be better connected in order to achieve consistency and increase the convenience for users. Mödling follows its vision of being a city of short distances by increasing e-car sharing and improving accessibility of e-mobility generally [14].

Baden already benefits from a well-connected transport system and has been especially concentrating on cycling and pedestrian traffic. However, these characteristics can be improved through further relevant measures. The short distance to Vienna is also very advantageous for the city of Baden. The citizens of Baden play a major role as stakeholders and make further knowledge accessible. Their aim is to improve e-mobility by car sharing systems, increase the number of high-quality parking spaces for bicycles and develop comprehensive mobility concepts [15].

As already mentioned, “Industrieviertel” is especially characterized by a high number of commuters. Hence, these measures are indispensable to guarantee accessibility, mobility and an overall and consistent network of different transport modes. All these measures guarantee that the participating cities act as role models and pioneers to stimulate other municipalities and citizens to work towards one vision.

4.4. Visions and goals

As already mentioned both cities try to work towards one common vision. Especially the cities and areas near the capital Vienna are getting more and more important due to phenomena like suburbanization and increasing numbers of commuters. Both cities aim to link other cities, or the capital with municipalities of their urban hinterland. Moreover they want to achieve an increasing quality of life and reduce the use of resources by incorporating various stakeholders.

The main topics and challenges of the visions of the cities concern innovative use of energy and resources and the use of renewable energies in the field of mobility, technologies and residential areas. In the field of transport both cities aim to reduce individual motor or car traffic and increase the use of cycling, foot traffic and PT by concentrating on the following [16]:

- Promoting and facilitating cycling and foot traffic;
- Park & ride facilities; Public transport systems;
- E-mobility and Smart mobility.

Therefore, the following tables show the mobility goals of the two cities which should be achieved in 2020 and 2025.

Table 4 mobility goals of Baden in percent [16]

BADEN	2005 (reference value)	2020	2025
Cycling	10%	12,5%	15%
Pedestrians	25%	25%	25%

PT	12%	13,5%	15%
E-mobility	0%	5%	10%
Individual traffic	53%	44%	35%
	100%	100%	100%

Table 5 mobility goals of Mödling in percent [16]

MÖDLING	2005 (reference value)	2020	2025
Cycling	8%	11,5%	15%
Pedestrians	18%	21,5%	25%
PT	11%	15,5%	20%
E-mobility	0%	5%	10%
Individual traffic	63%	46,5%	30%
	100%	100%	100%

Mödling promotes the vision of being "a city of short distances" in order to facilitate life of citizens significantly. Therefore, it promotes e-mobility, car-sharing systems, cycling networks, car/ bike sharing and foot traffic. Baden has already achieved this goal but aims to go deeper and improve this status [15].

5. Cityregion Bruck-Kapfenberg-Leoben (Austria)

5.1. Introduction to the region

This report focuses on the cityregion Bruck – Kapfenberg – Leoben, situated in the northern part of Styria, a province in the south of Austria. The named cityregion is the largest regional center in Styria and after Styria's capital city Graz the second central region covering an area of about 1.220 km². Bruck-Kapfenberg- Leoben is also located in the important touristic region Hochsteiermark characterised by its mountains covering an area from Semmering to Hochschwab.

Figure 6 Hochsteiermark [1]

Both cities, Bruck and Leoben show a polycentric room structure with different functional and economic focus. Due to its location at the crossing of the two rivers Mur and Mürz the city Bruck is an important trading, tourism and service center. Leoben is famous for its variety of cultural and educational institutions, locating one of the most famous technical universities in Europe, the Montanuniversität Leoben [2].

The University and numerous companies, as Voest Alpine, Böhler Edelstahl or IM Polymer mark the importance of the region as location of innovation, research and economy within Styria with focus on the industrial and service sector.

In the region the area of permanent settlement is limited (15% of the total region) due to the region's position in an alpine valley resulting in a population density in the two cities around 200p/km² [3]. Basically the cities and the whole region are challenged by a demographic change indicating population decrease and an ageing society where the young people leave their homes to move to larger cities (e.g. Graz) where they find a broader job offer not only focusing on industry.

In 2015 Leoben inhabited a number of approx. 24.500 citizens. Bruck an der Mur had a total of about 15.800 inhabitants [4]. According to Das Land Steiermark, the number of citizens in eastern parts of Styria is decreasing. The population in the district of Leoben is expected to decrease by 15.06% until 2050. Leoben can be characterized of having the highest age distribution. Still, the phenomenon of the ageing society can be perceived in both Leoben and Bruck marked by the majority of the population being between 45 and 59 years old. Generally a comparison of all Styrian districts showed in the districts in focus the lowest percentage of children and youngsters (15,5 and 17%) and at the same time the highest percentage of people older than 65 years (24%) [5].

In the following table the population of the city Leoben and Bruck-Mürzzuschlag is depicted. It shows the above mentioned tendency of a decreasing and ageing population in both cities until 2011. After 2011 the tendency is towards a growth [6] [7].

Table 6 Development of population [6] [7]

Year	1991	2001	2011	2016
Leoben	28.897	25.804	24.598	25.350
Bruck/Mur	14.046	13.439	12.548	15.891

The age distribution of the two cities in the beginning of 2016 is shown in the following table [7].

Table 7 Age distribution of Leoben and Bruck/Mur [7]

Age	0-14	15-29	30-44	45-59	60-74	>75
Leoben	2.787	5.470	4.444	5.514	4.259	2.876
Bruck/Mur	1.823	2.514	2.806	3.852	2.943	1.953

Since 2011 the rate of unemployment in Bruck and Leoben is basically increasing following the overall Styrian trend. With a number of 1.942 people (7,6%) in Leoben and 3.122 people (7,7%) in Bruck the unemployment rate in 2015 lies slightly under Styrian average (8,4%) and affects especially the age group between 25 and 50 years [8].

The main problems and challenges are the ageing of the population, emigration and the high demand of energy due to its level of industrialization [9].

Table 8 Unemployment rate of Leoben and Bruck/Mur [9]

Unemployment rate	2011	2012	2013	2014	2015
Leoben	6.6	7.0	7.8	7.3	7.7
Bruck/Mur	6.5	6.8	7.2	7.4	7.6

Figure 7 Hochsteiermark [10]

5.2. Description of the transport system

Basically the cityregion Bruck-Kapfenberg-Leoben has a well-established road network with high density of main routes and freeways offering quick connections in all directions. This fact explains the importance of motorized individual mobility as shown in the modal share of Leoben.

Due to the city's extension over a relatively small area important relations are within walking distance resulting in a high percentage (26%) of pedestrians [2].

However, for Bruck there is no data available about modal share or mobility in general. In contrast to Leoben Bruck's website has no hint at all to sustainable mobility or offers information about public transport possibilities.

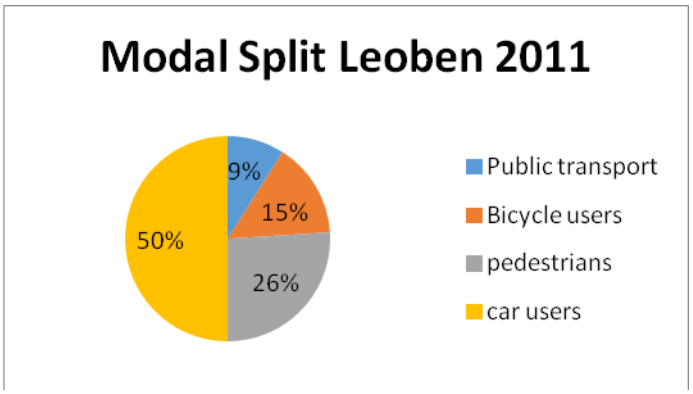


Figure 8 Modal Split of Leoben, 2011

When it comes to cycling (15% of modal share) the region's benefit is a well-established bikeway network being part of one of the region's "tourist magnet", the Murtal-Radweg. This famous bike route is connecting Styrian cities along the river Mur from its origin till the Slovenian border. Due to the valley position of Leoben and Bruck and the Murtal-Radweg going slightly downhill the bicycle as favored

mobility device should come more into focus in the future. The city is planning to expand the bike network in the region heading towards bikeways separated from the roads and an increased use of the existing main routes Murtal-Radweg (R2) and Eisenstraßen-Radweg (R38). By 2019 an extra bridge for pedestrians and cyclists should ease the non-motorised crossing of river Mur within Leoben. Furthermore Leoben offers a bicycle hire station and various charging stations for e-bikes and e-cars [11].

Regarding public transport opportunities Bruck and Leoben are important train traffic junctions offering both national connections to Graz and capital cities in other federal districts and international connections to e.g. Milan, Rome or Zurich. The train stations have park & ride facilities to ease the change from car to train. Further, freight transportation plays an important role for the region's industry, some of them having their own railway stations [2].

Mobility within Leoben and Bruck is warranted by a network of local and regional bus lines. A "missing link" is the connection of the two more or less isolated bus networks failing to establish attractive connections between the cities in focus.

Leoben runs city bus lines, operated by Stadtwerke Leoben and a bus-on demand system for regions not reached by the public transport, especially for persons with mobility impairment [11].

All public transport operators in the region are part of the Styrian Verbundlinie, a cooperation established between public authority and the transportation companies. This cooperation has the advantage of a transparent and standardized fare system based on tariff zones and validity period of the ticket. All tickets are not only valid for specific lines but within a specific number of zones. The result is a standard ticket price on train, bus and in commuter systems [12].

The transport system of a city or region in also influenced by the number of commuters and commuter flows. For Bruck and Leoben the commuting ratio of incoming and outgoing commuters is very similar and lies around 60 percent. The largest commutation flow is from respectively to Graz and Leoben/Bruck [13]. According to the major of Bruck the number of outgoing commuters using a car to get to work is relatively high. A problem in Bruck is the unattractive bike connection to the train station taking cyclists very long due to ling ways around.

5.3. Governance structure and legal obligations

According to law [14] the federal states of Austria as well as municipalities are responsible for public transport, which means that the responsibility is allocated to the federal state of Lower Austria.

The responsibility for road traffic regulations is splitted between district authorities (Bezirkshauptmannschaft) and municipalities. District authorities are responsible for federal state roads, whereas municipalities need to manage all the remaining kinds of roads and public traffic areas like public parking spaces.

5.4. Existing strategies

As a member of CIVITAS [15], a European initiative launched in 2002 to redefine transport measures and policies in order to create cleaner, better transport in cities, Leoben commits to the introduction of an ambitious, sustainable urban transport policy, e.g. offering e-bikes and a hybrid car for the staff of the city administration.

Leoben has already started to realize its concept concerning culture, economy, social aspects and ecology in order adapt the development of the city to the needs and challenges of the population and the upcoming years. In 2002 the concept of Leoben was established in cooperation with various stakeholders with different economic and political background as well as citizens. In 2007 the concept of the city has

been adapted in the course of different discussions and working groups. The change of this concept has evoked the planning process “Gestalten Sie die Zukunft 2008 – 2017” [16].

Leoben has already implemented a traffic concept in 2000. The parking space on the main square has been removed and new parking spaces near the town hall have been created and a pedestrian zone has been implemented [17].

Due to climate change and demographic change the city joined the Smart Cities project and developed a measure plan of how everyday life in 2025/2050 can be environmentally friendly, energy-efficient AND with the highest quality of life. Especially for mobility the vision is an increased awareness of flexible, event-driven choice of transport (cycling, car sharing, inter-modality are integrated in everyday life), decreased preference for private cars and making public transport “in” [18].

Also Bruck is part of the project Smart cities. It is one of the main traffic junctions in Austria. The city aims to develop a sustainable vision towards a greener future. Furthermore, the objective comprises various spheres of activity like mobility, construction, energy, supply and disposal. A roadmap and an action plan have been created in the course of a process comprising 3 stages. Various stakeholders have taken part in this project, among others citizens, representatives of all political parties, industrial enterprises, energy suppliers ect. [19].

As already mentioned Bruck aims to move towards a greener future through its sustainable vision 2050 “Bruck an der Mur – Lebens(t)raum am Fluss” which integrates the various fields of action like energy networks, mobility buildings, local supply and disposal systems as well as information and communication. One important objective is to install an integrative mobility concept with smart mobility solutions [20].

According to the analysis conducted within Smart Cities Project (2012), Bruck has a big potential to increase sustainable mobility. Unfortunately presently no data is available about modal split nor about mobility in general. Not only the lack of data but especially the lack of information flow about possibilities of public transport to the population seems to be a source to increase sustainable mobility.

5.5. Visions and goals

Stadtregion Leoben-Bruck-Kapfenberg

As mentioned in the introduction both cities are part of the city-region Bruck-Kapfenberg-Leoben being the second largest central region after Styria’s capital city Graz. City regions are merged living areas consisting of several cities and communes. To ensure a high standard living quality for the people within a city region requires a common acting and co-operating of all players. Between 2007 and 2013 the named cities took part in a Styrian support program for integrated sustainable spatial development with the following outputs:

- A feasibility study defining the needed quality and infrastructure of a cityregion as urban area and regarding its benefits.
- The draft of a central action and cooperation field namely the public transportation system taking into account characteristic regional assets. The result was a city regional express railroad concept.

By developing this concept the city region as such is being captured more easily [20].

Furthermore, there has also been established a so called living lab in Upper Styria to strengthen the co-operation between the three cities Bruck, Kapfenberg and Leoben and the region’s economic competitiveness against the booming capital Graz. The main aim of the mobility lab share+exchange is to develop innovative traffic concepts for the movement of travelers as much as for commercial traffic and freight services. The growing trend of sharing will be considered, analyzed and used for innovative mobility concepts [21].

Still, regarding the commuter flows workplace mobility plans are not in question, neither for the cities themselves nor for the whole cityregion.

6. Banská Bystrica (Slovakia)

6.1. Introduction to the region

6.1.1. General description of the country

Slovakia is small country in the Central Europe. Population is 5,4 million inhabitants, area is 49.000 sq km. The prevailing landscape character is hilly and mountainous, with a couple of larger lowlands in south-western and eastern parts of the country.

The history of the area is a rich, it was populated (though thinly) even in the Paeolithic era. It was the most developed region of the Hungarian empire in 17th and 18th centuries. Today it is small open high-income economy (75 % of the EU"s GDP per capita), the main industry is car- and electrical manufacturing.

The capital city is Bratislava (600.000 inhabitants). The country is divided into 8 administrative region, one of them is the Banská Bystrica region.

6.1.2. General description of the region (region = FUA BAnská Bystrica).

Region (FUA) Banská Bystrica is located in the very center of Slovakia. It is hilly region (the elevation range is from 300 to 1232 m a.s.l.) with main center in the town of Banská Bystrica surrounded by 13 villages. In history it was mostly mining and logging region, the main industries today are mechanical industry, logging, timber processing tourism, administration, education, health care and services. Banská Bystrica is the administrative center of one of 8 Slovak administration regions. One university and one college are located here as well as headquarters of some important public/governmental institutions (e.g. Slovak Tax Office, Slovak Post, State Nature Protection, Slovak Environmental Agency, Office of Industrial Property). The FUA consists of the historical city center, surrounded by urban living quarters and industrial suburbs (partially in the valley, partially in elevated areas) and then by hilly rural areas and settlements.

The FUA Banská Bystrica is located in the valley of the Hron River with direct economic, social and transport connection to areas of cities Zvolen and Brezno, both economic and social centers nearby.

6.1.3. Municipalities of the region

The center of the FUA is the town of Banská Bystrica. All other municipalities are much smaller: Špania Dolina, Selce, Harmanec, Kordíky, Nemce, Riečka, Tajov, Kynceľová Králiky, Malachov, Badín, Horné Pršany and Vlkanová.

Figure 9 Map of the region Banská Bystrica; typical picture of the region Banská Bystrica

6.1.4. Population and economy

Total population of the FUA is 114.071 (2008). Population decreases slowly thanks to natural decrease and thanks leaving the area for better job or education opportunities in the capital city Bratislava or even abroad.

Total 55% of population has got high education (gymnasium, high schools), 21% of population has got college/university degree.

The age distribution is as follows:

- Age 0 - 14: 13%, mildly decreasing
- Age 15-64: 73%
- Age 65+: 14%, mildly increasing

The economy performance of the Banská Bystrica region is not very high. The GDP per capita is 9855 € (2015), what is the second worst in Slovakia (average is 13596 €). Average monthly salary in the town is not available, however it has t be higher than in the whole Banská Bystrica region 622 € (2013), as far the Banská Bystrica town is the most developed part of the region. However, the town's average salary still doesn't exceed the Slovak monthly average salary 701 €.

The Unemployment rate is not known for the FUA. However, the unemployment rate of the district of Banská Bystrica (larger than the FUA) is 7,5 % (May 2016) and we suppose it is more-or-less the same in the FUA. About 50% of unemployed people are long-term unemployed (more than 1 year) what is a big issue a far they are loosing a labor habits. More than 10% is unemployed more than 4 years. About 50% of unemployed people are people with higher education and rather high number 12% are people with college/university degree. However, we suppose unemployment rate is slightly lower as stated as far there is some part of formally unemployed people who work without labor contract (black work).

6.2. Description of the transport system

The transport system in the FUA Banská Bystrica is pretty developed. It is an industrial area where transport of persons and goods is important so road network as well as transportation services are on higher level. However, it is really unbalanced, there are areas with very low density of roads.

The reliable modal share information is not known, no relevant counting was organized. Cars are counted only on motorway on the entrance to the town, however numbers are not provided publicly.

The roads in the FUA are divided in 5 main categories:

- motorways – of international and national importance, in total length of 12,53 km are managed either by state National Motorway Administration and by private company GranVia contracted by state on the public-private partnership principle;
- roads of 1. category – of international and national importance, in total length of 5,66 km are managed by state Slovak Roads Administration;
- roads of the 2. category - of regional importance in total length of 6,59 km are managed by Banská Bystrica Road Management company, founded by the Banská Bystrica regional administration;
- roads of the 3. category – of local importance in total length 20,88 km, managed partly by Banská Bystrica Road Management company, founded by the Banská Bystrica regional administration and partly by the city administration (via contracted local company);
- streets - local communications mostly in housing and industrial areas in total length 340 km are managed by the city administration (via contracted local company).

The shape of the road varies, particularly roads of 2. and 3. category and many streets are in very poor shape. In general, roads are well maintained in winter, the system of snow ploughing is efficient, what is particularly important in hinterlands which are located in hills with a lot of snow.

The cycling communications are almost not present in the FUA. There is only 1,5 km cycling lane from the Europa Shopping Centre to the Štiavničky sport stadium in wider city centre. In addition, the central SNP Square is a pedestrian zone with cycling allowed. There are also some routes used mostly by cyclists on the city outskirts (to Vlkanová and to Šalková) used both for recreation and commuting but they are accessible by cars so they are not classified as cycling infrastructure. Six new cycling backbone routes are under projecting. They will connect main living quarters with the city centre. They are expected to be financed by the European funds in upcoming years.

The public transportation network is well developed, however its capacity is not used fully. In average the public transport in the city is used by 11-12 million people annually (in the 2016, 5 927 000 there were users by 1.6.2016) what is small part of the traffic share. The line network and times schedule from main living quarters are rather appropriate, allowing commuting to work and school. However, connection with smaller living quarters and hinterlands is not so good, mostly frequency is not sufficient what force people to use cars.

Management of public transport in the Banská Bystrica FUA is divided between three companies:

- Dopravný podnik mesta Banská Bystrica, a.s. (DPMBB, Transportation Company of the Banská Bystrica City) operates 8 trolley-bus lines in the town by 29 trolley-buses. Its annual ride is about 1 250 000 km.
- Slovenská autobusová doprava Zvolen, a.s. (SAD ZV, Slovak Bus transportation Zvolen) operates 22 urban bus lines in the town and 16 suburban bus lines by 57 buses. Its annual ride is about 2 200 000 km.
- All buses and trolley-buses are rather new and are in good shape. The bus transportation in the town is heavily subsidized by the town budget. The total budget of the public transportation is about 8 millions euro annually, 50% is coming from fares, and 50% is subsidized by the town administration.
- Železničná spoločnosť Slovensko, a.s. (ŽSSK, state Railway company Slovakia) operates suburban trains, it share on the transportation in the FUA is not big (exact numbers are not known).

There is one more train company Regiojet which provides services in Banská Bystrica, however it has no significance from point of view of local/FUA public transportation as far it operates only one long distance line from Zvolen to Banská Bystrica to Prague (not used for local transportation).

Common ticketing is established for the city and suburban bus transport network. Personal electronic cards are heavily used. The train company runs its own fare system.

Information is provided by generally used information sources which are not run by bus companies but by the third sides – internet and mobile applications mostly. Of course, there are time tables on the bus stops.

The taxi transportation is rather developed and popular. There are 7 major taxi companies which compete a lot what results in appropriate flat rate 2,50 € for drive within in the wider city center. Therefore taxi is often used instead private cars as well as instead public transportation.

Despite developed public transportation system and taxi companies individual car transportation is still far the most preferred mode, considered as the standard mode of transport by majority of the FUA population. It is justified to some extend as far public transportation from small living quarters and from hinterlands is not sufficient. Congestions in rush hours are becoming eminent problem. As well parking is a significant issue, both in living quarters and in the city center and workplaces. Parking in the city center is not sufficient for actual demand and is paid. That is why cars occupy a lot of public spaces, sidewalks and greenery.

6.3. Governance structure and legal obligations

In Slovak circumstances "to be responsible" means to order and to subsidy transport of passengers in given region of authority.

There are three authorities responsible for public transportation:

- Bus transportation is divided among:

  Town Office of Banská Bystrica - urban buses and trolley-buses

  Office of the Banská Bystrica region - suburban buses
- Train transportation is ensured by Ministry of transportation of Slovakia (central level). Railways are managed by the Slovak Railways.

The responsibility and operation of roads and street in the Banská Bystrica FUA is divided among a few entities:

- motorways - Národná diaľničná spoločnosť (National Motorway Administration) and GranVia;
- 1. class roads - Slovenská správa ciest (Slovak Roads Administration)
- suburban roads of 2nd and 3rd class: Administration of Banská Bystrica regional Roads
- town streets, pedestrian zones: Municipality of Banská Bystrica
- others

No obligation. One regulation of the Labor Code 311/2001 prescripts obligation for employers to create safe storage of transportation means that employees use to commute (except cars). It means employers should provide safe space for parking of bicycles, if any. However, this obligation is not respected by employers and not demanded by employees (who are afraid to be dismissed).

6.4. Existing strategies

The most important existing strategies related to transportation implemented in the FUA of Banská Bystrica are as follows.

Territorial Transport Masterplan of Banská Bystrica is an obligatory document compulsory required for elaboration of the Zoning plan according to the Act 55/2001 about territorial planning and its documentation. It was elaborated in 2011. The main goals of the document are the prognosis of transportation development in the town till 2025 and the conception of transportation development. The document is used not only for zone planning but also for setting of the transportation policy in town.

Preparation of the masterplan consisted of four steps: traffic research, transportation analysis, elaboration of concept and proposals and commenting and finalizing of the masterplan.

The final masterplan document proposes measures to improve the transportation in the town. Several main aspects were solved: main transportation corridors of international and national importance, regional and hinterlands connections, internal in-town communications, static transportation (parking), municipal and suburban bus transportation, railways transportation, air transport, walking, cycling. The final recommendations are valuable and there are clear indications to sustainable mobility, however whole document is strongly focused on adjusting of road infrastructure to increasing number of cars and it doesn't develop ideas of deceasing of number of cars.

Territorial Masterplan Non-motorized Transportation of Banská Bystrica is one of the pilot documents of non-motorized transportation even in Slovakia. It was elaborated in 2012 in order to incorporate the non-motorized transportation in the Zoning plan. The document determines 10 main cycling corridors which connect main living quarters of the town with the city center. In addition, secondary cycling corridors were proposed to connect main ones mutually. Totally 46,6 kilometers of safe cycling corridors is defined in the document and they were implemented in the Zoning plan afterwards.

Proposed cycling corridors are further connected with possible cycle routes to hinterlands as well as with main cycle touristic and recreational routes in the town's vicinity.

All proposed main and secondary cycling corridors are incorporated in the Zoning plan of Banská Bystrica adopted in 2016. Actually (2016) the project documentation of 6 of proposed cycle corridors (30 km) is under preparation and it is expected they will be funded by the EU structural funds in upcoming years.

Plan of Transport Services of Banská Bystrica is document which determines long-term stabilization and development of public transportation. It was elaborated in 2010. The document sets basic principles of the public transportation optimization, a sequence of steps/process to improve public transportation, proposal of new bus lines, proposal of optimal intervals, forecast of transportation work (necessary for economic forecasts), assessment of environmental impacts of developing of public transportation and recommendations of further steps and processes. The document is strongly focused on commuting to work schools and social and health care services, so it is supportive to sustainable mobility in the town. It touches also connecting with hinterlands.

Though document is older (2010) it is necessary to say that it was and still is respected and implemented in last years when public transportation network in the town was modernized and improved.

Plan of reconstruction of local communications is focused on planning of reconstructions of streets and sidewalks in the town. It was elaborated in 2015 for period 2016-2020. The sequence of local communications (streets and sidewalks) reconstruction was based on their categorization according to its shape (5 levels from very good shape to total disintegration of surface) and traffic load (5 levels from very low to very high level of load). The plan is background document for annually elaborated action plan of reconstructions funded by the local budget.

In addition, the Plan of Winter Street Maintenance is important document for sustainable mobility. It is adopted annually before winter. It determines prioritization of snow plough including time limits after snowing. The plan is very important from point of view of commuting to work.

Today there is no sustainable urban mobility plan (SUMP) in Banská Bystrica. However, its elaboration is being launched in upcoming month. The City Hall considers it as very important document not only

because its obligation for EU funding but also because of increasing pressure of car transportation on the city social, living and physical environment. Launching of elaboration is expected in 2017.

On the other hand, the workplace (institutional) sustainable mobility plan of the City Hall will be launched in 2017 within the MOVECIT project. It will be the very first institutional sustainable mobility plan in Slovakia.

Transportation and traffic are incorporated also in other strategic plans – the Plan of the Economic and Social Development and the Regional Integrated Territorial Strategy of the Banská Bystrica region. They are shortly described in following chapter.

6.5. Visions and goals

The main strategic document valid in the FUA is the Plan of the Economic and Social Development. It was prepared in 2014 by The City Hall of Banská Bystrica. Though main motivation of its preparation was access to the EU funds, it is valuable document elaborated carefully by local planning experts with emphasis on participation of local stakeholders and citizens. Thus we can state it reflects current visions and goals very well.

The Development vision of Banská Bystrica taken from the document is: Banská Bystrica will be the town which is worthy to live, come and stay. This vision is supported by the Strategic goal for 2023: To increase attractiveness of the town for citizens, investors and visitors.

A way of accomplishing of the vision and strategic goal is further specified in 3 priority directions of development:

- 1. Prospering town: prospering town is focused on programs of economic development, education, transportation and technical infrastructure.
- 2. Civic town: Civic town has got two programs – modern self-government and culture, sport, free time and youth.
- 3. Healthy town: Healthy town is focused on programs of Social development, housing and health and environment.

Each of direction is further detailed in sectional aims, priorities and their specific and thematic goals.

The most relevant development program from a sustainable mobility point of view is 3.1. Transport infrastructure. Alongside connecting of the superordinate transport systems it is very directly focused on sustainable mobility by its focus on routes for pedestrians and cyclists, park-and-ride lots, ecological and non-motorized transportation. Thus thematic goals are:

- T.12. Finishing of the superordinate state transport networks.
- T.13 Revitalization of public spaces, local communications, creating of supportive environment for balanced development of all forms of transportation with preference of ecological one.
- T.14 Creating of supportive environment for processes of sustainable mobility in the town.
- T.15 Increase of share of non-motorized transportation on overall transportation work.
- T.16 Increase of number of persons in public transportation.

All these goals are further developed on the FUA level in the document Regional Integrated Territorial Strategy of the Banská Bystrica region. It is very comprehensive document, elaborated under the Banská Bystrica regional Administration and the City of Banská Bystrica. It defines four priority axes:

- 1. Safe and ecological transportation in the FUA Banská Bystrica.

- 2. Improving access to efficient and quality public services in the FUA Banská Bystrica.
- 3. Mobilization of creative potential in the FUA Banská Bystrica.
- 4. Improving of quality of life in FUA Banská Bystrica with emphasis on environment.

The most relevant priority axis from the sustainable mobility point of view is the first one. It is more specified in the investment priorities and specific objectives:

- Investment priority 1.1. Improving of regional mobility by connecting of secondary and tertiary nodes and TEN-T infrastructure including multimodal nodes.
- Specific objective 1.1. Improving of accessibility of the TEN-T road infrastructure and 1. class roads with focus on development of the multimodal transportation system .
- Investment priority 1.2. Development and improving of ecologically supportive low-carbon low-noise transportation systems.
- Specific objective 1.2.1.: Increasing of attractiveness and competitiveness of public transport.
- Specific objective 1.2.2.: Increasing of attractiveness and share of non-motorized transportation (particularly bicycle transportation).
- Investment priority 1.2. and its specific objectives are particularly related to the MoveCit project.

Two most important strategies stated above, define visions and goals thoroughly. In contradistinction to older strategies, which were focused on "heavy" industrial development, today it is focused on sustainable development. Much stronger emphasis is put on soft measures, quality of life and environment, education, sustainability, creativity, etc. It is important to see how large focus is dedicated to sustainable mobility. It is clearly stated that development of all forms of mobility (not only individual car transportation) should be assured in balanced way and public and not-motorized transportation are apparently preferred. These goals are very supportive for the project aim. On the other hand, it is still clear that change to sustainable mobility is coming only hardly. Though more people and authorities speak about it, still individual car transportation is dominant and – maybe subconsciously – preferred.

7. Békéscsaba (Hungary)

7.1. Introduction to the region

Hungary is a Central European country in the Carpathian Basin, bordered by Slovakia from the north, Ukraine from the northeast, Romania from the east and southeast, Serbia and Croatia from the south, Slovenia from the southwest and Austria from the west. Its capital and most populous city is Budapest. Hungary is a member among others of the European Union, the NATO, the OECD and UN, is in the Schengen Area and also one of the founders of the Visegrad Group. Hungary's territory is 93030 square meters putting it into the middle of the countries' rank based on their territory.

The Békéscsaba micro-region can be found in Békés county in the southeast part of the country near the Romanian border. Among the cities belonging to the micro-region Békéscsaba is a county seat too while the other towns are smaller. Comparing to the other micro regions of the country the Békéscsaba micro-region overall can be considered a developed one.

In Békés county and in the whole region the population is decreasing. The Békéscsaba micro-region lost 5% of its permanent residents in a decade. Considering that 90% of the overall population of the micro-region lives in the county seat Békéscsaba, the demographical data of people living there form the entire micro-region's demographical progression.

In the whole region the small town type is typical. The rural areas, principally the towns of 1000 and 500 inhabitants have the typical problems of being located far from the functional centers, having low level availabilities, poor infrastructure, lack of education and health services and high rate of exodus. The problems and characteristics are diverse in each area.

More than one-fourth of the county's population lives in the Békéscsaba micro-region. In the micro-region the average town population is more favorable than the county average primarily thanks to the weight of the county seat. Sixty-four thousands of the seventy-six thousand inhabitants of the Békéscsaba micro-region live in Békéscsaba which explains the favorable rate of urban population in the micro-region. In Békés county the rate of urban population is the highest in the Békéscsaba micro-region. In the Békéscsaba micro-region Csabaszabadi has the fewest inhabitants with a population of fewer than 500.

In the Békéscsaba micro-region the town with the smallest population and population density is Csabaszabadi. Kétsoprony, Telekgerendás and Szabadkígyós are also under the average population density of the country (108/m2) due to their small town type.

The Multifunctional Association of Békéscsaba Micro-Region was established in July 2004 with the cooperation of five local governments, Békéscsaba as its center and the organization of the neighboring Telekgerendás, Csabaszabadi, Kétsoprony and Újkígyós.

In the recent years due to the decreasing number of population and the unfavorable age distribution the rate of economically active and passive people has changed: the rate of active people including the employed ones has significantly decreased and the increased rate of unemployment contributed in that decrease too. The 40% employment rate is significantly under the country average of 52% which is exceptionally low compared to Europe.

In county comparison the rate of towns in the Békéscsaba micro-region is more favorable. The 6.8% rate of Békéscsaba, the 6.9% rate of Újkígyós and the 7% rate of Kétsoprony are slightly above the country average (6.7%).

Along with the increase in the number of unemployed people and the decrease in the employed ones the number of inactive seekers and their rate in the population is increasing as well. In the micro-region the number of rentiers and disabled pensioners increased in the recent years.

7.2. Description of the transport system

The developing trends of similar-sized European cities indicate that due to the urbanization progression the mobility needs of the population are progressing both quantitatively and qualitatively. The growth of motorization level contributes in this progression which level is not decreasing significantly as an effect of the financial crisis either. Due to the effect of social and economic progressions the traffic effects of urbanization appeared even in Békéscsaba with a delay. The multitudinous change of lifestyle caused by the accelerated consumer progressions significantly increases the qualitative needs and expectations of the society. The automobile as a real transport alternative is getting more available to people while the sustainable development of the public transportation's quality is getting more difficult due to lack of demand. The rates of modal split based on households can be seen on the following diagram (September – October 2009).

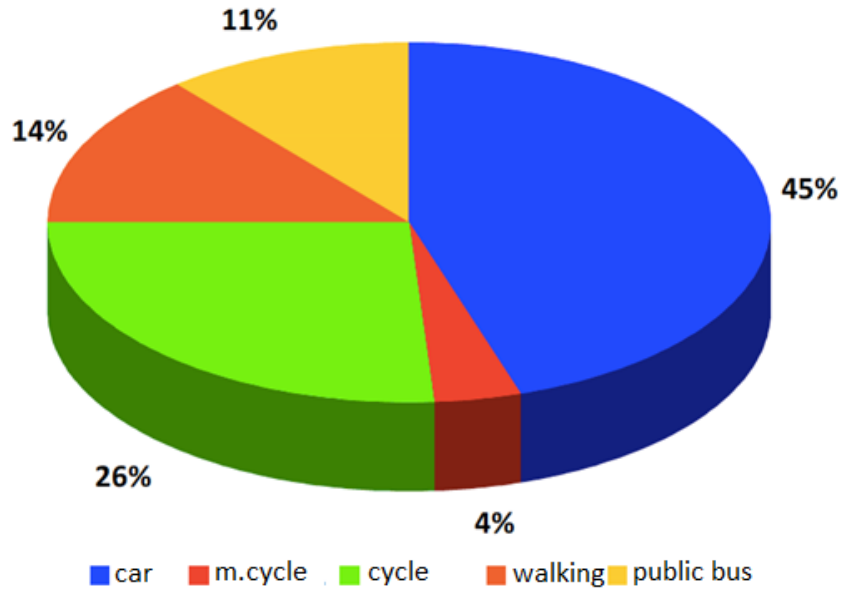


Figure 10 Modal split

The 11% rate of public transportation is acceptable at the rural level. In the future the cost-effective measures of the service provider might expectedly affect favorable this rate.

The motorized individual transport (automobile, motorcycle) has a rate of 50% largely because the load of public roads doesn't reach the theoretical capacity limits.

Based on the results of road transport modeling not even in 5-10 years there will be serious capacity problems on the important roads and intersections of the city. In the bottlenecks of the road network even today there are traffic jams mostly in the morning and afternoon rush hours.

In the downtown of Békéscsaba one of the biggest problems is caused by the not sufficient function of the public area's parking system. The problems arise mostly in the downtown at the establishments near the city center that has a significant traffic. For resolving the parking problems the decree 33/2000 (IV. 24.) allocated paying parking lots in the downtown of Békéscsaba. Currently there are around 1800 parking lots with 51 parking ticket machines.

The rapid growth of public road motorization involves the necessity of public road infrastructure development. Today meeting the parking demands poses a significant problem in every bigger city in Hungary, especially their downtown zones. Local people are using automobiles in a higher rate and rural people arriving to the catchment areas have become more mobile and they arrive to cities in automobile in an increased number.

According to the traffic analysis performed in autumn 2009 the peculiarity of local transport to workplaces in the case of travels in the downtown is that primarily in families who own two or more automobiles parents take their children to school while going to their workplaces in the morning. This peculiarity generates significant extra traffic near schools primarily in the downtown and has an effect on parking habits as well.

The city's local and regional public bus transport are provided solely by the DAKK cPlc. In the case of travels in the city the rate of people using bus doesn't reach the country average (11%) and according to the analysis performed by the Körös Volán among them there is a high rate of people using benefits (students, pensioners). The current creation of the road network asides from some exceptions fits the structure of the city providing an appropriate level of coverage. The local public transport service covers the whole territory of the city, the outer living spaces and the small towns of the agglomeration inside Békéscsaba's administrative borders (Gerla, Fényes, Mezőmegyer etc.)

In the poorly covered territories an alternative solution for providing public transport service is the Demand Responsive Transport (DRT) even purely on market grounds involving private carriers. The general characteristic of public transport is that due to the rise of motorization level and the economic-social progress it is getting harder for it to keep up with individual transport. Benefits and supports introduced countrywide make the position of public transport more difficult financially (benefits of students, free travel of people above the age of 65) while the sources of operation support are getting harder to be provided. These proceedings and the change in the mobility demands of people (for example the demands for the door-to-door service) effect unfavorably the number of people using bus.

Pedestrian and cycle traffic:

As a city in the Alföld, Békéscsaba has a prominently high rate of cycle transport (26%) even compared to the country average. The cycle traffic primarily is transport aimed (transport to workplace, use of bicycle as a daily transportation form) while the rate of recreational cycling is considerable and is rising. To this it's conducive that in the current economic situation choosing cycling as a transport alternative depends more on financial consideration while its prestige is relatively low. The length of the urban bicycle route network is nearly 18 kilometers. The typical urban bicycle route networks are 3-5 kilometers long which means 10-20 minutes of travel time. The bicycle routes are positioned mostly next to the main roads out of the city and their connection in the internal zones of the city is partly resolved. The terrain characteristics of the city are favorable to the greater spread of cycle transport which is demanded by the people too.

The rate of pedestrians is high even on an urban level (14%) and the city's structure, the relatively small distances (maximum 15-20 minutes of walking distances) and the structure of public transport network and the timetables (extra walking) are all conducive to this. The length of solid pathways is more than 240 kilometers (2009).

Rail transport:

Békéscsaba is situated on the Budapest-Szolnok-Lökösháza railway (international corridor number IV, main line number 120). The connected main rail lines are heading to Békéscsaba – (Gyula) – Kötegyán – Püspökladány (number 128) and Békéscsaba – Szeged (number 135). The city's territory is divided by the Budapest – Szolnok – Lökösháza railway that raises numerous urban and transport development problems. The railway station is situated in the territorial center of the city. The bus station where local and regional Volán buses arrive was established directly next to the railway station. The current functions of the bus station: it's a passenger station, shunting yard, commercial yard and towing yard. According to the travel habits commuter traffic and traffic to workplaces are significant. The reachability of educational institutions (institutions of higher education) is especially significant which strengthens the weekend rush hours (Friday afternoon, Sunday afternoon and Monday morning).

There is also air and water transport with mostly touristic significance.

The transport policy matches the EU directives:

From the several strategic documents of the European Union the Green Paper on urban transport called "Towards the new culture of urban mobility" followed the White Paper that was reviewed in 2006. The Green Paper reveals important strategic directions to the big and medium sized cities of the member states that can be simply and effectively adopted in the transport policy.

Among the set of viewpoints of the Green Paper we highlight the aims especially important (current and predictable) to the transport policy of Békéscsaba City with County Rights:

1. Mitigation of traffic jams,
2. Greener (environmentally friendly) cities,
3. More intelligent urban transport,

4. Barrier-free access to urban transport,
5. Urban transport that is safe and provides sense of security.

Among the numerous EU documents influencing urban transport the Charter of European Sustainable Cities and Towns Towards Sustainability forms the theoretical basis of urban development and is to be mentioned. The Charter's main priorities concerning transport are the following:

1. It is essential that the automobile transport would decrease;
2. The mobility has to be organized in a way that it would help the sustenance of the sustainably improvable, viable city in a way that the different types of transport would coexist;
3. Streets have to become a social scene again;
4. Considered educational and training activity is needed;
5. Relations of the areas between the towns and near the cities have to be formed in a way the every citizen could reach any place without obstacles;
6. The possibility of travelling, individual and public transport have to be open for everyone;
7. The urban environment has to facilitate every citizen's good health;
8. The condition of economic growth and progress is an infrastructure that sufficiently ensures its foundations, sustenance and boost.

Countrywide matches:

The following documents are the most important national and regional documents that are matched by the transport policy and the transport development proposals:

1. New Hungary Development Plan (National Development Plan II.) (Between 2007 and 2013.);
2. National Territorial Planning Concept (Act XXVI of 2003, amended in 2008);
3. National Territorial Development Concept;
4. Hungarian Transport Policy;
5. The Territorial Development Concept of the South-Alföld Region (1999);
6. Territorial Planning Project of Békés County (2004).

7.3. Governance structure and legal obligations

In the South-Alföld part of Hungary, thus in country of Békés, and within Békéscsaba micro region the DAKK cPlc. carries out the duties of public transport by bus. This includes the long distance, the regional and the local lines, the latter is only in the city of Békéscsaba from the municipalities if the micro region.

The bus transportation provided by the fully state-owned DAKK cPlc. company, from which the town buy it as a service and pay for it.

In the micro region the sections of road network outside the settlements, especially the elements of main roads are state-owned, so they are responsible for their maintaining. The remaining, mostly urban roads (inside the city) are owned by municipalities, so the city is responsible for these, for the maintenance during all year and appropriate quality.

There are smaller conflicts due to maintenance, because the municipalities and the state side also want the other to be the owner of these road sections, because the owner should pay the operating and maintenance costs. For example after finishing the Békéscsaba bypass road, the Hungarian Public Roads

cPlc. wanted to give the inner sections of main road number 44 to the municipality of Békéscsaba, because now the main road network can be used without touching the city's roads.

There is no workplace mobility in the Békéscsaba micro region and its surroundings. The areas are so high, that even workplace mobility plan so not exist and there is no demand neither from the municipality, nor from the companies. It is not yet a survey that there are any needs from the workers. Now, every employee solves their own access to work with one of the options available.

7.4. Existing strategies

There is only one transport development plan which was created for the city's order. In the concept the current transport situation, the reveal of the problems and the proposals to solve them, the concrete short-, medium- and long term aims and the tasks for achieving them are all written.

This concept includes intersection and cross section traffic count, modelling, future traffic projection and household survey too:

1. Road traffic survey, intersection and cross section traffic count,
2. Household surveys,
3. Public transport passenger surveys,
4. Public transport passenger count,
5. Parking survey

It contains the following concrete proposals and detailed task descriptions:

1. schedule of urban road renovations,
2. establishing urban exploration and intersection roads,
3. development of downtown bicycle route network,
4. expansion of downtown walking zones,
5. necessity of traffic rearrangement
6. with the construction of bypass the determination of the roles of state roads getting into the usage of the municipality
7. development of the interconnection between Jamina and the inner city part (in accordance with the MÁV developments
8. schedule of highway road network developments
9. determination of the airfield's role and it's appropriate development

Certain parts of these tasks have been realized but other parts are still to be done.

7.5. Visions and goals

The transport policy in accordance with the urban development aims of Békéscsaba City with County Rights sets the transport development directions and the assigned tasks that help to improve the quality of life and the standard of living in the city. The transport policy takes into consideration the European Union's development priorities as well as its societal and social viewpoints.

The long-term aim of the city is to become the region's central in economics, public administration, vocational education, commerce and services as well as becoming a regional center in the field of e-

services by developing info-communications. For this purpose it's necessary to set the main directions of transport development.

The positional advantages of Békéscsaba's geographical position are worthy of being considered. The development of the city's outer transport connections is the condition of reachability. The international rail corridor number IV crosses the city while the long-range developments of highway number 44 (M44) help to improve reachability by the connecting to the circulation of the freeway improving the potential of economic progression. Outer public road connections improve the conditions of border area cooperation.

The development of the inner transport of the city includes the development of public road connections, the assurance of the sustainability of public bus transport, the promotion of using non-motorized transport modes (pedestrian traffic and cycle transport). The decrease of traffic in the downtown and in the living spaces is an important task too in order to make the city more viable.

The development of urban parking system, the rationalization of parking in public areas, developing a modern parking management strategy by increased service charges help to stimulate the economy and to improve the urban quality of life.

For the local government the task of the development of urban road safety means the modernization of the infrastructure, the use of traffic technological devices that minimalizes the risk of accidents, the promotion of the authority's preventive and monitoring activity exercised in order to increase traffic safety and the campaigns and mobility mentality that improves the image of the city as well.

Increasing the fascination of Békéscsaba and the Middle-Békés Centrum requires tasks connected to the improvement in the conditions of accessibility in the transport development. The traffic to workplaces, the conscious development of the city's economy, the improvement of conditions that help to minimize urban freight transport traffic overflow, strengthening the position of educational institutions all set requirements to infrastructure development, to the improvement of the quality of public transport and to the improvement of transfer connections as well.

8. Budapest (Hungary)

8.1. Introduction to the region

Hungary is a landlocked sovereign country located in the Carpathian Basin of Central Europe. Hungary is situated in the low, flat area with a gently undulating landscape of hills and plains, and it features one of the largest continuous grasslands in Europe. The very same elemental forces that brought about its thermal springs, also created hundreds of kilometers of limestone caves through erosion, a portion of which are navigable with guides and an even smaller portion that have been fitted with paving and steps for organized tours.

Hungary is a member of state of the European Union, OECD, NATO and a Schengen state. Population of Hungary is around 10 million but unfortunately it is decreasing, the majority of the population lives in Budapest. The most important sectors of economy of Hungary in 2015 were industry (27.4 %), wholesale and retail trade, transport, accommodation and food services (18.3 %) and public administration, defense, education, human health and social work activities (17.6 %). [1]

Budapest is the capital and the largest city with 1.7 million inhabitants. Together with the agglomeration more than 2.5 million people live and travel in Budapest and around Budapest. The city is situated along the Danube. Budapest is the most important Hungarian road terminus, all of the major highways and railways ends within the city limits. The city's importance in terms of traffic is very central, because all major European roads and European railway lines lead to Budapest. [2]

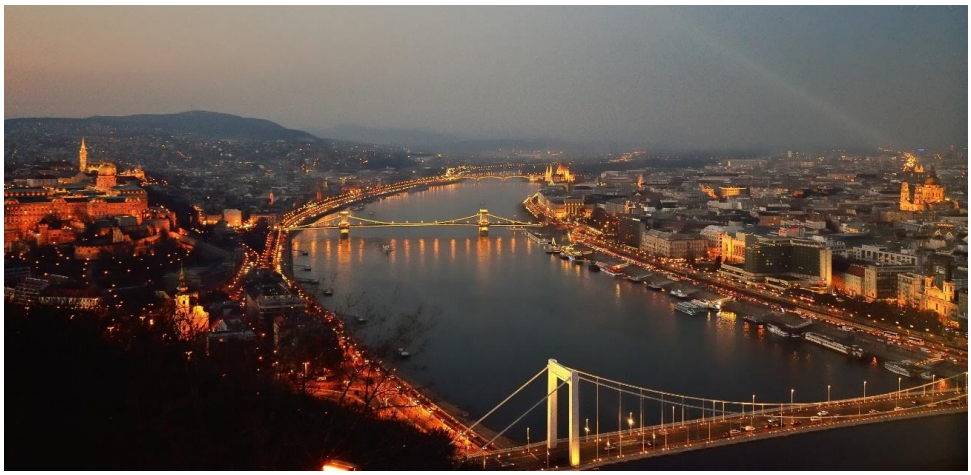


Figure 11 View of the city - Budapest

Budapest is the economic and political center, being the largest metropolitan area in Central Eastern Europe. Budapest is the seventh largest city in the European Union. The city covers an area of 525 square kilometers and the city had a population density of 3,314 people per square kilometer, rendering it the most densely populated of all municipalities in Hungary. [3]

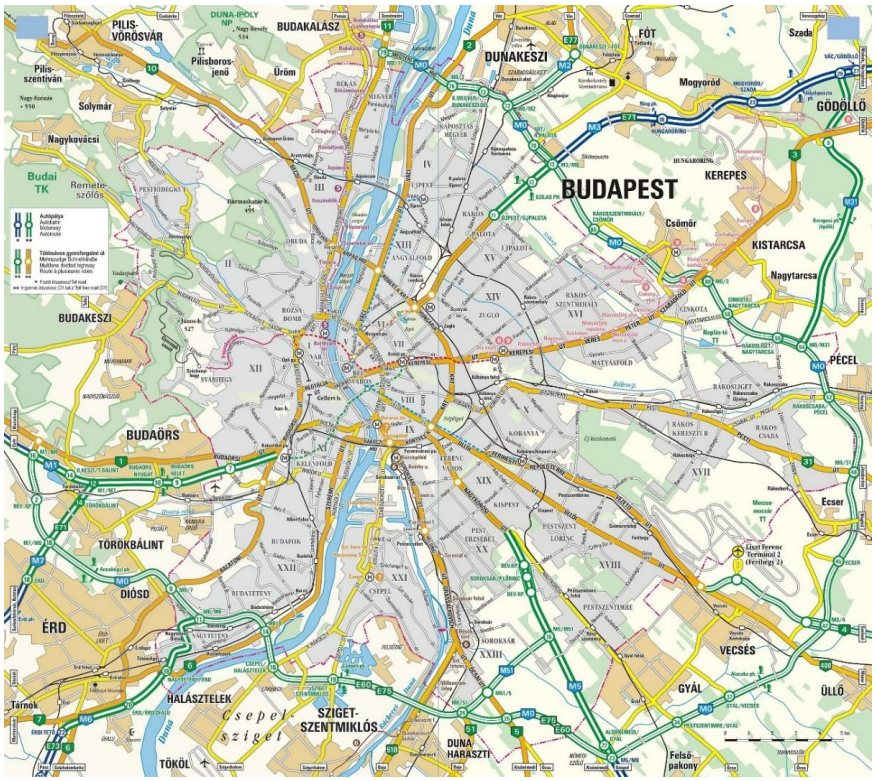


Figure 12 Map of Budapest

Budapest is considered a financial hub in Central Europe with a developed service sector. Budapest is a leading city in Central Eastern Europe in the implementation of transport management organizational schemes, in charge of integration of different transport modes, and of building organizational capacity for the implementation of sustainable measures.

Budapest consists of twenty-three districts, it has a dual self-government system, in addition to the Budapest Municipality and the local governments of Budapest, each of the twenty-three districts have their own government, with elected mayors and a body of representatives.

The General Assembly of Budapest and the district bodies of representatives are equal in terms of their basic rights, with no hierarchic relationship between them. A division of labor has emerged among the autonomous and equal local governments which are in line with duties and responsibilities. Local government tasks are generally implemented by the district governments while tasks stemming from its nationwide scope and related to multiple districts or the city as a whole are undertaken by the Budapest Municipality.

The Municipality of Budapest provides public services, within its scope of responsibilities, through municipal institutions, business entities and public utility companies founded by itself or, to a lesser extent, through purchasing services. The City maintains and supervises hospitals and polyclinics, art and public culture institutions, children's and youth homes, secondary schools and dormitories, social homes providing specialized care, markets and market halls. Certain theatres maintained by the City operate as non-profit companies. Following their transformation, public utility works of the Municipality of Budapest now operate as companies. [4]

Unemployment Rate in Hungary remained unchanged at 4.90 percent in September from 4.90 percent in August of 2016. Unemployment Rate in Hungary averaged 7.81 percent from 1999 until 2016, reaching an all times high of 11.80 percent in March of 2010 and a record low of 4.90 percent in August of 2016. [5]

According to the latest data from the KSH's Labor Force Survey, in the third quarter of 2015 the economically active population in Budapest aged 15-74 was 854 700, the inactive population 482 000. The activity rate rose by 1.4 percentage points, to 63.9%, against the same period of the previous year. The number of people in employment stood at 811 500, which is 23 200 more than in the first half of the previous year and points to a significant increase in employment in the capital. The unemployment rate was 5.1%, 0.3 percentage points lower than the same period of the previous year. The data regarding the unemployment, participation and employment rates are also distinctly more favorable in the capital than the national average, as the unemployment rate was 1.4 percentage points lower and the participation and employment rates 3.5 and 4.1 percentage points higher respectively.

8.2. Description of the transport system

Budapest is a leading city in Central Eastern Europe in the implementation of transport management organizational schemes, in charge of integration of different transport modes, and of building organizational capacity for the implementation of sustainable measures. The population of the wider metropolitan area, incorporating the 81 settlements within neighboring Pest County, is around 2,500,000. Budapest located on the banks of the river Danube in the north of Hungary, Budapest was formed by the unification of the separate settlements of Buda and Pest in the nineteenth century. There are now 9 river crossings linking the hilly terrain of Buda on the western bank, with Pest plateau on the eastern bank. Budapest is recognized as the political, financial and cultural center of Hungary [3].

The Municipality of Budapest has created BKK Budapesti Közlekedési Központ Zrt. (BKK) to act as Transport Organizing Authority. BKK is responsible for integrated transport management, including regional coordination, the development of transport strategy, and the design and implementation of major transport projects. [6]

An extensive public transport network means that the city has a reasonably high modal split between public transport use (60%) and private car trips (40%). Budapest has a large road network (4,500 km), 1/3rd of which is a main road network, with over 1,000 traffic signalized intersections. 1.37 billion passengers/year utilize the public transport network, which incorporates around 4,700 separate stations and stops. Public transport options include bus routes (making up around 40% of total trips), tram routes (with a 28% share of trips), an underground rail system (22% of trips), trolley bus services (5% of trips) and suburban railway lines (a further 5% of trips).

The total length of the public transport network is 3,300 km with almost 2,200 vehicles in operation daily. In Budapest (within the city border) there are 600,000 car trips/working day, and 3.56 million passengers use public transport daily. The whole agglomeration around Budapest (Pest County including 80 settlements) has 800,000 inhabitants and generates 400,000 car trips per weekday, which is two-thirds of all trips. The main transport challenges of Budapest are inner city congestion, parking problems, lack of high quality intermodal interchanges and poor connections between specific parts of the city.

Suburban Railway is a significant challenge for Budapest with respect to ensuring quality of service and attracting more people to use public transport. BKK does have tools in place to monitor the reliability of public transport services and the transport authority undertakes benchmarking surveys. The outsourcing of bus services has been trialed as one approach for addressing service quality problems. Ensuring the comprehensibility of the transport network is a principal objective for BKK, which seeks to ensure that multi-modal travel is made convenient and efficient. Integrated ticketing is in place for public transport, which also covers long-distance trains and coaches that travel into and through the city area. This requires cooperation with transport service operators other than BKK. BKK now have a dedicated safety department and the organization is starting to introduce campaigns on particular aspects of safety.

In Budapest there are several organizations working to provide the best conditions for cyclists or to raise awareness. The cycling related NGO awareness raising activity is also becoming more and more perceptible since the beginning of the previous decade. One of the most successful initiatives is Critical Mass, which draws attention to the importance of cycling and organizes events. The Hungarian Cyclists Club advocates for cyclists' interests since 2002.

The big boom started in 2010, at the same time when BKK was established and started to implement cycling measures. Budapest also invests in cycling education, since BKK participates in the IEE STARS project, which is focusing on empowering schools (pupils, teachers and parents) to engage in cycling. The booming number of cyclists, the increasing length of cycle roads, investments and development in the cycling infrastructure and education and the installation of the MOL Bubi public bike sharing system all have positive impacts on cycling, and help to reach the goal of 10% modal share for cycling by 2020.

The length of the network was 288 km long in 2014, having doubled its length in the previous 17 years. Furthermore, the installation of bicycle racks at main stations and public buildings has been enacted to amend parking and reduce the number of bicycle thefts. Designated cycle paths are painted in red and are marked with two yellow stripes running along the path's sides and a yellow bicycle painted in the middle of the route at some points. Budapest currently does not have sufficient data on the effect of these measures; the general opinion is that they significantly contributed to the increase of the cycling mode share. Further implementation of 20 km of new bicycle infrastructure is necessary annually until 2030 to close network gaps and complete the main cyclist network in Budapest. [3]

BKK is continuously converting the city center road network to be more bike-friendly to support the bike sharing system and cycling in general. In the course of the Heart of Budapest program, new public spaces have been created, limited access for cars has been introduced and the parking spaces have also been reorganized in downtown Budapest. Several bike-friendly measures have been taken such as bike lanes, advanced stop-lines, traffic calming and contraflow bike lanes. In addition, 64 one-way streets have been opened for cyclists from both directions. The daily average number of trips with MOL Bubi bikes is approximately 2,000, which means that only 2% of the cycling trips are carried out by public bikes. To collect GPS data from regular bike users in Budapest, BKK will participate in the 2016 edition of the European Cycling Challenge. Approximately 40,000 km GPS data will be collected from 300 active users.

Demand for goods transport and the output of the transport sector have grown significantly in proportion to the growth of GDP in the period 1995 - 2008. This has caused some negative social and environmental impacts as well. Rail and water transport (for goods) suffered a significant loss of market share during the political changes (1980-1995) while road transport that causes substantial environmental impacts has grown dynamically. (Together with air transport.). Nevertheless goods traffic by rail still accounts for a

25-28% of the total output of the Hungarian goods transport performance. This ratio is higher than the average of the EU28 countries – that is 18,8%. [7]

Tickets are valid for among other things, the metro, buses and the suburban HÉV lines (only within the city limits). The basic ticket is usable for one trip, the transfer ticket is adapted to one transfer trip and the discount coupon book with a 10-trip single tickets is available too. Day and tourist passes offer a good deal for visitors, as they allow unlimited use of the public transportation system and are often packaged with free admission to many museums and attractions. The Budapest Cards can be purchased with a 24-hour, 48-hour or 72-hour validity. All cards include unlimited travel on public transportation, free entry to several museums, two free walking tours, and 10%-50% discounts at participating baths, museums, restaurants and spas. [6]

BKK prepared several tariff regulation modifications, among them the validity extension of 24-hour, 72-hour and weekly passes to include rail and regional bus operator Volánbusz services; monthly passes are available again without the requirement of a photo of the holder as required by certain public institutions. Along with the tariff regulation modifications, one thing remained unchanged: for the first time in 15 years, there was no increase in public transport fare prices in Budapest. BKK, the mobility manager of the city, has put together a practical guide that contains all relevant information for tourists and visitors. Through the handy booklet future customers get the chance to familiarize themselves in advance with the different means of transport, with daytime and night transport network maps. Additionally, the publication sheds light on ticket and pass sales points, on barrier-free accessibility to public transport and on some rules to keep in mind. Also, technological solutions are introduced that help to make journey planning fast and easy.

The BKK has also introduced hundreds of new automatic ticket machines citywide with a goal of easing the process to buy tickets. A bike-sharing scheme as well as the Danube ferries also provide more options for getting around Budapest. Ticket machines can now be used to buy single-use tickets, or monthly, quarterly and yearly passes. The major change relating to travel passes is that an ID number needs to be provided at purchase, regardless of if this is done at a ticket booth or ticket machine. This number will be automatically printed onto the pass instead of being written by hand by the purchaser.

Ensuring the comprehensibility of the transport network is a principal objective for BKK, which seeks to ensure that multi-modal travel is made convenient and efficient. Integrated ticketing is in place for public transport, which also covers long distance trains and coaches that travel into and through the city area. This requires cooperation with transport service operators other than BKK. Over 30 different types of tickets and travel passes are covered, but all are integrated and facilitate multi-modal travel. Steps are also being taken to improve communication with public transport users. BKK also introduced high level passenger orientation systems in the metro underpasses to improve the change experience and help the non-regular users to smooth transfer. While there has been no dedicated survey, feedback about the revised maps tends to be positive. A further important initiative has been the introduction of more than 260 electric signs providing real time information for public transport users. BKK started a new service called BKK info where drivers are advised where there are lane closures or congestion. This information system will be extended to provide a multi-modal journey planner. This is available online and as a smartphone app.

The FUTÁR (Forgalomirányítási és UtasTÁjékoztatási Rendszer) is the modern information system of the public transport network, it serves to show the quickest route. The system continuously monitors the real-time traffic of Budapest, maintains the time schedule transport and interferes in the emergency by the help of the satellite navigation system. The passengers receive information by the FUTÁR display placed on the stations, they can see that when depart the vehicles on the dot. This eases the calculable journey planning. The new displays inform the accidental traffic change besides the direction and the departure time. [6]

8.3. Governance structure and legal obligations

The establishment of BKK was preceded by years of preparatory work. During the course of this process, a team of experts examined the opportunities to renew the clearly outdated and fragmented transport system on an institutional level to remove one of the greatest obstacles impeding transport development and to encourage cooperation between stakeholders, taking into consideration the political, strategical, transport-related, and last, but not least, legal aspects of the planned project. The last occasion when municipal leaders introduced significant changes to the Budapest transport management was at the end of the 1960s, when the Budapest Transport Company was established. The years elapsed since 1990 have demonstrated the shortcomings of that transport management system: it became clear that the democratic market environment notwithstanding, even though transport in Budapest comes under the cognizance of the Municipal Government of the Capital, several serious issues burdened the everyday lives of the city's traveling public. In many cases, this was not the result of a lack of funds, more that of a lack of expert coordination and dedicated, unified leadership, although the individual transport experts themselves were often lead by the best of intentions.

It is a commonly known fact that public transport cannot sustain itself financially anywhere in the world, ticket and pass sales being inadequate to cover the operational costs of such a vast system. This is, as a matter of fact, the reason that public transport is a public service, seeing that if its own revenues could generate profit, it would be able to function under competitive market circumstances. It being a public service, however, it is necessary to compensate for those revenues which are absent due to the characteristics of the system itself. This means mainly state and municipal support in every part of the world, with complementary funding to operate and develop the system coming from a variety of alternative sources.

The establishment of BKK will result in the gradual development of an integrated Budapest transport budget in 2011-2012: state and municipal support, fare revenues and all other transport-related revenues will appear transparently in the budget of BKK, making the funding of everyday operations more predictable. The most prominent of these additional revenues are: those derived from sales of advertising surfaces and the utilization of real estate stock (commercial premises above ground and in the subway); parking-related revenues and freight transport permit fees.

The Budapest Közút Zrt. operates and maintains road surfaces, stations (including disembarking and boarding pavements), road bridges, flyovers and underpasses on roads used by public transport owned by Budapest district local governments (bus and trolleybus). It is continuously monitoring the traffic and the safety parameters of the road networks. It ensures the control tools (65.000 signboards, 280.000 m2 surface-signs and 1000 signaling-junctions) and operates the traffic monitoring system containing 200 cameras. [6]

Although Hungary adapts certain mobility planning action plan, the concept of mobility planning is new. On the system of cafeteria the employer pay the traffic pass; the office blocks advertise themselves with bicycle-shed and shower room for a bicyclist; the public transport is reduced available with the tickets of bigger evens (Forma1, Sziget Fesztival and exhibitions). These arrangements have not a complex method, so the workplace mobility planning adapts on infrequency case. [8]

8.4. Existing strategies

Budapest's existing transport development plan, called the "Budapest Közlekedési Rendszerének Fejlesztési Terve", is revised regularly by BKK. The key aim for the current revision phase is to turn the 2009 Transport Development Plan into a Sustainable Urban Mobility Plan during the next three to five years. This will involve improved cooperation between urban planners and transport professionals, having regard to "Budapest 2030", the long term urban development strategy for the city.

In Budapest's first SUMP-based transport development strategy, called the BMT Balázs Mór Plan, the city set a goal of 10% modal share for cycling by 2030. Its current level is 2.3%. One means to help achieve this is the MOL Bubi public bike sharing system, launched in 2014. BKK launched its MOL Bubi public bike sharing system in September 2014 and it was extended in 2015 due to the first successful period of operation. BKK is also implementing a bike-friendly Bubi area in the city center to support the bike sharing system and cycling in general. Measures taken in the rubric include bike lanes, advanced stop-lines, traffic calming and contraflow bike lanes. These measures will be evaluated in FLOW to see whether they effectively help to meet the city's cycling modal share goals and relieve congestion in the downtown area. [9]

Sustainability objective: The present transport strategy aims primarily to improve the infrastructure of transit traffic, to make it easier to get through the territory of Hungary, to reduce the differences in the levels of development between the various regions of the country, and to improve the accessibility of regions, without, at least so far paying adequate attention to sustainability. The main goals in the frame of sustainable mobility are promoting public transport and cycling, providing accessible infrastructure, and implementing ecological transport technologies. [7]

As an element of its role as integrated transport management body, BKK is also responsible for the management and maintenance of Budapest's network. With around 1,000,000 car trips/day, congestion is experienced in the city center and along some main roads (particularly at the river crossings), but this currently tends to be limited to the morning and afternoon peak periods. It is thought that, overall, congestion levels are decreasing due to a combination of factors, including the impact of the economic crisis over the past few years, as well as the beneficial effect of incremental improvements to public transport. BKK are aware that further information on traffic levels and congestion is required and the organization is planning to implement a traffic counting routine over the next year. This data is expected to inform consideration of measures to further reduce private car trips, such as the implementation of a congestion charge and restrictions on parking within the city center.

With respect to air quality, Budapest has been failing to meet EU standards and therefore a legislative procedure to drive improvements by the city has been launched. One of the main problems is thought to be the age of the public transport vehicle fleet, which have been an average age of around 16 years when BKK formed. The company did several measures to renew the over deteriorated fleet and in results there are 200 used (over EURO V) and 330 new buses running all over the Budapest. Additional to this BKK introduced 28 hybrid and 37 CNG busses to the fleet.

Noise pollution is currently less problematic than the levels of air pollution, and is thought to be decreasing over time thanks to reduced traffic levels. A Noise Map and Strategy was developed in 2008, leading to the investigation of potential measures to mitigate impacts, such as traffic calming (reduced speeds and traffic restrictions), as well as increased pavement widths. The Noise Map is currently under revision. These initiatives would have further additional benefits, such as increased pedestrian safety.

It is considered that the extensive Budapest public transport network already provides good accessibility to services, employment and education within all parts of the city. Nevertheless, a strategy for accessibility will form part of the SUMP that is currently being prepared, meaning there is potential for the identification of new measures and adoption of accessibility standards. To help enhance mobility for disabled persons, public transport measures and services have been implemented in Budapest. Since 2010 the percentage of low-floor busses increased from 25% to 55% (2014) and the aim is that all the busses should be low-floor for 2018. [3]

8.5. Visions and goals

For preparing the SUMP, BKK concentrates on the first five elements of the SUMP circle, which are also addressed in the CH4LLENGE project – participation processes and institutional cooperation. The

development of a common vision, the identification of mobility priorities and goals, and the decision of the key SUMP measures will be put into practice in a participatory approach engaging relevant stakeholders and citizens. Here, strong emphasis will also be on integrating different institutions, sectors and disciplines. Further, Budapest will benefit from the knowledge of the Optimizing Cities and the experiences the cities gain in the project in the thematic areas of measure identification, measure selection, monitoring and evaluation. Lessons learned in CH4LLENGE will help BKK later on in the implementation and evaluation phase of the Budapest SUMP. [10]

The Budapest is bid for the 2024 Summer Olympics and Summer Paralympics. Budapest has been eager to explore the sustainability aspect of the technical planning process. The city already has a series of six coordinated development plans in place, and the Budapest bid has been worked into and around these existing strategies, making extensive use of brownfield sites and restoration of historic buildings. The Budapest Sustainable Development Plan is the result of three years of research and extensive collaboration between all parties with a stake in the city's future, including government departments, NGOs and the general public. The National Council for Sustainable Development is the entity guiding sustainability policy in Hungary. In addition to formal standards, the Budapest bid team have been actively working alongside businesses, institutions, non-profit organizations and the community to develop the Budapest area into a smart city, encouraging investment in capital and infrastructure for sustainable economic growth and quality of life.

Aspects of this work include the Smart City Budapest (SCB) project, the Sustainable Transportation Strategy (including the Ányos Jedlik electro-mobility concept) and the Covenant of Mayors Sustainable Energy Action Plan of Budapest, part of an EU-wide strategy to lower greenhouse gas emissions from cities. The specific projects related to the sustainability strategy that are currently being implemented include the Danube regeneration program, wastewater management works, upgrades to the metro system, improvements to pedestrian and cycling mobility (incorporating the MOL Bubi public bike-sharing project). In addition to the decision on the Olympic locations, the General Assembly of the city has in parallel approved the transport master plan, which outlines other future steps in Budapest's urban development.

These include elements in 'Budapest 2030-Long-term urban development concept and Budapest 2014-2030-Public transport development. The measures include:

- Reconstruction and expansion of the M3 underground line
- Reconstruction of the M1 underground line
- Direct connection between suburban railway lines and the M2 underground line
- Expansion of the H6 (Ráckeve) and H7 (Csepel) suburban lines into the downtown
- Bridge renovations
- Improved motorway access to Budapest's Liszt Ferenc International Airport from downtown
- Motorway development
- Complex redevelopment of the tram system.

Closer to the Olympic Village, for the tram system, the plan is for removal of railway lines in front of the National Theater. This will allow visitors to the Millennium Center direct access to the Olympic facilities on the Danube river bank, via a spacious green area.

The suburban railway line to Csepel would be replaced by a tram running on the already existing tracks of the Tram 2 line, bringing forward a plan to update the old tram carriages in the city center. Another part of the plan is for a bridge linking the southern parts of Pest and Buda with Csepel, finally decreasing the isolation of the island district. [11]

9. Modena (Italy)

9.1. Introduction to the region

The territorial and transport system of the Northern Italian regions is characterized by a strong settlement diffusion, both productive and residential, that correspond to a high density of infrastructures and mobility services. In this contest, Emilia-Romagna Region plays a strategic role for the economic system and for the mobility of people and freight. This role is recognized also from the European Union Guidelines for the development of transeuropean transport network considering three important corridors:

1) Baltic-Adriatic corridor: road and rail axis that has the “core-ports” of Ravenna as terminal point of the corridor itself and Bologna as “node core”;
2) Mediterranean corridor: also in this case Ravenna and Bologna are “node core” and the corridor includes also the waterway of Ferrara;
3) Scandinavian-Mediterranean corridor: Bologna is the multimodal node core of this corridor for the Emilia-Romagna Region.

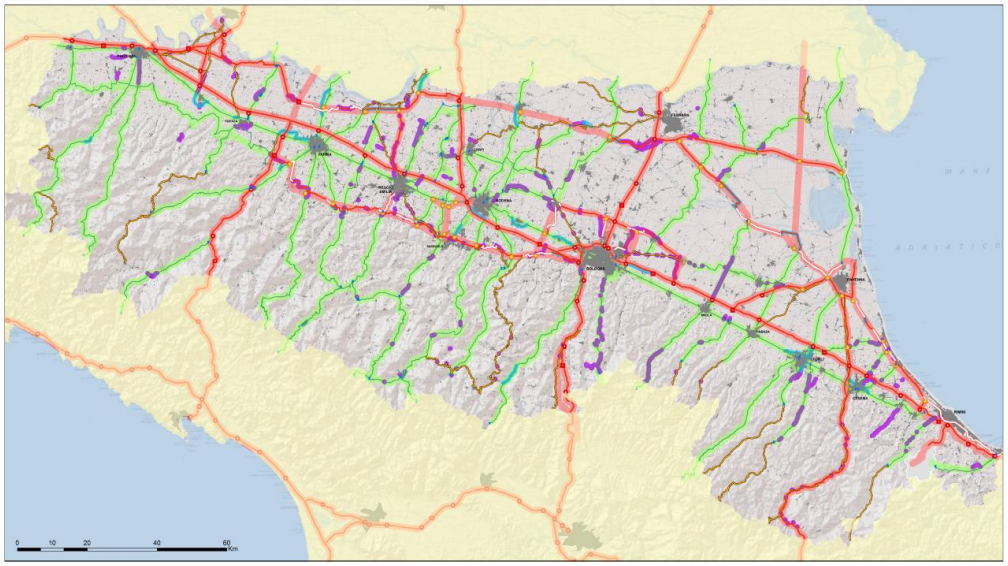


Figure 13 Location and the good equipment of infrastructure

This location and the good equipment of infrastructure (street, highway, railway) allows the Emilia-Romagna Region to reach a high level of accessibility according to ESPON European studies.

The density of in Emilia-Romagna region (about 200 inhabitants/km^2) is higher than the European average (about 116 ab/km2). The share of regional population that lives in the main municipalities is the 38% as explained in the following table.

Table 9 Source: Regional Territorial Plan of Emilia-Romagna

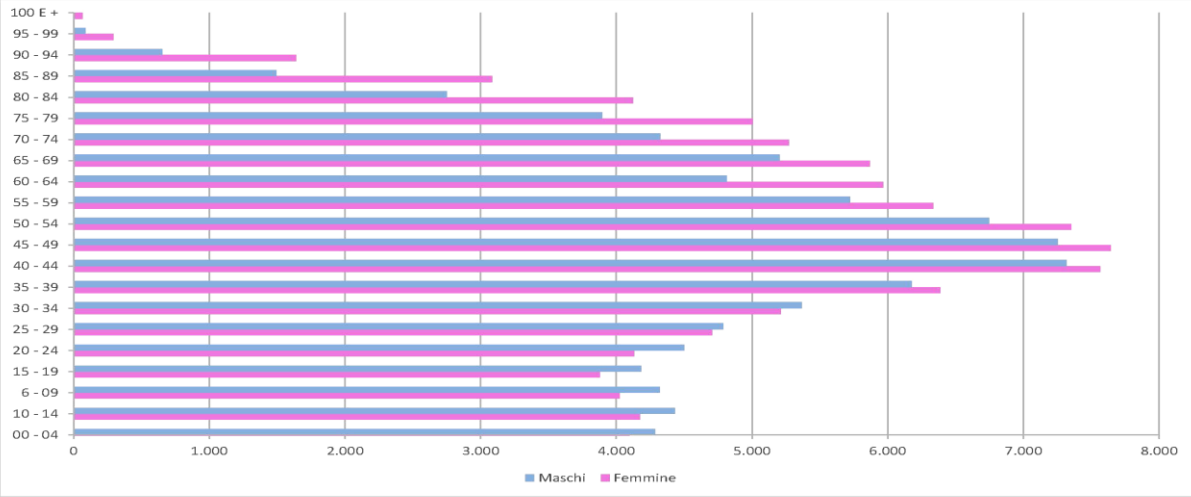
Tabella 1
Popolazione residente in Emilia-Romagna (2014)

Totale residenti per Provincia - aggiornamento 31 dicembre 2014									
Piacenza	**Parma**	**Reggio Emilia**	**Modena**	**Bologna**	**Ferrara**	**Ravenna**	**Forlì-Cesena**	**Rimini**	**TOTALE**
288.620	445.451	534.086	703.114	1.005.132	354.673	393.154	396.696	336.189	4.457.115
di cui residenti in capoluogo									
102.623	189.996	171.869	185.148	386.181	134.063	159.645	215.637	147.971	1.693.133

The city of Modena is one of the main cities in the center of the Emilia-Romagna Region. Its territory is completely flat and the extension is 183.23 km^2. It has about 185.000 inhabitants.

The age-distribution of the population in Modena is detailed in the following table.

Table 10 Guidelines of SUMP



The city area is composed by a central urban area where are located most of the services and of the inhabitants; this is also the area where the public transport runs more frequently and gives a high territorial coverage. There are also 13 hamlets scattered throughout the municipal territory, some km far from the center of the city, but nonetheless connected with public transport.

Considering the development of the urban area of the city in the last century, it is inevitable to find some old industrial and manufacturing sites close to residential areas.

Figure 14 View of the city - Modena

9.2. Description of the transport system

Starting from the National census (2011), the table below explains the modal share in the city of Modena, comparing the same data with the ones at national and regional level and with the data of the Province of Modena and of the near Metropolitan City of Bologna.

Table 11 Modal share in the city of Modena

	share of home-work trips								
	motorcycle	car (as driver)	car (as passenger)	dedicated bus	urban/ extraurban bus	train	bycicle	feet	other
ITALIA	4,16%	66,11%	5,22%	0,52%	4,52%	4,11%	3,72%	11,19%	0,45%
Emilia-Romagna	3,42%	70,11%	4,21%	0,36%	3,93%	1,53%	8,02%	8,01%	0,40%
Prov. Di Modena	1,95%	74,82%	4,84%	0,44%	2,03%	0,90%	7,02%	7,58%	0,40%
Modena	3,15%	67,61%	4,21%	0,50%	4,79%	1,48%	10,38%	7,53%	0,35%
Bologna	10,31%	46,50%	2,92%	0,45%	19,36%	1,74%	6,45%	12,07%	0,20%

Modena Public transport network is composed by 14 urban lines, including 3 trolleybus lines, and several extraurban lanes.

Table 12 Modena Public transport network

Year 2015	Urban lanes Modena	Extraurban lanes province of Modena
bus network [km]	209	1607
trolleybus network [km]	27	-
vehicles*km/ye	4.664.401	6.415.307

Year 2015	Urban lanes Modena	Extraurban lanes province of Modena
ar		
passenger/year	7.919.992	5.302.684
n. Autobus	136	214
n. trolleybus (electric bus)	25	-

The city of Modena has also 2 train stations: the central one is a point of connection of 2 national railways (Milan-Bologna and Modena-Verona). The other one instead is a node core for a local railway bringing to the new hospital and to the south part of the Province. This line has also some stops in the territory of the city of Modena and, consequently, it works as urban railway.

The road network in the territory of Modena is composed by several type of street (highway, extra-urban and urban street) for a total amount of 867,9 km.

Table 13 The road network in the territory of Modena

Strada	Cat.	km
Autostrada A1	A	20,2
Tangenziali Nord e Sud	B	35,1
Principali Strade Extra-Urbane	C	66,3
Rete di Distribuzione Urbana	D,E	144,9
Strade Comunali locali e private	F	601,4
	Totale	**867,9**

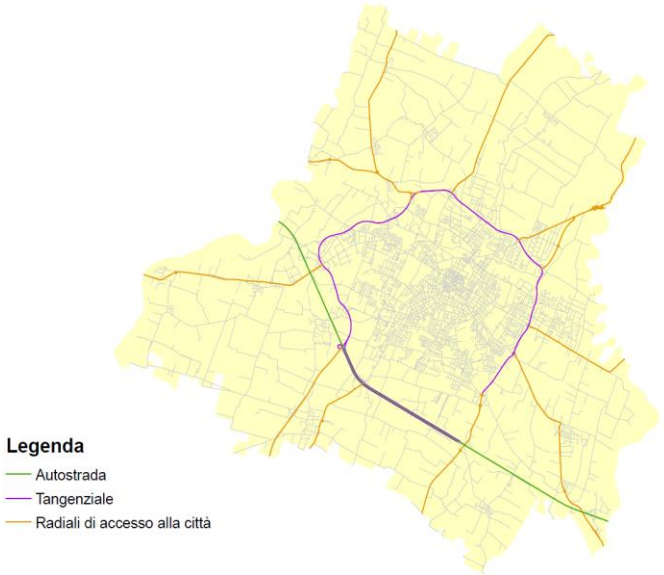


Figure 15 The extra-urban network

The extra-urban network connects the city of Modena with 10 smaller towns in the neighborhood. The Modena cycling network is one of the bigger among Italian cities with its 216 km of bike lanes.

Table 14 Modena cycling network

Type of lanes	Length [m]	Percentage
Cycle lane	27.562	12,8%
Cycle-pedestrian lane	90.489	41,9%
Cycle lane near to pedestrian lane	39.308	18,2%
Park	13.853	6,4%
Natural lanes	39.786	18,4%
Urban local street	3.476	1,6%
Underlanes	1.379	0,6%
Intersections	297	0,1%
Total	**216.150**	**100,0%**

The following table resumes the number of daily trips of the population, comparing the same data with the ones at national and regional level and with the data of the Province of Modena and of the near Metropolitan City of Bologna.

The urban public transport counts about 8 million passengers, and the extra urban lines more than 5 million, as detailed in the table below.

Table 15 Daily trips in Modena

	Inhabitants that have daily trips		
	study	homework	total
ITALIA	9.699.433	19.172.014	28.871.447
Emilia-Romagna	660.633	1.643.782	2.304.415
Prov. Di Modena	110.794	263.495	374.289
Modena	29.278	68.383	97.661
Bologna	50.995	138.069	189.064

Servizio	2014	2015
Urbano Modena	7.539.884	7.919.992
Extraurbano	5.015.656	5.302.684
Prontobus	70.640	67.456
TOTALE	**12.626.180**	**13.290.132**

For each working day during the school period, the main railway in the city of Modena counts an average of 8.341 people, while the provincial railway counts about 2.450 users.

9.3. Governance structure and legal obligations

The planning of Public transport lines and stops is managed by the City of Modena, by the Department of Environment, Civil Protection, Mobility and Territory Safety, with particular reference to the Mobility and Traffic Service that daily has also to: analyze the condition of traffic; to find solution in case of problems

connected to traffic flows; mainly propose new strategies to boost sustainable mobility trough new forms of planning of usual trip.

Public Transport management is made by SETA, the transport company of the provincial territory of Modena and of other 2 cities in the Emilia-Romagna Region: Reggio Emilia and Piacenza.

Beside SETA, since 2001, as requested by the Emilia - Romagna Region reform of Local public transport (LPT), the Mobility and Traffic Service of the City of Modena, together with the Province of Modena and all other local authorities, entrusted the Modena Agency for mobility and local public transport (aMO), which is the link between the municipality and SETA, with the following tasks: planning, organization and promotion of LPT.

For what refers to the mobility planning, the Italian National law (D.M. del 27/03/1998 of the Minister for Environment) foresees that companies and public entities, with individual local units of more than 300 employees, and companies with more than 800 employees, located in municipal areas at risk of air pollution, have to adopt a Plan for home-work trips for their workers, therefore identifying a manager responsible for company mobility.

The Plan aims at reducing the use of private individual transport vehicles and at improving the organization of time to limit traffic congestion.

The above mentioned National law also foresees the institution by the municipalities of structure for the support and coordination of company mobility managers, able to keep and manage the links with city administrations and transport companies.

9.4. Existing strategies

At the moment, the City of Modena has not a local SUMP, but it will define, develop and adopt one by the end of 2017.

The SUMP will refer to the entire urban area. Nevertheless, it is important to underline that, in some cases, the planning of a service or of interventions (for example, the LPT) has impact also on the suburban area.

The SUMP should contain measures to increase the sustainable trips share, improving different measures on the territory of Modena, and also defining some measures to monitor the efficiency of the plan.

The SUMP will have a time frame of at least 10 years and it will refer to several areas of interventions: building and maintenance of road infrastructures; bike lanes/paths; urban freight distribution; Limited Traffic Zones; 30 km speed zones; traffic management; sustainable means of transport as electric cars, electric bike sharing, bicycle, walking, LPT, etc.; park and ride areas; parking areas management; impact of transport and mobility on air quality and old cultural heritage, as UNESCO site.

The development of the SUMP will also be based on the involvement of citizens and local stakeholders in the definition of the urban mobility strategy.

In preparation of the SUMP, the Mobility and traffic Service has recently approved the Guidelines of the Sustainable Urban Mobility Plan, that contains an updated complete framework of the city, about all the elements related to territory, environment, local services to citizen, offer and demand of transport.

At the same time, the Mobility and traffic Service is elaborating a specific Plan for cycling mobility, that contains several analysis about the state of art, and projects proposal for short and long time.

For the short time (2 years: 2016-2018) the Cycling Mobility Plan propose to solve “black points” (where the majority of accident occurs), to design and implement new dedicated cyclist infrastructures, that are already financed, including 2 new bridges for cyclists and pedestrians on the Rivers Tiepido and Panaro.

Moreover, the Plan proposes to solve the inconsistency of the vertical signs, to guarantee the uniformity of the lane and to potentiate the service to increase the attractiveness and the safety of bicycles.

In the first 2 years, the City proposes to increase +25% the km of streets with limited speed 30km/h.

For the long term (10 years) the Cycling Mobility Plan proposes to complete the major "cycleways" that represent the structural network of the city of Modena, in which some tails are not built, and also to build up 27 new cycle lanes. Other actions included in the Plan are the cycle reconnection with the suburban hamlets, the reconversion of a disposed railway in a sustainable corridor, the further increase of 30km/h lanes and of bike service.

At the moment the city of Modena doesn't have any mobility plan for civil servant.

9.5. Visions and goals

For what refers to the City of Modena, the Administration is starting with the elaboration of the new PSC (City Structural Plan), and considering the guidelines of the Administration, four are the main references:

1) address the new PSC towards a less consumption of soil, reconsidering the previsions on settlement, not yet implemented;
2) address the PSC towards the promotion of urban requalification processes, considering also the energy efficiency and the safety operations, regarding obsolescent building heritage;
3) Consider again the system of settlement equal distribution towards a major effectiveness and sustainability;
4) Further promote the agricultural landscape and periurban rural space as essential element of settlement and environmental quality of the city of Modena.

Strategies for the elaboration of the Plan are the following:

- territorial dimension of the Plan and its capacity of considering the relations between the city and the "extended area", which means the relations among Modena and the neighboring municipalities;
- time dimension of the Plan, adopting a planning timeframe of ten years, considering, at the same time, the need and the urgency of defining short or medium time actions;
- integration among territorial, environment and mobility policies, considering the environmental sustainability (reduction of the consumptions of non-renewable energy resources, of greenhouse gases, of pollutants, of traffic noise emissions, etc.) and the efficient mobility as objectives;
- optimize and integrate infrastructures and services of long mobility networks (provincial and regional area) with the short mobility networks (urban and extended area), both for passenger and freight mobility;
- quality of the public space as an element for orienting mobility policies, considering two main themes: accessible cities for all for what refers both to the public space planning and to the access to mobility services; cities without victims of road accidents, where spread speed limitations allows all road users (pedestrians, cyclists, LPT users, etc.) to safety access to public spaces;
- encourage the use of transport means of less environmental and social impact (walking, cycling, LPT, etc.), taking into consideration the need of using financial resources in a more efficient way, in order to finance new works, but also for the maintenance of present systems;

- reduce the need of using the car for short trips, thanks to measures decreasing the motorization in the City and the sharing of vehicles (car sharing, car pooling, etc.);
- promote behavior of citizens and of the community of operators towards the respect of traffic circulation rules (respect speed limits, accessibility of some territorial zones, etc.) and of the rules for accessing services;
- promote the use of technologies applied to the system of passengers and freight mobility;
- become a test city for ISA (Intelligent Speed Adaptation) applications, checking implementation barriers and social acceptability conditions and considering that these applications will contribute to accident and motorized reductions, even if they need to be verified and concretely tested.

With reference to the SUMP, its strategies have been elaborated, both technically and politically, by the City of Modena Administration.

The SUMP adoption implies: the start of a process for sharing strategies with the local community; the definition of measures in the medium and long period; the implementation of an ex-ante evaluation referred to the scenarios of the Plan, in compliance with the achievement of the objectives; the quantification of financial resources necessary to the implementation of planned interventions; the conclusion of the procedure for the adoption of the Plan, harmonizing and integrating this Plan with the other territorial and environmental tools, that, at the moment, are under development.

The SUMP will foresee objectives both for private and public transport mobility

- Private Mobility: improving the system of cycling and pedestrian lanes; improving the road systems; extending the 30km speed zones; promoting electric vehicles; developing freight transport thanks to environmental friendly vehicles in the urban area, in particular, within the limited traffic zone.
- Public transport Mobility: improvement of LPT, thanks also to an extension of the services territorial coverage, the reliability and punctuality of routes and through preferential bus lanes and traffic lights; development of intermodality; enhancing LPT accessibility; renewing LPT vehicles; completing the intermodal and rate system at regional level; implementing mobility management actions; promoting agreements among or inside companies for more efficient home-work journeys, enhancing the use of environmental friendly means of transport; identifying innovative technological systems for mitigating environmental and landscape impacts.

SUMP main contents are also in line with the Energy Roadmap - Modena 2050" adopted in the frame of the European Project IIMAGINE, financed by the INTERREG IV C programme.

10. Ljutomer (Slovenia)

10.1. Introduction to the region

Slovenia (official name: Republic of Slovenia) is a European country with a geographical location in the far north of the Mediterranean and in the extreme south of Central Europe. Slovenia borders on Italy in the west, Austria in the north, to the northeast by Hungary and the east and south with Croatia. It lies at the junction of the Alpine, Mediterranean, Pannonia and Dinaric worlds. Area 20,273 km^2 ranks Slovenia among the medium-sized European country. Length of the state border is 1,382 km, of which 921 km of

land, 413 km inland and 48 km sea borders. Slovenian Adriatic coast is 46.6 km. The capital city is Ljubljana, which is the economic, cultural and political center.

The majority of Slovenian transport system consists of about 15,000 km of roads, 1,200 km of railways, 3 airports and one international port. Road traffic is growing at an annual rate of 3-4% and about 90% of all transport (goods and people) take place by road. In the context of the National Motorway Construction Programme was built 236 km of motorways, 323 km are under preparation or construction. Railways comprise about 1200 km, of which only 500 km are electrified. Most railways were built in the 19th century and therefore are not suitable to meet today's needs.

Source: Trajnostna mobilnost

Its geographical location and historical circumstances make Slovenia an intensively transport and transit area and the crossroad of two major pan-European corridors, i.e. corridors V and X, which were determined at the European conference of transport ministers on Crete in 1994 and in Helsinki in 1997 (CEMT – Conférence Européenne des Ministres de Transport). This division is mentioned because it is most familiar in Slovenia.

The corridors run as follows:

Corridor V: Venice – Trieste/Koper – Ljubljana – Maribor – Budapest – Uzhhorod –Lviv – Kiev,

Corridor X: Salzburg – Ljubljana – Zagreb – Belgrade – Niš – Skopje – Veles –Thessaloniki; the corridor Xa also runs across Slovenia, i.e. Graz – Maribor –Zagreb.

In Slovenia, the trans-European network or TEN-T, this is divided into a comprehensive and core network, runs on the same routes as the aforementioned pan-European corridors.

10.1.1. General description of the region

Pomurje is located in the northeast of Slovenia and borders on three countries - Austria, Croatia and Hungary. It consists of the subregions, Prekmurje on one side of the river Mura and Prlekija the Styrian part on the other side. Pomurje's plains, which are part of the Pannonia plain, are surrounded by hills of Goričko, Lendava hills and Slovenian hills. Pomurje is a meeting point of different cultures and religions (Catholic and Protestant Church) and ethnic groups, because here staying Roma and Hungarian minorities. The climate is predominantly continental-Pannonian, partial effects of the Mediterranean climate. The region has three protected areas, in addition to the Nature Park Goričko also Landscape Park Ljutomer Ponds – Jeruzalem hills and Landscape Park Negova. Administratively it is divided into 27 municipalities.

Incentives (subsidies) to public passenger transport: the use thereof in the Pomurje region is virtually impossible because of irregular lines. Railway connects only Goričko – Murska Sobota -Ljutomer, while the so-called area 'Valley' is without rail links (direction of Lendava).

10.1.2. Population

Slovenia had in the first half of 2016 2.064.188 inhabitants, in Pomurje 116.078 inhabitants. Thus, in Slovenia, in the first half of 2016, 1.956,722 citizens lived in Slovenian and 107.766 foreigners. In Pomurje was in the same year 114.321 Slovenian citizens and 1.757 foreigners.

Population density was in Slovenia in the first half of 2016 101,8, while it was 86,8 in Pomurje. Also the natural growth in Slovenia in the first half of 2016 was 807, in Pomurje 350.

10.1.3. Municipalities of the region

In Pomurje there are 27 municipalities: Apače, Beltinci, Cankova, Črenšovci, Dobrovnik, Gornja Radgona, Gornji Petrovci, Grad, Hodoš, Kobilje, Križevci, Kuzma, Lendava, Ljutomer, Moravske Toplice, Mestna

občina Murska Sobota, Odranci, Puconci, Radenci, Razkrižje, Rogašovci, Sveti Jurij ob Ščavnici, Šalovci, Tišina, Turnišče, Velika Polana, Veržej.

Mostly of them are small, only Murska Sobota is the city municipality, the rest of them are ordinary municipalities. The size of the Slovenian municipalities is specific characteristic in Europe. Due to some political reasons Slovenia doesn't have region by law, only the statistical region which are not operational enough and don't have political sovereignty to establish the legal laws and acts or legal bodies. There are only informal regional councils which are taking care for preparing the Regional development strategies for specific region for easiest funding within European territorial cooperation programmes.

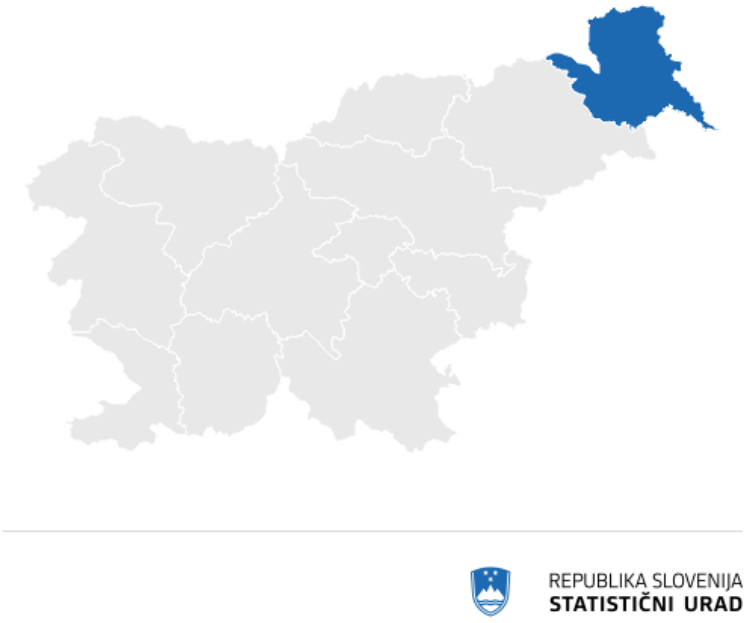


Figure 16 Slovenia - map of the region

Figure 17 Typical pictures of the region

10.1.4. Population and economy

In Slovenia, there were at the end of July 2016 99.117 registered unemployed persons, which is 678 person or 0.7% less than in June, compared with July 2015 the unemployment was down by 9.5%.

In the region Pomurje there was at the end of July 2016 7.681 registered unemployed persons, what is 11.6% less than in July 2015.

Age distribution is given below.

Table 16 Demographic factors, Slovenia 2016

Average age (years)	42,7
The aging index	124,1
The proportion of the population aged 0-14 years (%)	14,8
The proportion of the population aged 15-65 years (%)	66,7
The proportion of the population aged 65 and more (%)	18,4

Source: www.stat.si

Table 17 Demographic factors, Pomurje 2016

Average age (years)	44,5

The aging index	151,2
The proportion of the population aged 0-14 years (%)	13,2
The proportion of the population aged 15-65 years (%)	66,9
The proportion of the population aged 65 and more (%)	19,9

Source: www.stat.si

10.2. Description of the transport system

At country level, there was a noticeable shift in the modal shares from 2009 to 2014 in Slovenia.

Between 2009 and 2014, the share of road in total inland transport performance dropped by 8, 2 pp in Slovenia over this period.

From 2013 to 2014, the share of road fell by 1, 2 pp. As there is no (or only minor) inland waterways transport in Slovenia, the decrease in the share of road was directly reflected in a corresponding increase in the share of rail.

Source: http://ec.europa.eu/eurostat/statistics-explained/index.php/Freight_transport_statistics_-_modal_split

Passenger transport shows that the use of private vehicles prevails; 8% of journeys are taken by public passenger transport, 5% by bicycle and 18% walking. Modal split is comparable to Germany. More journeys in Slovenia are taken by private vehicle, since Slovenia has a lower level of urbanization and there are no major cities; however, there are many small, fragmented and dispersed settlements. More journeys by private vehicle are undertaken in small settlements, and fewer journeys in large settlements.

Document TRANSPORT DEVELOPMENT STRATEGY IN THE REPUBLIC OF SLOVENIA shows how the transport modes are chosen for destinations in 9 major Slovenian cities and departures from them. The use of private vehicles prevails everywhere, since 85% to 97% of all journeys are taken by car and by public passenger transport only 3% in Koper to 15% in Ljubljana. We can establish that private vehicle is the dominant transport mode in Slovenia, which is also the consequence of settlement, high motorization level, relatively unattractive public transport and the insufficient or non-systematic implementation of sustainable mobility measures at the national and local levels. Freight transport: The use of road also prevails in freight transport. In Slovenia, 23% of transportations are on railways and 77% by road.

Source: TRANSPORT DEVELOPMENT STRATEGY IN THE REPUBLIC OF SLOVENIA

The existing Slovenian rails, which were mostly built in the 19th century, are out-of-date and can't compete with the motorway network. The maintenance and modernization of the Slovenian railway network has been neglected due to the lack of financial assets, creating bottlenecks. Nevertheless, it has been gaining momentum with the completion of the motorway cross. The Slovenian Railways company operates 1,229 km (764 mi) of 1,435 mm (4 ft 8 1⁄2 in) standard gauge tracks, 331 km (206 mi) as double track, and reaches all regions of the country. The network comprises main lines and regional lines. Electrification is provided by a 3 kV DC system, except at the junctions with railways of foreign countries, and covers 503.5 kilometers (312.9 mi). Due to the out-of-date infrastructure, the share of the railway freight transport has been in decline in Slovenia despite growing slightly in absolute terms. The railway passenger transport has been recovering after a large drop in the 1990s. The Pan-European railway corridors V and X, and several E-railways (E65, E67, E69, and E70) intersect in Slovenia. All international transit trains in Slovenia drive through the Ljubljana Railway Hub, and all international passenger trains stop there.

Source: Slovenian Railways

The beginnings of the bus transport in Slovenia date back to the early 20th century, when Slovenia was part of Austria-Hungary. The first two bus routes, between Gorizia and Postojna and between Idrija and Logatec were opened in 1912, with additional four opened before World War I. The length of bus lines was 295 km (183 mi). The transport was primarily organized by the Post Directorate of Austria. The total length of bus lines at the end of the mid-war period was 2,893 km (1,798 mi).

After the end of World War II the bus traffic drastically developed. In 1946 the state ministry of local transport in the People's Republic of Slovenia established the National Bus and Transport Company of Slovenia (Državno avtobusno in prevozniško podjetje Slovenije, DAPPS). In 1948 the company was reorganized to another company named Slovenija avtopromet (SAP) with branches across the country, some of which were later transformed to independent local bus operators. The bus transport gradually replaced the railway transport and became the predominant means of public transport in the 1960s. The bus lines reached over 20,000 km (12,000 mi) (1 km/km2), with 26 million passengers altogether.

Today the bus traffic is the main means of public passenger transport in Slovenia, particularly in towns. The main bus stations are in Ljubljana, Maribor, Celje, and Kranj. The bus transport and the public transport in general have steeply declined in Slovenia in the 1990s, particularly in the western part of the country. They are used mainly by people who don't have other choice. Most people travel with their own car.

With the share of over 80%, the road freight and passenger transport constitutes the largest part of transport in Slovenia. Personal cars are much more popular than public road passenger transport, which has significantly declined. Motorways and expressways, operated by the Motorway Company in the Republic of Slovenia, are the state roads of the highest category. On motorways and express ways, cars must have a toll sticker. Slovenia has a very high motorway density compared to the European Union average. The first highway in Slovenia, the A1 motorway was opened in 1972, but the construction was really speed up in 1994, when the National Assembly enacted the first National Motorway Construction Programme. Till February 2012, a network consisting of 528 km (328 mi) of motorways, expressways and similar roads has been built. Its essential section, the Slovenian Motorway Cross, which is part of the Trans-European Road network, was completed in October 2011. It comprises the motorway route heading from east to west, in line with the Pan-European Corridor V, and the motorway route heading in the north-south direction, in line with the Pan-European Corridor X, part of which is considered the Slovenian transport backbone. The newly built road system slowly, but steadily transforms Slovenia into a large conurbation and connects it as a unitary social, economic and cultural space, with links to neighboring areas. In contrast, other state roads, managed by the Slovenian Infrastructure Agency (until January 2015 named Slovenian Roads Agency), have been rapidly deteriorating due to neglecting and the overall increase in traffic. About half of them are in a bad condition. The urban and suburban network served by buses is relatively dense.

There are two types of highways in Slovenia. Avtocesta (abbr. AC) are dual carriage way motorways with a speed limit of 130 km/h. They have green road signs as in Italy, Croatia and other countries. A hitra cesta (HC) is a secondary road also a dual carriageway but without a hard shoulder for emergencies. They have a speed limit of 110 km/h and have blue road signs.

Since 1 June 2008 highway users in Slovenia have been required to buy a toll sticker (Slovene: vinjeta). This system was investigated by the EU Commission that it was unfair upon holiday makers and other non-Slovenian users of the highway system. On 28 January 2010, after short-term stickers were introduced by Slovenia and some other changes were made to the Slovenian toll sticker system, the European Commission concluded that the toll sticker system is in accordance with European law.

According to the Slovenian Motorway Company Act valid since December 2010, the construction and building of highways in Slovenia is carried out and financed by private companies, primarily the Motorway

Company in the Republic of Slovenia (Slovene: Družba za avtoceste v Republiki Sloveniji, acronym DARS), while the strategic planning and the acquisition of land for their course is carried out and financed by the Government of Slovenia. The highways are owned by DARS.

Source: Slovenian Highways

Municipal roads are roads with public road network characteristics which are operated by municipalities. These also take care of their construction and maintenance. They are divided according to the categorization of municipal roads taken by the municipality. Among municipal roads local roads are included as well (over 13,860 km) and public paths (over 18,500 km).

Regarding that Slovenia on a scale of development of cycling in the EU is not in the last quarter, it resolved it that the data for 2012 by the European Cyclists' Federation account in its 2013 issued report, is the country in which it was sold more wheels per capita in the EU. We took it solid also in terms of tourism development of cycling, while Slovenia is per share of the wheels of the way, and the activities and impact of cycling organizations on transport policy in the last quarter of the EU Member States. Regarding development of cycling as an integral part of the transport system Slovenia is after the Hungary, Czech Republic and Slovakia in society cycling undeveloped Mediterranean and the Baltic countries.

Cycle areas in the Republic of Slovenia are mainly unlinked. Starting points for the fulfilment of plans in this area are relatively small, but the national strategy and transport policy encourage the development of non-motorized transport, cycling infrastructure and use bicycles wherever possible and appropriate. Individual settlements and cities in Slovenia mostly haven't provided sufficient and adequate and interconnected cycling connections to ensure the safe use bicycles to carry out daily routes throughout the village and its surroundings.

In Slovenia there is no one-stop-shop information center for cycling. It is even not known how many kilometers of cycling lines exist in Slovenia. Unfortunately no one has already collected such information, which will be valuable info not only for the statistic, but also for the planning and strategic process.

In the last decades Slovenians are travelling greater and greater distances to commute to work and school. This statement is supported by the census data from 1981, 1991, and 2002 as well as the statistical registers that keep the workers' information on the place of residence and place of work. Despite greater travelled distances, the travel time has been constant in the last twenty-five years. At first glance this realization is exciting. The possibility to overcome greater distances on a daily basis expands the commuters' choice of jobs and schools, but also shopping centers and options for daily trips. This indirectly increases the quality of life. However, a more detailed analysis reveals the negative sides of the described progress. The public transport speed has been constant in the examined period. Its users have therefore not gained anything; not only that, their travel times are now slower than commuters in automobiles. The difference in automobile and public transport speed has constantly grown in the past decades. This is predominantly a consequence of motorway infrastructure construction and a simultaneous neglect of railways. With this, the public transportation system has become less competitive with time and its services have decreased because of less demand. The decreased competitiveness of the public transportation system has also led to a drastic decrease of its use: the percent of daily commuters to work with the public transportation system has decreased from 58% in 1981 to 10% in 2002 and the percent of automobile commutes has increased from 27% to 85% in 2002. The increase in automobile use has a negative impact on the environment. In addition, the increased dependence on automobiles has led to fewer public transport services and has also had negative social consequences. Those inhabitants who cannot afford to use an automobile due to health, financial, or other reasons are witnessing a decrease of their accessibility to work, education, treatment, and recreation. This contributes to greater social exclusion in society. There are great regional differences in daily mobility changes in Slovenia. These differences are on the one side connected to the economic development and on the other to different

measures of the traffic policy. The analysis of regional differences and individual good practices enables coordinated spatial and traffic planning that will promote sustainable forms of mobility.

Source: Daily commuters in Slovenia

In Slovenia, the total number of public transport users over the years significantly has been lowered. The most commonly reason for not using public transport is the timing ineffectiveness transit lines, which in this way prevents the public transport to be competitive transportation by car.

In Slovenia there are only two modes of public transport namely bus and rail transport. Said subsystem of public transport in Slovenia are developing incoherent and not integrated, and instead of promoting the use of public transport every network themselves struggling to obtain state funding, leading to inefficient transgression within each network and also in the combination of the two networks.

Table 18 Public transport in Slovenia, 2014

	Number of passengers per year
Road public transport	26 708 000
Rail transport	14 837 000
Air transport	1 113 000
Airport transfer	1 320 000
Shipping port	87 000

Source: Statistical Office of RS

In Slovenia there is a big variety within the public transport system. On the national level there is no common regulator, only Ministry of Infrastructure takes care of information, and legal basis. So, a lot of regulation depends on city level itself. On the regional level there has not been achieved almost nothing since Slovenia does not disposal with the regions. Many private public transport operators take a lead role in providing the transport options between cities and regions. Since this is not the making profit operation due to car increase, and bigger distance, and ineffective lines and timetables, the operators have started to decrease the lines and the time plans became useless for the commuters. Group Arriva Slovenia is the biggest group of transport companies in Slovenia, providing passenger transport services in urban, suburban and interurban areas, as well as transport services on request and for various institutions. Also a high market share Arriva achieves with its tourist activities. However, a lot of regional public private operators have start thinking more green and efficient and have integrated into the fleet more electrical and smaller busses. Another point of view is the long distances between villages, mostly in the sparsely populated part of the regions. In Pomurje region, for instance, many commuters have switched to the cars as the operators couldn’t adapt to the new situation.

The major cities, such as city municipalities develop their own public local transport system. City such as Celje, Velenje, Gorica, Kranj and Murska Sobota (in Pomurje the biggest city) have local busses to connect hinterlands (the villages that belong to the city municipality) with the core city center and shopping areas. The most integrated and well operated system is in Ljubljana, the capital city of Slovenia.

In Ljubljana passenger transport is provided all days of the year; the extent is only reduced during the vacation season and on holidays. Up to 200,000 passengers travel every day.

The whole network of LPP lines covers a large part of the central Ljubljana region. Reliably, comfortably and affordably LPP takes passengers around the City Municipality of Ljubljana as well as to Borovnica, Brezovica, Vrhnika, Logatec, Horjul, Dobrova (Polhov Gradec), Medvode, Vodice, Mengeš, Cerklje na

Gorenjskem, Ivančna Gorica, Grosuplje, Videm / Dobre polje, Škofljica, Iška vas and Gorenja vas (Poljane). Transport on regular lines takes place according to the published schedules, which may change with respect to any major events and vacations or holidays. The network of city passenger transport lines covers approximately 93% of the urban area of MOL, meaning that 93% of households in Ljubljana are less than 500 meters away from the closest bus stop, which is the European standard.

Table 19 Statistical data

City passenger transport	No. of buses (01/01/2013)	Equipment of the buses	Average age
No. of lines: 42 Length of the lines: 502.88 km Different Users of Urbana Card / on yearly basis: 556.901 Increase of Users in relation to the Year 2013: 0,7% Trips made: 39.838.151 Most passengers travel via: Line 6	214	- 216 vehicles with the Urbana electronic payment system - 192 vehicles with air-conditioning - 123 vehicles with a video surveillance system - 192 vehicles with an area for prams and persons with disabilities - 121 vehicles with audio announcers, making travelling easier for the blind and partially sighted - 137 vehicles with wheelchair access for the disabled and passengers with prams - 176 vehicles with internal displays above the driver - 204 vehicles with external displays for better visibility of the line number - 156 vehicles with 568 GEM digital screens for broadcasting news	10,51 years

Interurban passenger transport	No. of buses (01/01/2013)	Equipment of the buses	Average age
No. of lines: 30 + 3G Length of the lines: 677 km + 25 km 3G Passengers transported: 3.231.760 Increase of Trips in relation to the Year 2013: 33,96% Most passengers travel via: 3G and Vrhnika	61	- 62 vehicles with the Urbana electronic payment system - 62 vehicles with air-conditioning - 12 vehicles with video surveillance system - 2 vehicles with wheelchair access for the disabled and passengers with prams	8,98 years

Source: http://www.lpp.si/en/public-transport

The Ministry of Infrastructure is carried out integration of public transport at the national level, which will connect the rail passenger transport, public scheduled bus services and urban transport. For users will certainly essential to establish a single ticket that will allow for certain areas using long-distance bus, train or public transport. Switch between different modes of transport will be further facilitated by unifying schedules and improved passenger information system. Improving accessibility by public transport will be supported by various information campaigns, education and public awareness of the importance of

sustainable mobility. The project is one of the activities of the Ministry of Infrastructure, which also contributes to the realization of the Resolution on Transport Policy of the Republic of Slovenia.

The system will be first able to try by students; a ticket will get into the force on 1st of September 2016, for the others on 1st of October 2016.

10.3. Governance structure and legal obligations

The state provides public regular passenger transport other than public regular transport in urban transport as a public good with economic and public service on the basis of a public tender awarded concessions to favored bidders services.

The Government of the Republic of Slovenia determined by the concession act concession area, the type and scope of services, the method of provision, the conditions for ensuring standards of accessibility to public regular transport, transport prices and quality of transport services and other elements of the concession act in accordance with the law.

The Directorate before granting concessions determines the need for transport (timetables) during the calendar year and not more than twice a year with the schedule changes it into line with the actual needs of the transport.

The establishing and implementing single ticket it is managed by Government of the Republic of Slovenia.

Source: Jože Veren

The Ministry of Infrastructure is responsible for transport in the Republic of Slovenia, established for the implementation of tasks in the field of rail, air, transport and maritime transport, navigation on inland waterways and road transport, except the safety supervision of road transport, tasks in the field of transport infrastructure and cable installations, tasks in the field of the energy sector and mining, and tasks in the field of efficient use and renewable energy sources.

Source: Transport Development Strategy in the Republic Of Slovenia, 2014

In Slovenia there is no legal obligation for workplace mobility plans to be developed. There are some particular cases which stand out but still not promoted enough to be recognizing as the best practices.

Below it is the list with the Slovenian experiences with the workplace mobility planning.

- Underuse potential of mobility management in planning and design, there is no legal bases.
- Neglect accessibility in practice planning and architectural design.
- Strategic planning foresees sustainable solutions that are lost with detailed planning.
- Unawareness of the importance of access by public transport to major traffic generators.
- A large proportion of public investment in the provision of parking facilities.
- Unawareness affects parking supply on the traffic situation in the cities.
- The financing and knowledge come from EU projects.
- Type of foreign manuals for making MP, which are not adapted to our conditions.
- The law does not provide such plans.
- Low motivation of businesses to cooperate.
- Not ready for real change.
- Parking investment tax relief for new construction are promising subject for the future.

10.4. Existing strategies

Integrated transport planning at local and national level in Slovenia does not have the tradition, but in recent years things are moving better. More and more municipalities are responding to incentives of the EU and the Ministry of Infrastructure (MZI), prepare and implement a Sustainable urban mobility plans (SUMPs), which are a key tool of sustainable urban mobility planning.

Ministry for Infrastructure, responsible for transport in the country, has identified the key problems in the field of sustainable mobility and approach to the plan to solve this problem by using the cohesion funds. Therefore, in the Operational Programme for the implementation of the cohesion policy for the period 2014 - 2020 under the priority axis for promoting low-carbon strategies for all types of territories, in particular urban areas, ranked measures of sustainable mobility. It is mainly used for making SUMP of at least 30 municipalities with settlements with urban character and for the implementation of these strategies, such as the regulation of safe access to stations and public transport stops, organization stands and shelters for bicycle parking system P + R ('park and ride ") arrangement public transport stops and sidewalks and bike lanes. In addition to the infrastructural conditions for sustainable mobility appropriate measures of mobility management will be developed and implemented, such as sustainable parking policy, making mobility plans, institutions, limiting traffic in city centers, urban green logistics, the use of modern technologies for efficient mobility management and educational awareness-raising activities on sustainable mobility. It is also important the training for developers of SUMP provided by a Ministry in cooperation with the Slovenian platform for sustainable mobility. This training reached an idea and the concept of sustainable mobility planning to be transferred to approximately 70 experts in the fields of transport and spatial planning, who are now certified for SUMP development.

Currently there are 65 SUMP under development. Mostly city municipalities and small cities with the urban character will benefit from SUMP. The first SUMPs are to be expected in March 2017.

In Slovenia there is only one transport development plan, which has been developed on the national level in 2014. The document is titled Transport development strategy in the Republic of Slovenia.

Slovenian institutions already developed and adopted mobility plan:

- Ministry of Foreign Affairs
- Faculty of Economics, University of Ljubljana
- The Ministry of Transport
- Faculty of Chemistry and Faculty of Engineering, University of Ljubljana (under development)
- Municipality of Ljubljana (under development)

10.5. Visions and goals

Every national transport policy has an important role in the country’s general policy, since it enables the operation and development of society as a whole. An optimum transport system is a fundamental condition for a country’s efficient operation, since it provides for the implementation of other country’s policies and is also regarded as a precondition for economic development. The transport policy vision is thus part of a common vision of a country and also a necessary condition for its operation. The transport policy vision is defined as the provision of sustainable mobility for the population and supply to the economy. The definition is derived from basic traffic and transport activity which entails moving or transferring people, goods and information in space and time. The word ‘provision’ means that a country will ensure the sustainable mobility of its population and sustainable supply to the economy by transport policy measures. The word ‘sustainable’ relates to the efficient operation of a transport system, which functions at the intersection of environmental, social and economic aspects. The measures at the

intersection of environmental and economic aspects are implementable, but not necessarily socially acceptable; measures at the intersection of social and economic aspects are just, but not necessarily environmentally acceptable; measures at the intersection of the environmental and social aspects are tolerable, but not necessarily economically acceptable. The vision of transport policy strives to implement measures which provide sustainable mobility for the population and sustainable supply to the economy. The schematic diagram in the following figure shows all three aspects with interactions.

Source: Transport development strategy in the republic of Slovenia, 2014

Short and long term transport goals

The general objectives of transport policy are determined on the basis of the vision. The objectives are as follows:

- Improvement of mobility and accessibility;
- Improvement of supply to businesses;
- Improvement of traffic safety and security;
- Reduction of energy consumption;
- Reduction of users' costs;
- Disburdening of the environment.

The last objective (the reduction of environmental burdens) is also crucially related to the objective of reducing the burden of diseases caused by inadequate transport which is pursued by the Ministry of Health. Therefore, the measures defined on the basis of this objective will also include health.

Objectives are harmonized with the objectives of the TEN-T ordinances on the technical specification for interoperability in terms of the 'infrastructural' subsystem of the Pan European railway system for conventional speeds (2011/275/EU).

11. Ústecký Region (Czech Republic)

11.1. Introduction to the region

The Czech Republic is Central European country which covers an area of 78,868 square kilometers. It is bordered by Germany to the west, Austria to the south, Slovakia to the east and Poland to the northeast. Its population is over 10.5 million inhabitants and the density of the population is 133.6 inhabitants per square kilometer. The state itself consists from three historical countries called Bohemia, Moravia and Czech Silesia. However, the administrative division of the state consists of 8 NUTS 2 units (Praha, Střední Čechy, Jihozápad, Severozápad, Severovýchod, Jihovýchod, Střední Morava and Moravskoslezko) and 14 NUTS 3 regions.

One of these units is Ústecký Region (or Ústecký kraj), which is situated in northwest part of the Czech Republic. It covers an area of 5,335 square kilometers which represents 6.8 % of Czech Republic's surface. The region shares borders with the Liberecký Region (east), the Central Bohemian Region (south), Plzeňský Region (shortly in the southwest), the Karlovarský Region (west) and Saxony (Germany, in the north).

Ústecký Region itself consists of 7 districts of LAU 1 level and 16 administrative districts of MEP which are shown in Picture 1. There are 354 municipalities in the region and 59 have the status of towns or cities. The regional capital is Ústí nad Labem (93,248 inhabitants) which is the 7th most populated city in the Czech Republic. Population of the region is 822,350 inhabitants which makes the density of population 154 inhabitants per square kilometer – higher than the average of the Czech Republic.

The region is internally very diverse. Northwest part of the region is known for lignite mining and its industrial production whereas the lowland area around towns Litoměřice and Louny is famous for hops, wine and vegetables production. The town Šluknov is located in protrusion of Czech borders and the area is typical periphery with related problems (resettlement after the expulsion of German population after 2nd World War, higher percentage of minorities, higher unemployment rate etc.). The natural sites of the region belong to the most beautiful parts of the Czech Republic – we can mention for example Pravčická brána located in the National Park Bohemian Switzerland or hill Říp which has significant historical meaning for the Czech nation.

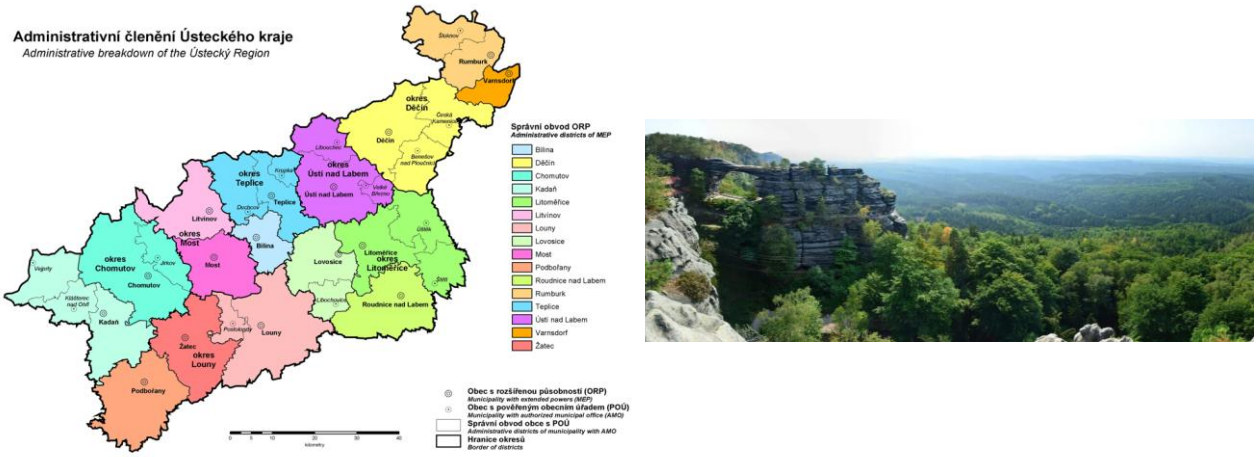


Figure 18 Administrative breakdown of the Ústecký Region (source: Czech Statistical Office); view at the landscape of Ústecký Region (source: Simona Sváčková)

The unemployment rates in Ústecký Region are the highest of all the regions in the Czech Republic. In the end of December 2015 the unemployment rate of the region was 8.91 % whereas it was 6.24 % in the whole state. Even though the rates are the highest they are declining over past few years and the situation is getting better.

Age distribution of the population of the region is visible on Picture 18. There are three major changes which are clearly visible. There are more people in age of 60 – 70 due to baby boom after 2nd World War and in age of 35 – 44 due to pro-natal politics during the socialist era. We can see also the decline after the velvet revolution in 1989 which is balanced by delayed fertility of cohorts mentioned earlier. When compared to the rest of the Czech Republic, the region's population is quite young. The average age is 41.2 years.

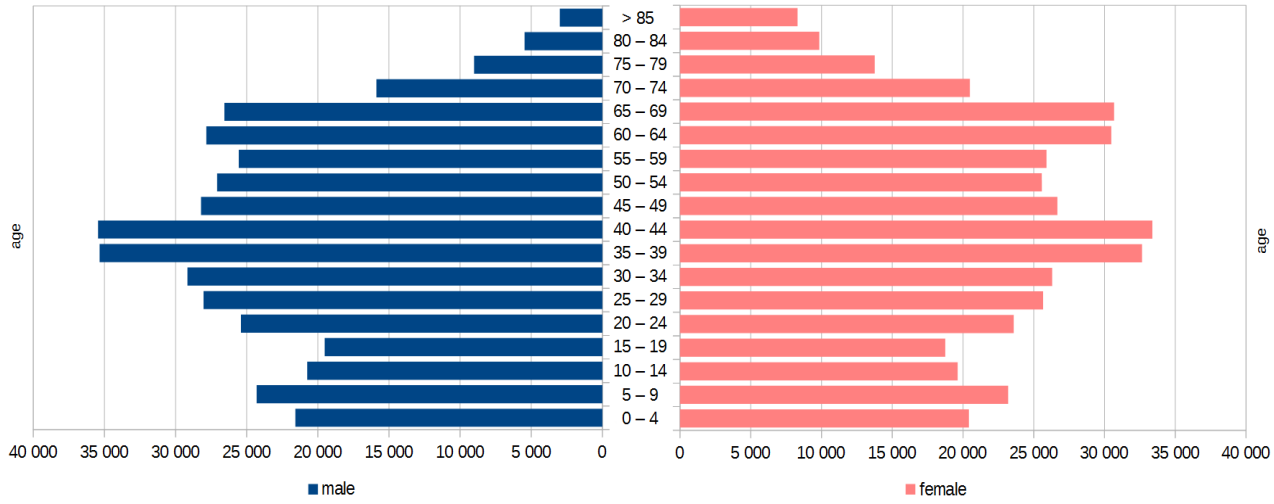


Figure 19 Age pyramid of Ústecký Region by 1. 7. 2015. (Data source: Czech Statistical Office)

11.2. Description of the transport system

The differences of districts modal shares (of modes used for commuting to work) are not significantly diverse when comparing municipalities of extended power (Picture 20). The use of automobile (as a driver) has the biggest share in all MEPs. The share of car users as passenger creates usually only a few percent. The higher proportion of railroad transportation is visible in MEPs Ústí nad Labem, Děčím and Litoměřice, which can be influenced by the quality infrastructure and relatively bigger amount of quick and high capacity connections.

Picture 21 shows the comparison of the shares of different modes of transportation used for work commuting between the year 2001 and 2011. The biggest relative increase belongs to individual automobile transportation, while the shares of urban public transportation and railroad transportation decreased. Positive trend is the rise of walking, cycling and public urban transportation.

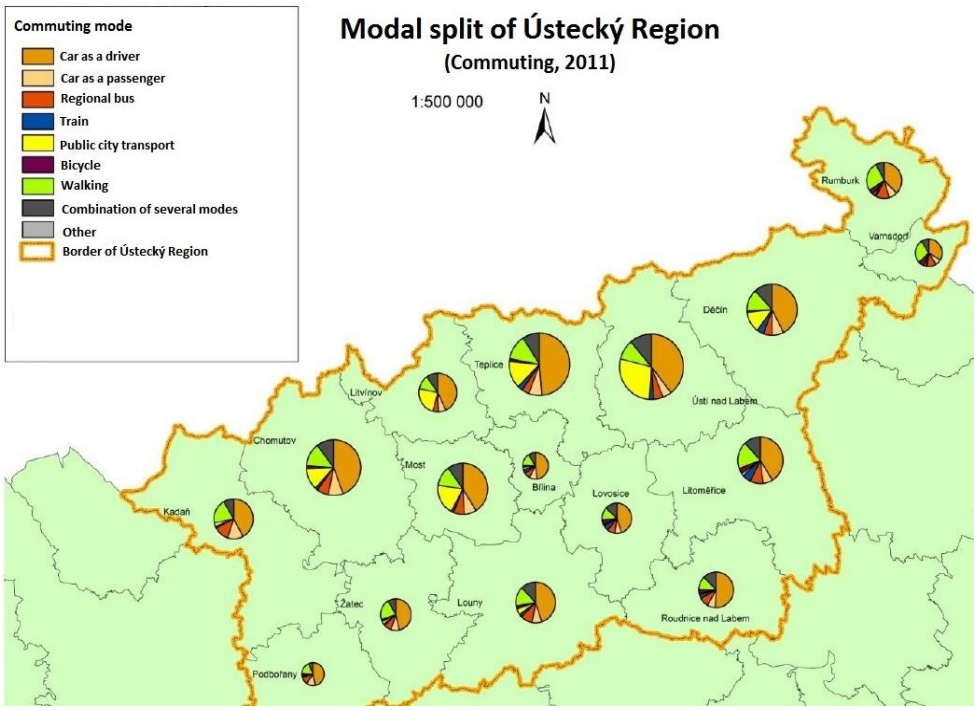


Figure 20 Modal split of Ústecký Region, 2011 (Source: Ústecký kraj 2016, p.39)

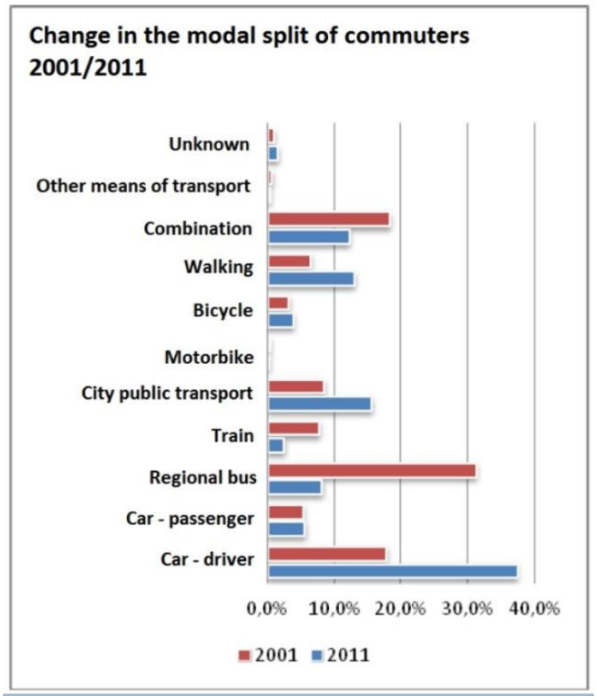


Figure 21 Change in the modal split 2001/2011 (Source: Ústecký kraj 2016, p.38)

The railway network is visible in the picture below. There are several backbone routes and other railroads which are making the network complete. The most important railroad connection of international significance is the railroad from Prague to Dresden (in Germany), which intersects the regional capital Ústí nad Labem (the orange in the picture). For the passenger transportation within the region is very important the railroad from Ústí nad Labem to Chomutov (that is blue in the picture). These intensities of the usage of the railroad network can be seen in Figure 22.

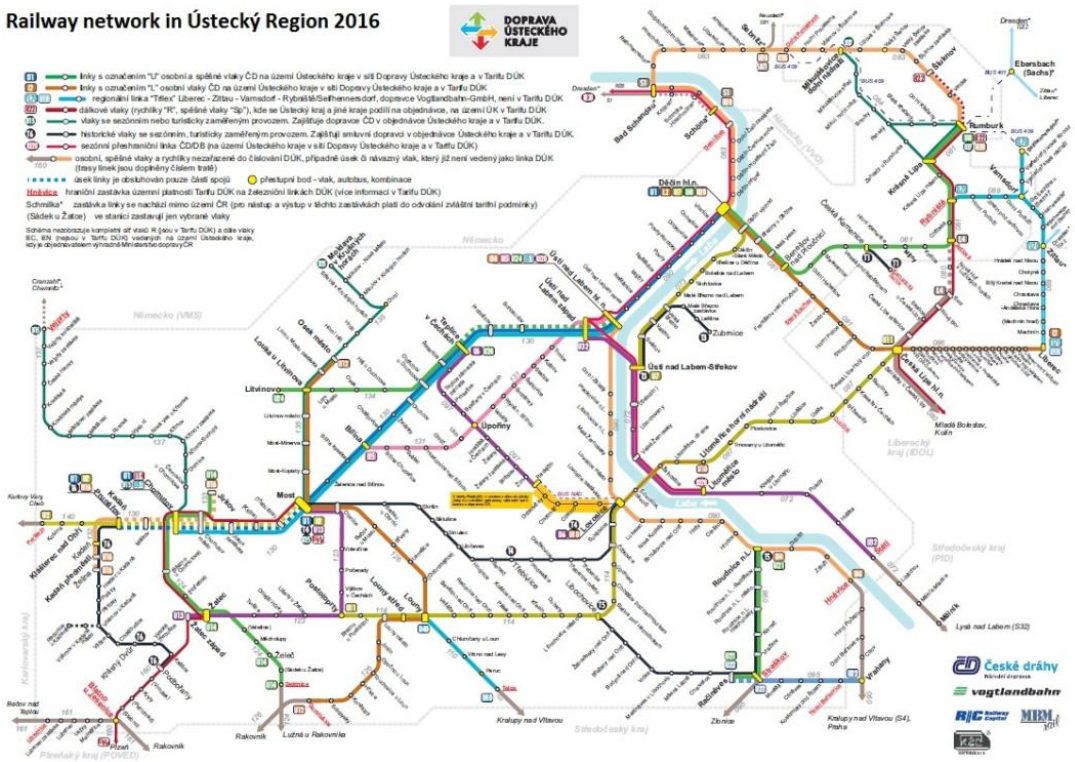


Figure 22 Railway network in Ústecký Region 2016. (Source: Doprava Ústeckého kraje)

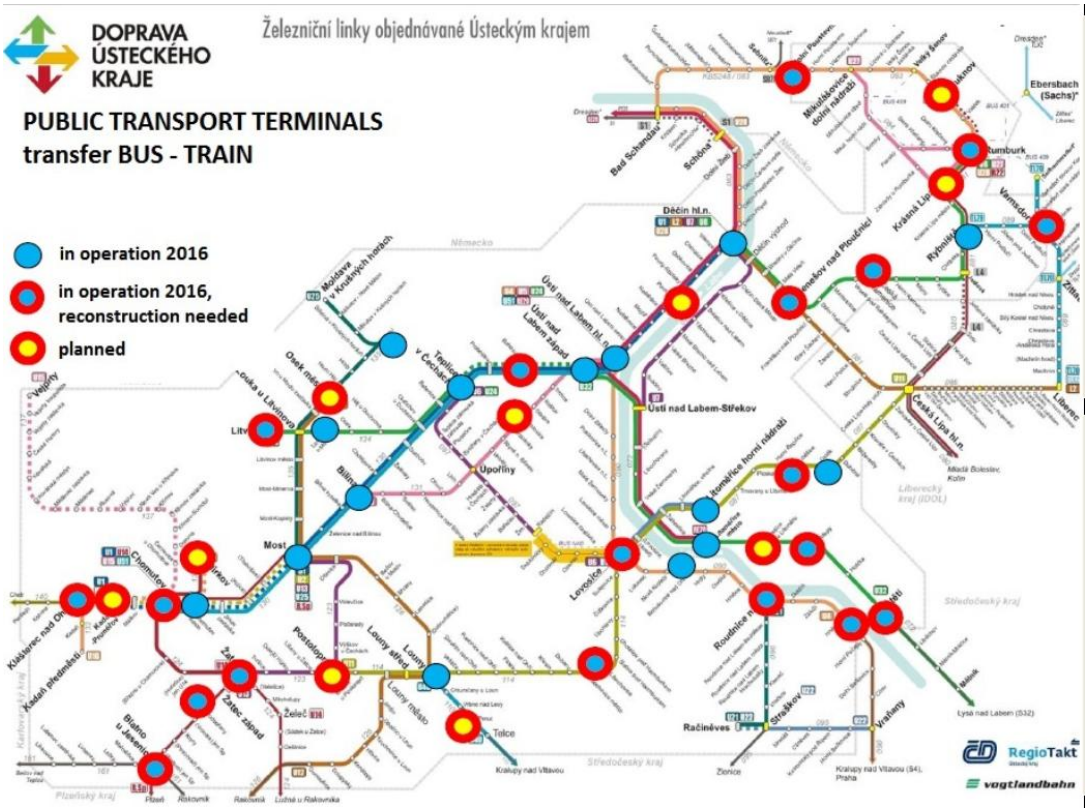


Figure 23 Public transport terminals. (Source: Ústecký kraj 2016, attachment 3)

Integrated transport network also uses the bus lines. The interconnection of the railroad system with the bus routes is very important since the railroad forms the core of the system and the buses routes create a

supplementary network with higher density. The intermodal transportation principles are used. In the In the above figure there are visible the public transportation terminals where the railroad transportation crosses the bus lines. The Transport of Ústecký region is quite new so there is still a space to grow and modernize. There are terminals in the picture which already exist (blue), which need a reconstruction (red and blue) and also planned ones. The already existing terminals are usually on the most used nodes and stations, because at these cities were the terminals most needed. The terminals which are about to be build are usually in less frequented stations, but they are still very important in order for the system to grow a develop.

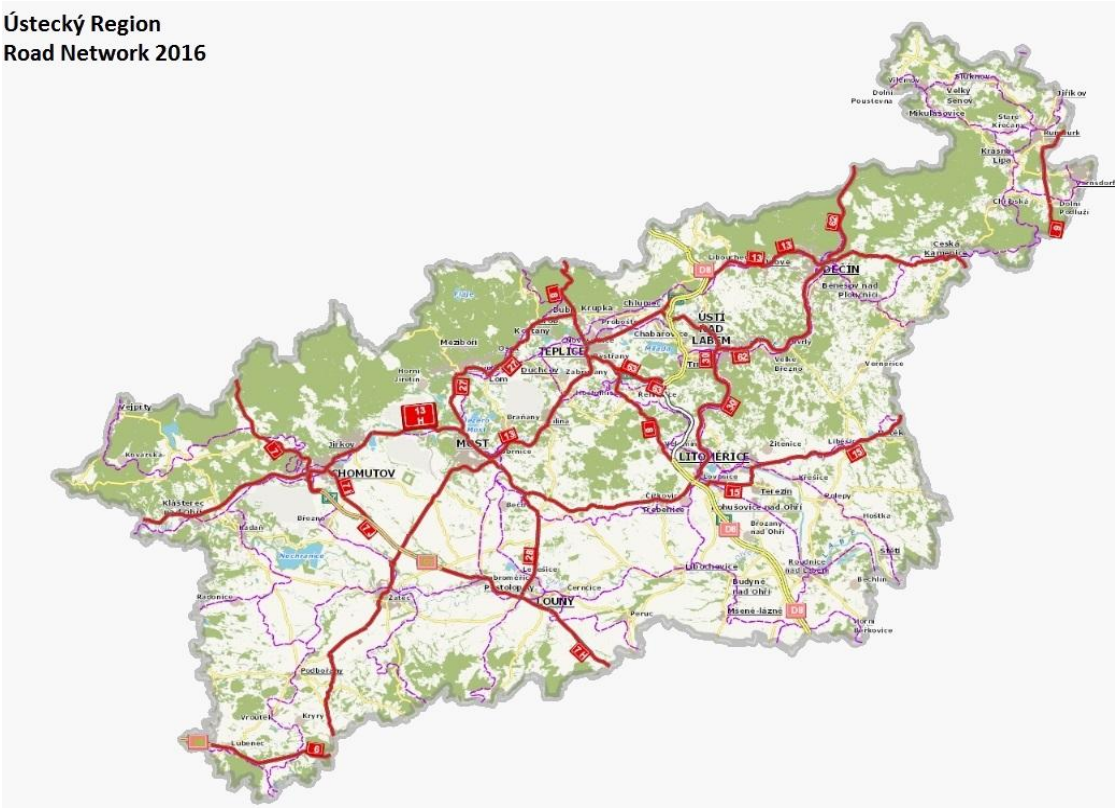


Figure 24 Road network of Ústecký Region (Source: Ředitelství silnic a dálnic)

There are two motorways intersecting the area of Ústecký Region. The motorway D8 connects Prague with Germany (Dresden). The length of motorway in the territory of the region is 56 km. According to the traffic census of 2010, there was a values measured more than 25 thousand vehicles per 24 hours using the motorway. One section of the motorway is still to be build. This section measures 16 km and it leads through the protected area of Central Bohemian Uplands which withholds the construction. Another motorway is D7, which is also incomplete. The existing section leads from Chomutov towards Prague and is 20 km long. There is also a network of first class roads (red in above figure), which are used densely as well. For example the first class road 13 from Chomutov to Děčín is used by 12,500 vehicles per day in average (of all sections).

Figure 25 Long-distance Cycling Routes (Source: Dálkové cyklotrasy ČR)

There are several long distance cycling routes in the territory of Ústecký Region. One of them is EuroVelo trail no. 7, which goes from Norway to Italy. There are also the routes 6, 15, 21, 23 and 25 and 35 which are mostly led in west-east direction. These long-distance trails are also a backbone for the cycling infrastructure. There are many other trails, which are shorter and they are very important for transportation and tourism as well. This infrastructure is visible in figure below, where are the routes divided by character of surface. It is visible that the infrastructure is only fragmental and it should be reinforced.

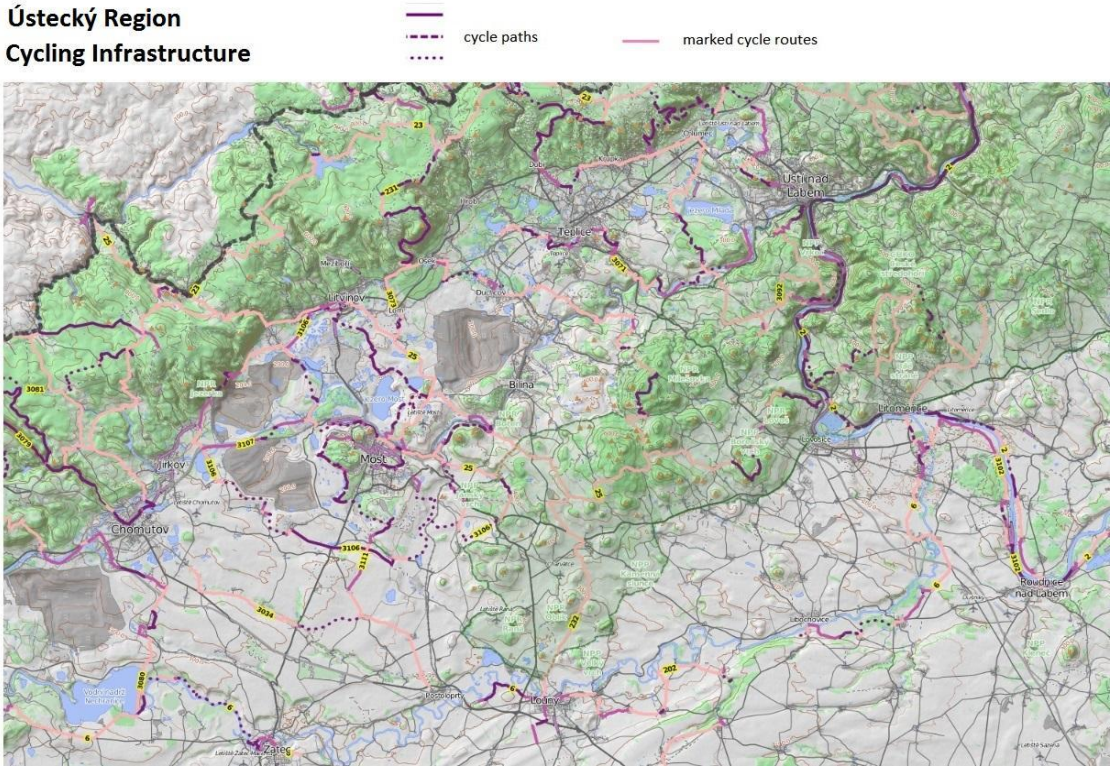


Figure 26 Cycling infrastructure (Source: Prahou na kole)

The infrastructure needs to be used only if there are people who travel. The commuting intensities can be followed in Picture above. These flows show the daily commuting to work, but only within the area. If we would consider the commuting behind the borders of the region, there would be also a flow towards the Prague, Germany and other regional capitals as well. We can see that the flow of passengers is dense in between of the regional and district capitals - Ústí nad Labem, Teplice, Chomutov, Most, Litoměřice, Louny and Děčín create an interconnected network. We can also see that the trips are usually taking place in the hinterland of these regional centers.

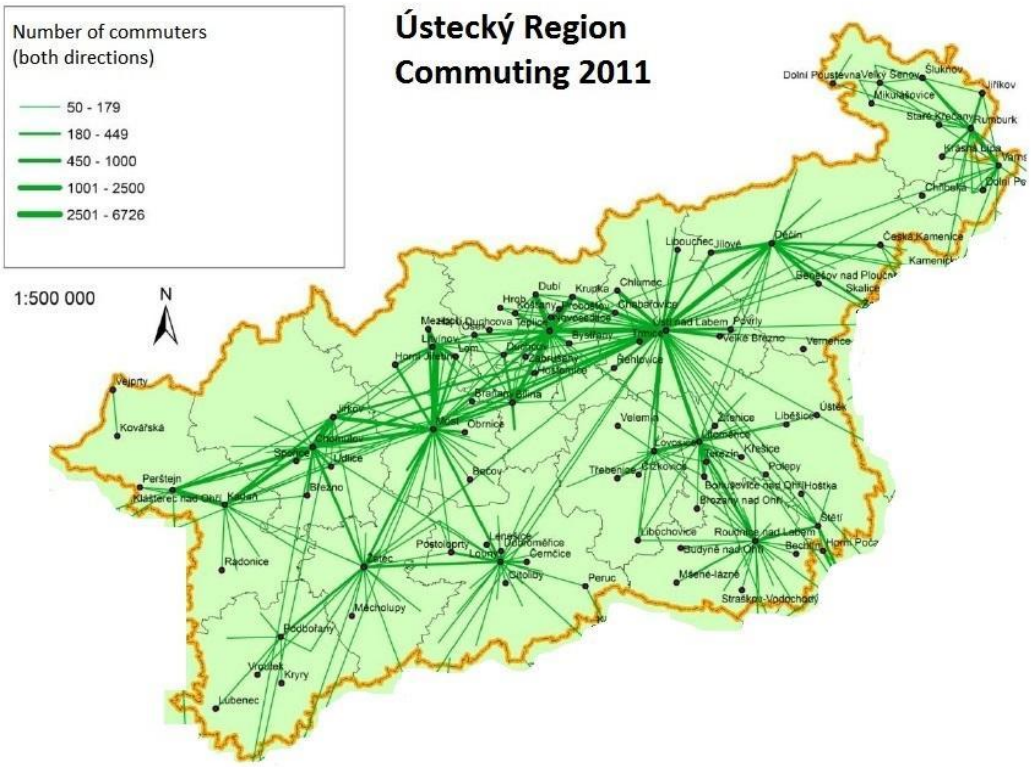


Figure 27 Number of commuters in Ústecký Region in 2011 (Source: Ústecký kraj 2016, p.40)

The integrated system of public transportation is quite new to the citizens of Ústecký Region. Because of the changes in organization of the public transportation there is a certain adjustment period, which could influence the data of the intensity of usage. In figure below we can see the development of number of railway and bus users in the region. We can see that the number of people using railroad is more or less stable. Due to the nature of this type of traffic mode the railway system hasn't experienced such changes as the bus lines system, which is slowly declining. This decline can be influenced by people using other modes of transportation (preferring cars, bikes etc.) as well as statistical methodology. Because the system fluently spreads the area of one tariff, there is a possibility of counting in less journeys. Before the system was introduced, passengers might need to change the buses during their travel and buy two tickets from different providers. Which means that in past they could statistically perform "more journeys" than now.

Number of passengers using public transport within Ústecký Region (thousands of persons)

	2010	2011	2012	2013	2014	2015
Railway	8 131,6	8 227,0	8 210,5	8 025,7	8 171,5	8 040,4
Bus	13 937,0	14 600,8	13 130,0	13 221,3	13 229,9	12 430,4

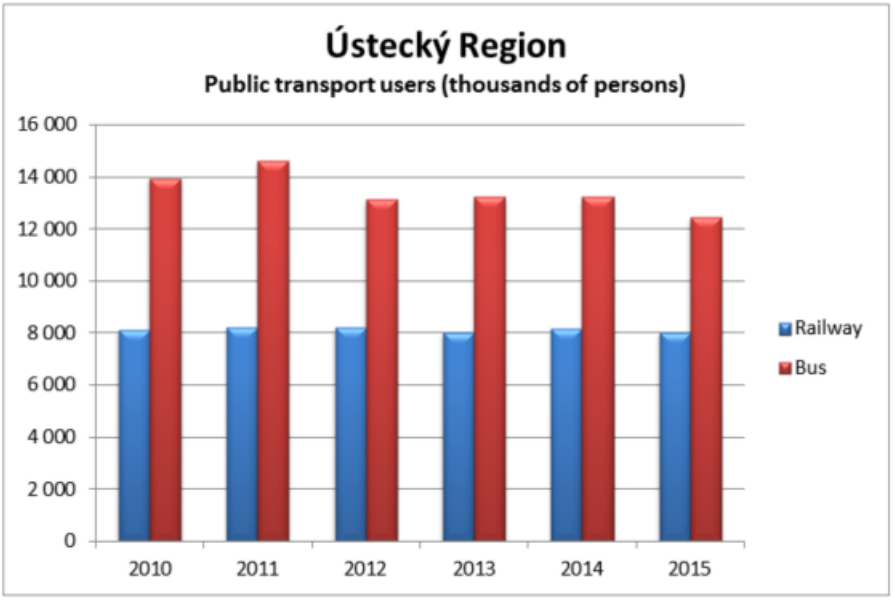


Figure 28 Number of public transport users (Source: SYDOS)

Transport services are managed by 6 bus transportation providers in Ústecký Region (Bus Line a.s., ČSAD Slaný a.s., ČSAD Česká Lípa a.s., Autobusy Karlovy Vary a.s., Arriva Teplice s.r.o., Regionalverkehr Dresden GmbH). There are also two railway providers - České dráhy a.s. and Vogtlandbahn).

The whole regional territory has been covered by integrated transportation system since 1. 1. 2005. It is presented to public by name Doprava Ústeckého kraje (DÚK) = Transport of Ústecký Region and it is continuously spreading over the region. The extensive net is created by system of regional train and bus lines with mutual coordination of routes of connections. The core positive aspects (and the main aims) of the system are single tariff, unified transport policies, optimization of the traffic and rising of the quality standards.

There are many towns and cities in Ústecký Region which are running public transport within their urban area. They do this by their own transport company or contracted private transport companies. The goal of Ústecký Region is to integrate all of the individual transport systems.

The integrated tariff is the tariff zone-relational. That makes the tariff zones the basic element of the system. The zones are defined by this principle: one municipality = one zone. The municipalities or towns which occupy bigger area are divided into more zones. There are 403 tariff zones in the region.

The price of the ticket is defined by the zone and their mutual distance. It was crucial to create a mutual settlement of finances between the transport companies to establish this system. The tickets can be divided by time validity as one ride tickets and prepaid passes. These passes have form of electronic cards which are made by the towns and the transport companies so the unified design is not necessary. Cards can be personified (concrete holder, photography and other personal data) or non-personified (anonymous, limited range of the tickets). The cards can be used as a ticket, electronic wallet or prepaid pass for the transportation.

The tickets can be also divided by the level of integration as integrated, partially integrated and nonintegrated. The types of travel fares are:

a) Regular fare - the price for transporting a passenger who cannot prove a claim to the use of reduced or special fares under the terms of the tariff

b) Reduced fare - the price for transporting a passenger who is entitled to a rebate. This discounted fare exists in the following variants:

c) Half fare - fare up to 50 % of regular fare

d) Pupils fare - fare up to 37.5 % of regular fare

e) Student fare - fare up to 75 % of regular fare

f) Fare for disabled - fare up to 25 % of regular fare

g) Employee fare - transport provider's employees and their dependents under the conditions specified in the tariff Duk

h) Free Transportation

The time frames of the tickets are as follows:

a) One ticket ride (time validity is influenced by number of system points)

b) One day ticket

c) Ticket for 7 days

d) Ticket for 30 days

e) Ticket for 90 days

f) Integrated one day ticket for Labe-Elbe network

g) Integrated one day ticket for Euro-Nisa network

h) Integrated ticket for luggage

i) Time framed coupons for urban public transport according to the tariff of towns (e.g. one year pass)

11.3. Governance structure and legal obligations

The Ministry of Transport is responsible for ordering the interregional or interstate train connections. The territory of Ústecký Region is used by these railways (visible also at Picture 14 :

- Ex3 Germany- Ústí nad Labem – Praha – Pardubice – Brno – Austria/Slovakia
- R5 Praha – Ústí nad Labem – Karlovy Vary – Cheb
- R15 Ústí nad Labem – Liberec
- R16 Plzeň – Žatec – Chomutov – Most
- R20 Praha – Roudnice nad Labem – Ústí nad Labem – Děčín
- R23 Kolín – Ústí nad Labem
- R25 Rakovník/Lužná u Rakovníka – Chomutov – Jirkov

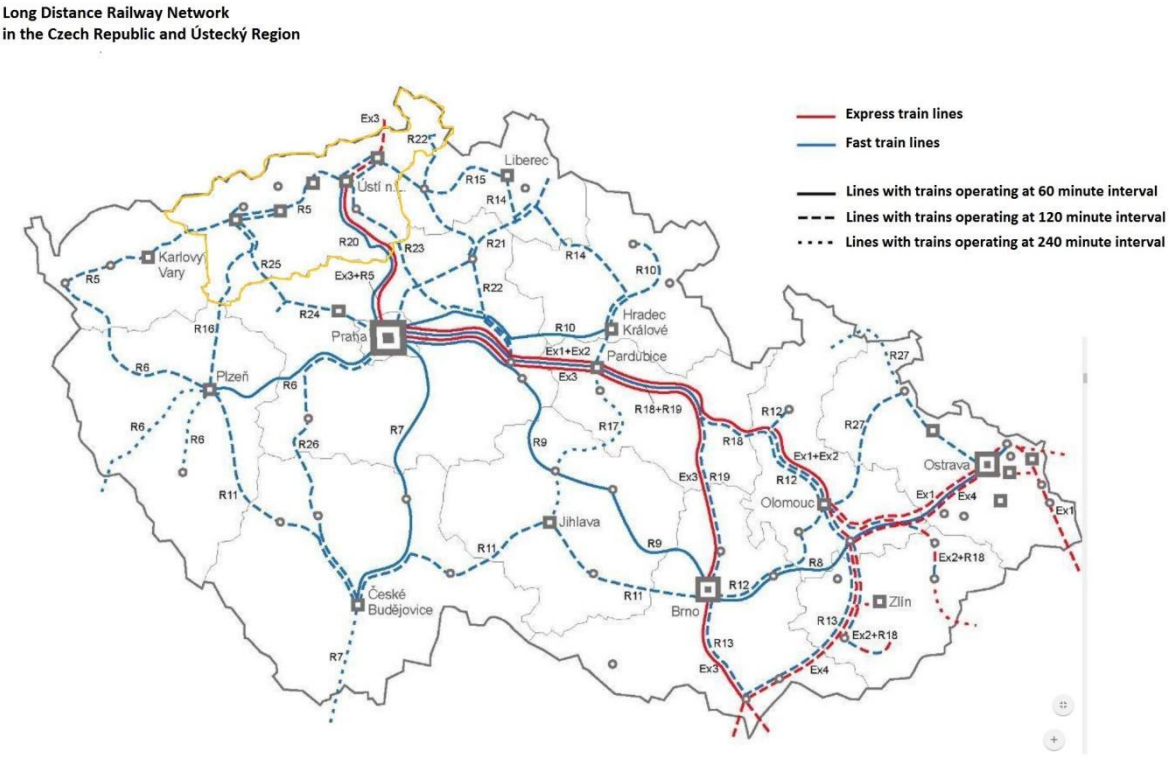


Figure 29 Long Distance Railway Network (Source: Ministerstvo dopravy)

Securing public transport services is provided by the Ústecký Region. Regional Office (Department of Transport and Road Management) is drafting the Plan of transport services in the Ústí Region for five years periods of time (2011-2016, 2017-2021). Then the Plan is approved by the regional assembly. Ustecký Region orders transport performances by individual transport providers in accordance with the Plan of transport services. Contracts with individual providers are usually concluded for 10 years. Currently, the region has signed two contracts with rail operators (valid until 2019 or 2020) and 15 basic long-term contracts for providing transport services by bus in different areas of the region.

Coordination of cycling (with emphasis on the development of cycling) provides Regional Development Department of the Regional Office.

11.4. Existing strategies

There are no cities or towns in Ústecký Region with Sustainable Urban Mobility Plan. Statutory City of Most has announced procurement for the elaboration of SUMP for Most and Litvínov cities. Based on the results of the tender the Accendo - Center for Science and Research, z.ú. has been entrusted with the processing of SUMP. Statutory City of Teplice and Municipality of Litoměřice are collecting materials and ideas for the future development of the SUMP launch.

Ústecký Region has elaborated these strategic documents:

- Plan of Transport services of Ústecký Region 2017-2021 (Plán dopravní obslužnosti Ústeckého kraje 2017-2021)
- Sustainable Development Strategy of the Ústecký Region (Strategie udržitelného rozvoje Ústeckého kraje)
- The Plan for Sustainable Transport of Ustí nad Labem (Generel udržitelné dopravy města Ústí nad Labem)

- Tourism Development Strategy of the Ústecký Region (Strategie rozvoje cestovního ruchu Ústeckého kraje)
- Marketing study of cycling in Ústecký Region (Marketingová studie cykloturistiky v Ústeckém kraji)

There haven't been created any workplace mobility plans according to the available information so far. However, these plans have been mentioned as one of measures in Sustainable Development Strategy of the Ústecký Region as a recommended solution for workplace mobility problems.

11.5. Visions and goals

The vision of the region is defined in the document Strategy of Sustainable Development of Ústecký Region from 2006. Ústecký Region wishes to be a broadly focused industrial region using modern and environmentally friendly technologies until 2020. The effective interconnection of research and development supported by quality educational background and direct application of innovative solutions in practice moves the Ústecký region towards the most progressive European regions. The emphasis is on raising number of economic subjects, environmental and social responsibility and use of partnership principles. This contributes to quality of environment of Ústecký Region, which is chosen by citizens as a place of work and living. The sustainable development goes hand in hand with competitiveness of region.

According to Strategy of Sustainable Development of Ústecký Region most people uses automobiles for the transportation, due to absence of other transportation modes in rural areas and due to personal comfort in the urban areas. Continuous reconstruction and modernization of the road and railroad infrastructure systems is due to this fact one of the primary goals of Ústecký Region, which is trying to elevate the transport on a level of time and quality. The functional infrastructure is accompanied by local development and competitiveness of local entrepreneurs and industries. Better accessibility also helps in a field of medical care and on daily life basis.

Another priority is limitation of the need of transportation at source and reducing transport demands arising as a result of forced mobility. The strategic goal coming from this priority is the reduction of the proportions of passengers using individual automobile transportation. The region is trying to accomplish this goal by creation of new jobs in a place of living; regulation of scattered residential and commercial buildings and support of compact villages, towns and cities, ensuring quality transport services in residential and commercial zones and other measures. Another priority supporting the limitation of car usage (especially on daily commuting trips of middle and long distance) is the establishment of an integrated transport system in cities of Ústecký Region, which would serve as a basic mobility system for residents, visitors or tourist. This system is based on railway and bus connections, accompanied by park and ride systems, cycling routes and support infrastructure for pedestrians as well.

The emphasis in the Strategy is also put on the environmentally friendly approaches in the industry and also in the transportation. Some parts of the region have been environmentally abused in the past, especially due to lignite mining and connected industry. Nowadays this means that the region is trying to revitalize the uncared-for places, diversify the land-use and fight with pollution as well. The region is among other things focused on reduction of greenhouse gas emissions. Eco-friendly principles are implemented by e.g. expansion of bicycle and combined paths, increase of the total area of pedestrian zones, increase of the share of public and private transport vehicles using alternative fuels.

To sum up, Ústecký Region is trying to implement environmentally wise approaches, deals with transportation and mobility of its citizens and visitors and incorporates this into its planning processes.

12. City and urban hinterland of Leipzig

12.1. Introduction to the region

The report focuses on the City of Leipzig including the surrounding districts. Leipzig is situated in western Saxony and the biggest City in Saxony. As trade fair city, for that economies is structured especially in the trade, services in the field of public, technical and financial, economical services.

Figure 30 Federal state of Saxony

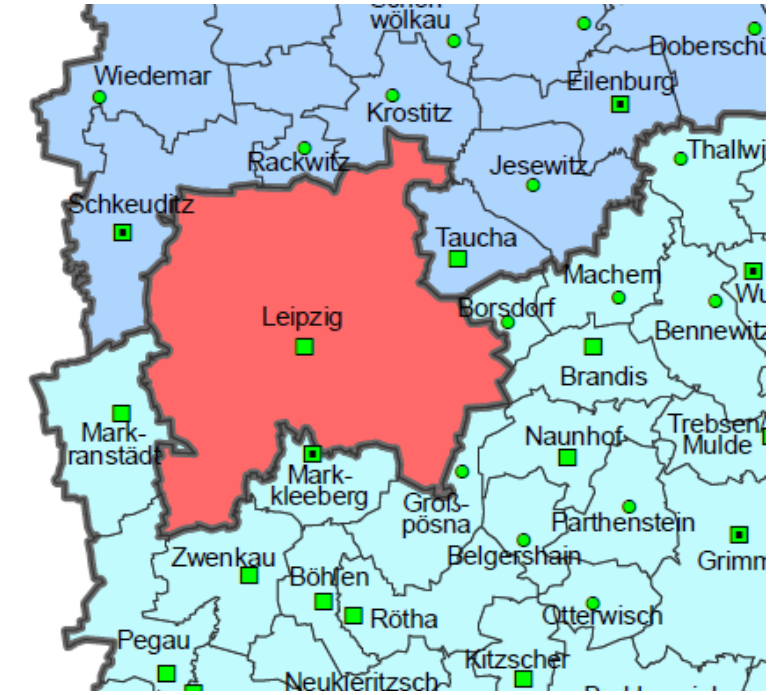


Figure 31 City of Leipzig with surrounding districts

The City of Leipzig is surrounded by 17 small Municipalities, plays an important role when it comes to commuter and connection of transport beyond the city administration borders and the transport connection with the hinterlands. The total area of the city region including the surrounded districts is 815 km² with a total population of 694.000 inhabitants (see Table 20). Due to the political change of Germany in 1990 Leipzig became a shrinking city. Through incorporation of Municipalities and positive migration the amount of inhabitants currently increases. Whereas the development of inhabitants in the surrounding districts remains relatively stable the City of Leipzig is the most increasing city in Germany through an increase of 18.000 inhabitants end of 2014 till begin of 2016. Today the City of Leipzig is about 575.000 inhabitants [2]. The spatial concentration of new inhabitants focuses on the inner-city.

Table 20 Area and inhabitants of the city of Leipzig and surrounding districts.

Municipality	Area in km²	Inhabitants 2011	Inhabitants 2014
City of Leipzig	297,39	502.979	544.479
Belgershain	22,78	3.328	3.321
Böhlen, City	24,53	6.702	6.627
Borsdorf	15,58	8.202	8.247
Brandis, City	34,81	9.408	9.386
Espenhain	28,16	2.402	2.328
Großpösna	41,42	5.308	5.328
Machern	38,90	6.628	6.655
Markkleeberg, City	31,35	23.672	24.110
Markranstädt, City	58,28	14.763	14.894
Naunhof, City	39,49	8.471	8.528
Zwenkau, City	46,22	8.775	8.882
Pegau, City	48,62	6.485	6.282
Jesewitz	52,29	3.038	3.011
Krostitz	43,08	3.749	3.764
Schkeuditz, City	81,16	16.922	17.150
Taucha, City	33,13	14.128	14.832
Trossin	79,60	1.357	1.304
Wiedemar	95,13	5.335	5.179

The age distribution in the City is Leipzig is visible in Figure 32. 15% of Inhabitants are under 18 years old. 64% are between 18 and 65 years old and 20% are above 65 years old. The biggest proportion is the group of people between 25 and 40 years.

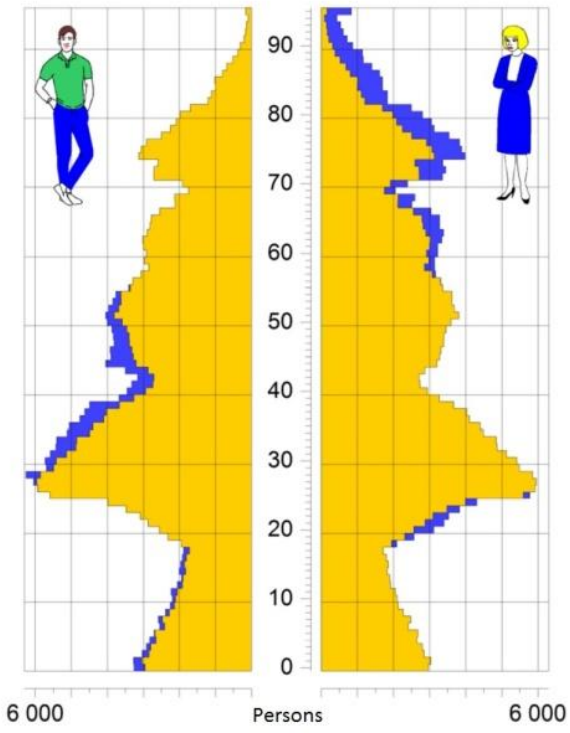


Figure 32 Age distribution of City of Leipzig 2015

Also the unemployment rate currently decreasing see Table 2 and stands at 7,9% currently [4]. The average unemployment in Saxony is 6,9% and 5,8% on national level [5].

Table 21: Unemployment rate of the City of Leipzig

Year	2011	2012	2013	2014	2015	2016
Unemployment rate City of Leipzig (in %)	11,8	10,8	10,3	9,4	8,8	7,9

12.2. Description of the transport system

Through the increasing growth of population Leipzig needs an efficient transport system providing commuting services in and out of Leipzig. In the year 2010 the amount of people crossing the city border for going to work was 136.900, which was around the same name number of employees working and living in Leipzig (136.000). Two thirds of commuting takes place with the near cities and districts (City of Halle (Saale), Landkreis Leipzig, Kreis Nordsachsen, Burgenlandkreis, Saalekreis, Kreis Altenburger Land, Kreis Anhalt-Bitterfeld) [6]. The number of commuters is currently increasing. In 2015 around 149.000 employees commuted in and out of Leipzig to work. Around the half of employees the City of Leipzig commuted from the surrounding districts Landkreis Nordsachsen and Landkreis Leipzig [3]. These numbers show that commuting is an important factor and target group for transport policies and actions as e.g. Park and Ride, Bike and Ride Job-Tickets [6].

The transport system in Leipzig is well developed and combines different transport modes in sense of modal split (see figure below).

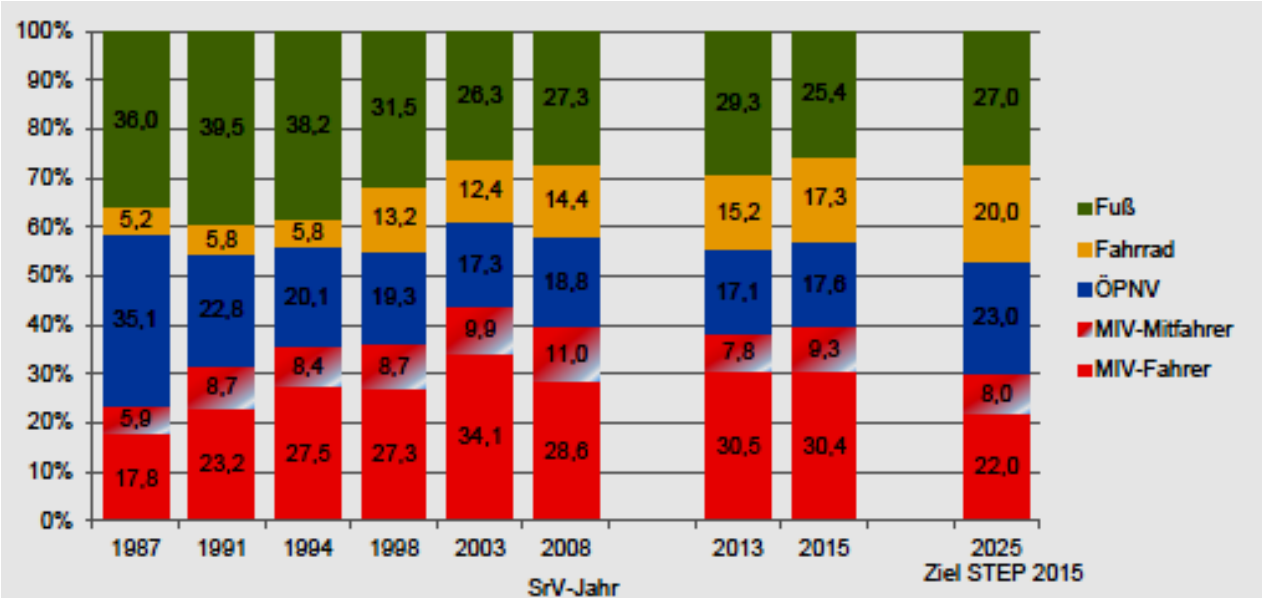


Figure 33 Modal Split in City of Leipzig

(Legend: green: walking; yellow: cycling; blue: public transport; red-white MIT-passengers; red: MIT driver)

Figure 33 shows the most proportion has motorized individual transport (MIT) with almost 40% and walking with 25%. It is recognizable that the cycling increases so that the aim for 2020 to reach 20% cycling use of modal share should be reachable. Action needs are important concerning the reduction of MIT and increasing public transport use [2].

In comparison to other cities in Germany Leipzig is on average with public transport and MIT (see Figure 34). In public transport sector there are reserves in comparison to other Cities in East Germany (Dresden Halle, Potsdam). With 17.3% as modal share of cycling ranks Leipzig to the 2nd place in the city comparison of Germany [2].

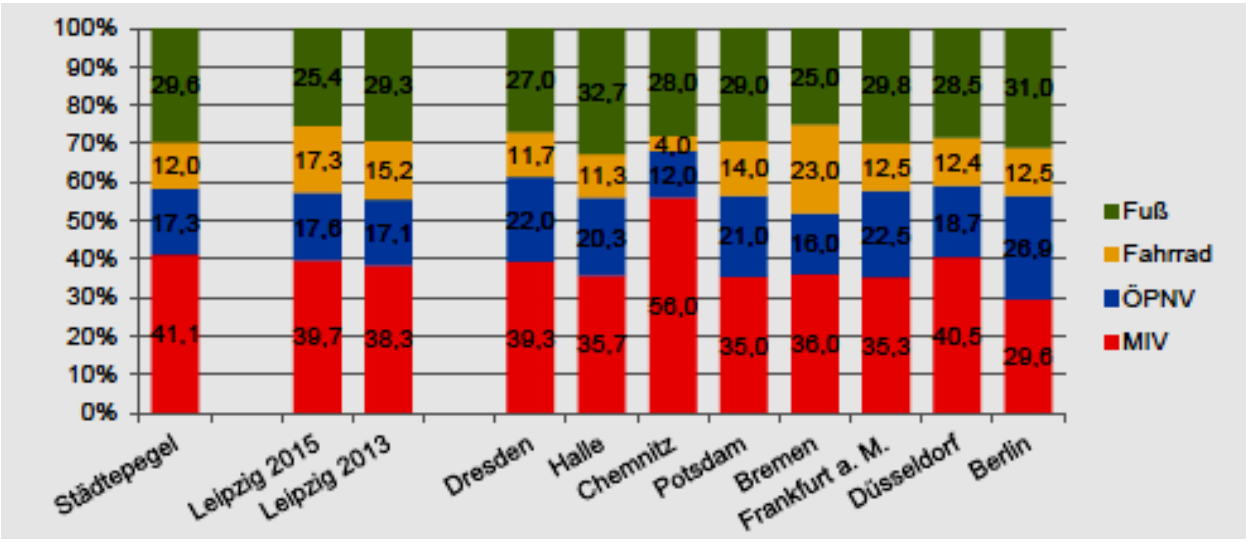


Figure 34 Comparison of Modal Split, cities in Germany

(Legend: green: walking; yellow: cycling; blue: public transport; red: MIT driver)

The road network of Leipzig is around 1.750 km without the highway (Autobahn). The major part of traffic of motor vehicles concentrates on the 400 km network of main streets. The advantageous element of the traffic system is the highway, which is a ring surrounding city ("Autobahnring"). This leads to a good road network with less traffic jam and is an important factor for the city and the transport connection to the surrounding districts and other cities.

The public transport system in Leipzig consists of tramways with a length of 215 km and a bus system with 737 km lengths. In 2015 about 111,3 million user have been count for tram and 26,9 milion user of buses [4]. Nearly all trams and buses have a frequency of 10 till 15 min. The regional transport Leipzig is based on a regional train system out of 'S-Bahn' and 'Regionalbahn'. Since the realization of the 'City tunnel' in the end of 2013, the connections within the inner city as also the connections between city centre and other cities in the regions are improved. Especially important for the City of Leipzig is the connection of public transport with individual modes of transport .For that the planning of 'Park and Ride', Bike and Ride' have an important role especially for not well connected areas. Operators for the public transport System are the 'Leipziger Verkehrsbetriebe (LVB)'. The Zweckverband für den Nahverkehrsraum Leipzig (ZVNL) is operator for train and S-Bahn. The Mitteldeutsche Verkehrsverbund (MDV) has the responsibility in the City of Leipzig and Halle and five districts for the fare system, coordination of transport offers, timetable, financial issues and marketing. There are also other private or public transport operators on specific transport lines [6].

The fare and ticketing system is divided in zones including parts of the surrounding bigger districts 'Landkreise Leipzig, Landkreis Nordsachsen, Landkreis Mittelsachsen' jointly coordinated by MDV. The price depends on the crossed zones. This is a common ticketing which includes all regional transport offers (Bus, Tram, Regionalbahn, S-Bahn and so on). Beside normal printed tickets available on automates and service points there exist also electronic booking systems e.g. with 'easy Go' app for smartphones.

Cycling becomes more and more important also seen in modal split (Figure 33). Especially in summer months, proportion on modal split is around 18% and in the inner-city 22%. The length of cycling routes in the whole City of Leipzig is over 400 km. Since 2003 about 100 km new routes have been realized especially on main traffic routes. In the city center parking infrastructure for bicycles has been installed. There are around 1.200 bicycle holders and 1.700 places in bicycle-garages from the University. Also more than 50 'Bike and Ride' stations have been installed with over 1.500 bicycle holders in the city. Further installations are planned [6].

Due to the compact settlement structure of the City of Leipzig and a car reduced road network, walking and cycling have a good starting position. Moreover, the public transport system is also good structured.

12.3. Governance structure and legal obligations

The responsibility for public transport is on the federal states Saxony for regional transport by train and bus, which name the responsible offices and authorities like the 'Verkehrsverbünde'. For the public transport in the city area the Municipalities are responsible. So in case of City of Leipzig the city administration is responsible for Tram and Bus. They have to create a public local transport plan regularly. The last one was established in 2007 and regulates standards for services, conception of integration transport networks as well as financing the transport services. Right now the City Municipality is updating this strategical plan for public transportation. The City of Leipzig has contracted the Leipziger Verkehrsbetriebe GmBH (public owned transport company of the City) for that work [6].

The responsibility of road networks depends on the categorization of roads:

- National policy: Highway (Autobahn) and national streets (Bundesstraßen)
- Federal policy of Länder: federal state routes
- Municipalities: Municipality streets (Kreis and Gemeindestraßen), public traffic areas.

12.4. Existing strategies

In the City of Leipzig several strategies exist, dealing with transport and mobility actions. This can be separated in strategies for the whole city area, strategies for different transport modes or specific thematic issues or specific city districts related to mobility and transport.

The basic strategy for the city development is the integrated city development concept (Leipzig 2020 Integriertes Stadtentwicklungskonzept: SEKo). SEKo is a city development strategy including all resorts and thematic issues in the city. These are housing, economy and employment, public space and environment, education, social, culture, centers, preservation of historical monuments, sport as well as transport and technical infrastructure.

For transport issues especially two general principles of the city are ‘city of short distances’ (Stadt der kurzen Wege) and ‘firstly core city before suburbs’ (Innen- vor Außenentwicklung).

SEKo was created in 2009 together with all city offices. At the moment the city development concept 2030 is under preparation and should be finalized in 2017 [8].

The actual traffic development plan of the City of Leipzig was created in 2015 (Stadtentwicklungsplan Verkehr und öffentlicher Raum) and it is dealing with transport and mobility in Leipzig. It includes a description of current situation, principles and concepts. The topics are:

1. Overall topics, which defining integrated mobility and transport issues:

- mobility for all,
- environmental friendly transport,
- commercial transport,
- roads and places as living room,
- integration of regional transport.

2. Principles of and conception for the different transport modes:

- walking,
- cycling,
- public transport,
- motorized individual transport.

3. Action fields for city mobility:

- transport efficiency settlement structure,
- traffic safety,
- transport management,
- multimodal mobility [6].

Especially in point 3. important aspects are related to mobility management. Regarding the two general principles of SEKo ‘city of short distances’ (Stadt der kurzen Wege) and ‘firstly core city before suburbs’ (Innen- vor Außenentwicklung) avoiding traffic is one of the main goals. For the different city areas (core city, inner-city, exterior areas) objectives are developed. Concerning public transport the reachability of stations are important. Also transport management with transport information system, management of traffic lights and parking system are part of the strategy. The aspect of multimodal mobility is mentioned directly related to mobility management. Objective is here to influence mobility behavior [6].

For mobility management a first concept has been developed in 2010 through a national action program mobility management called 'Effizient mobil' financed by Ministry for the Environment, Nature Conservation and Nuclear Safety. The concept provides actions for connection and automatisation of mobility information, creating a mobility manager in the city administration, for bundling mobility actions from different offices of city administration, mobility consulting for citizens, tourists and companies [9].

Beside the general plans for the whole cities their exist lot of subplans for the different transport modes, for examples cycling development plan, local public transport plans, parking situation in districts, for sport events, 'car reduced city centre'. The information for current concepts are available on the homepage of City of Leipzig [10].

12.5. Visions and goals

The general goals and objectives are mentioned in the integrated city development concept (Leipzig 2020 - Integrierte Stadtentwicklungskonzept – SEKo) in following fields:

- **increase national and international importance** through increasing their strength, better communication of qualities, fostering city cooperation;
- **increase competiveness of the city** through development of soft place based strength, profiling of economic structure, qualify and ensure skilled employees, provide infrastructure and areas for industry trade;
- **ensure and improve quality of live** through ensure and need oriented adapting of infrastructure offer, sustainable housing market and district development, ensure and expand leisure and culture offers, foster climate protection and environmental quality;
- **ensure social stability** through reducing disadvantages, support integration and further development of leisure offers for child and youth [7].

In the transport sector the general objectives are:

- integration of regional transport and fast, save and effective interlinkages in the economical regional area and the city;
- ensure equivalent mobility offers for all citizens;
- fostering city and environmental friendly organization of transport through increasing public transport and cycling as well as reduction of car traffic in the inner city districts;
- designing of public spaces for qualification of city and stabilization of residential districts [7].

For 2025 it is envisaged to have 70% of all daily trips through environmentally friendly transport modes (public transport 23%, walking 27%, cycling 20%) [2], [6], [11].

The priority actions to reach this aim are: improvement of public spaces, increase of accessibility of public transport, afforded public transport on traffic lights, improvement of cycling routes, fostering of walking, improvement of traffic light management, reduce traffic in the inner city through realizing the concept' car reduced city centre' and also relies new instrument of financing. [11]

More details are included in the sections of the city development plan transport and public space under the respective principles of the chapters.

Under the section of multi modal mobility which includes mobility management the following principles are listed:

- interlinkage of all mobility offers to envisage environmentally friendly alternatives for car and facilitate the choice of transport modes;

- setup mobility stations, ‘Bike and Ride’, ‘Park and Ride’ for facilitate change of transport mode
- further development of information system and fare system for support of inter- and multimodal transport;
- fostering of car sharing in areas with bad parking situation and realize places for car sharing and e-vehicles;
- development of strategies for influence mobility behavior, and impulses for mobility management in companies;
- mobility marketing especially for new citizens;
- supporting of mobility management through public relation through offers of alternative mobility forms and participation of EU-week of mobility [6].

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