



PÉCSI TUDOMÁNYEGYETEM
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Sharing Economy in metropolitan centre of Brno, Czech Republic.

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I. Introduction

The concept of sharing economy is that of an economy based on sharing in the community. Botsman and Rogers (2011) first introduced this concept in their book “What's Mine Is Yours: The Rise of Collaborative Consumption” in which they also offered the following definition of the sharing economy: “An economic system based on sharing underused assets or services, for free or for a fee, directly from individuals” ^[1]. Elements of the concept include environmental awareness, rationalising consumption habits and curbing consumption. The sharing economy aims to rein in the global overconsumption that is based on individual consumption and to reduce the need for new resources. Since the spread of the internet, new dimensions of business activities have emerged which are adapting to globalisation along with an accelerated pace of life. In this globalising economy market, players must respond to consumer needs in a highly innovative environment. Based on this, we can say that in the 21st century, a time when the focus will be on sustainable development, sharing economy can be a megatrend^[2].

In this work, we will discuss how Sharing Economy is used in Hungary and in France. Because of the vast subject that is sharing economy, we have decided to focus on only one aspect of sharing economy: sharing mobility. Hence, we will introduce the use of sharing mobility in Hungary before talking about shared mobility options in Pecs, Hungary. We will then do the same for France and focus on the shared mobility options in Paris before introducing the actual approach of the metropolitan centre of the city of Brno in Czech Republic towards shared mobility. Finally, before concluding, we will use our knowledge of shared mobility in Pecs and in Paris to formulate some proposals for the metropolitan centre of the city of Brno to hopefully adapt so that they develop their sharing economy.

I. Sharing Economy in Hungary

The Hungarian sharing economy has been developing rapidly in the past few years, based on the increasing numbers of emerging diversified initiatives and platforms. It can be determined from a study by PricewaterhouseCoopers Hungary, that the sharing economy has seven sectors in Hungary, where there are sharing-based services. These are the mobility industry; the retail and consumer goods; the tourism and hotels; entertainment, multimedia and telecommunications; the financial sector; the energy and human resources sectors^[3]. There are international participants in the Hungarian sharing economy, such as Airbnb and Wolt and there

are also Hungarian home-grown businesses in it, such as Jófogás (an advertising website, where people can sell anything), Miutcánk (a neighbourhood sharing platform) or the Oszkár (which can be translated to Motar in English) which is a carpooling system. Despite the constant increase in participants in the sharing economy in Hungary, there is only one special interest group in the country: The Hungarian Sharing Economy Association.

The Hungarian sharing economy is still relatively feeble in involving the public sector. According to a nonrepresentative survey by the Hungarian Sharing Economy Association, the main customers or end-users of the sharing economy are highly educated urbanites. Their main motivations are easier access to services and goods and lower prices, while sustainability is not that determinative. This survey allowed to point out that the other segments of the society are under-informed about the sharing economy services and there are 81% of the Hungarian inhabitants, who did not even hear about these services^[4].

According to a survey by Buda et al. (2019) which was conducted on a nationwide representative sample of 3,520 people in Hungary, approximately 38,4% of the Hungarian people are open-minded to the sharing economy services, while 61,6% are not open to these services. Due to this research, the sharing services are more popular among educated, metropolitan, wealthy, younger and family-oriented people. The proportion of the respondents who are fenceless toward different sharing economy services is 23.2% for public bike-sharing; 20.1% for private flat-sharing (e.g., Airbnb); 12.3% for borrowing or lending to household appliances; 15.8% for public car-sharing (e.g., DriveNow, Mol Limo); 23.7% for public car ride-sharing (e.g., BlaBlaCar, Motar) and 21.5% for private car-sharing within the city (e.g., Uber) ^[5]. It means that among Hungarian inhabitants, car-sharing was the most popular way of sharing economy in 2019, bike-sharing was the second, private-car sharing the third, private flat-sharing the fourth, public car-sharing the fifth and the least popular was borrowing or lending household appliances from the answered services.

According to the Eurobarometer's cross-country, representative survey despite there being 38,4% of the inhabitants, who are open-minded to sharing economy services, only 16% of the Hungarian population took part in any sharing activity in 2016. This ratio is lower than in other European countries, such as Croatia (24%) and Romania (20%), but higher than the participation rate of the other Visegrád countries, like Czechia with a 7 per cent proportion^[6]. Based on these data, it can be stated that Hungary still has room for improvement in the field of sharing economy, but progress can already be seen.

I. Sharing mobility in Hungary

As in many countries around the world, sharing mobility is becoming more important also in Hungary. There are many ways of transport besides the public transport and private car use which make it easier to cover distances in the everyday life. These alternatives can be fast, affordable and the best possibility, if they are environmentally friendly as well. I would like to introduce the alternatives to these vehicles in Hungary in the following few pages through the examples from three Hungarian cities, Budapest, the capital city of Hungary, Pécs and Székesfehérvár which are fast-growing cities like Brno.

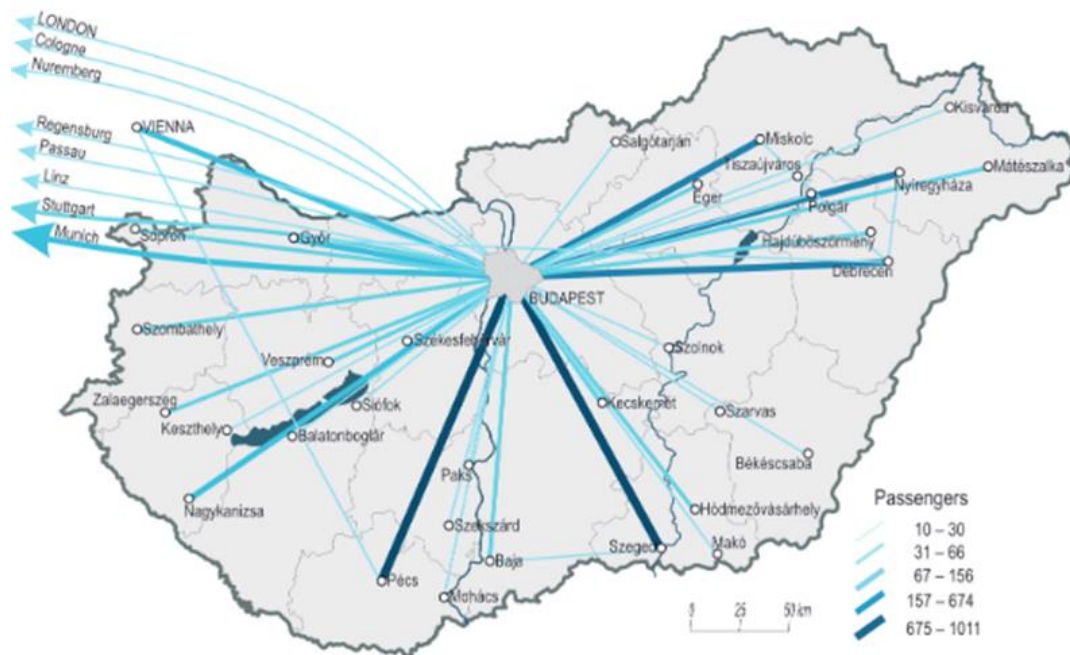
a. carpooling

One of the best-known ways of shared mobility is carpooling. When someone in Hungary says carpooling, everyone associates with Motar (MOre Than A Ride, in Hungarian it is called Oszkár) which is a Hungarian ridesharing system which was inspired by foreign examples like Blablacar, Karzoo, Lyft, Commutewise and Rideshare that are non-native carpooling options. In the Motar ridesharing system, drivers offer vacant seats in their vehicles on their routes, as a way of reducing costs and many times to have a pleasant trip with good company. Meanwhile, passengers can find a cheaper, more flexible and faster way of travelling instead of the slower and crowded public transport. Motar is the system that helps drivers and passengers to find each other for the benefit of all of them^[7].

Motar just like as many ridesharing systems has a lot of advantages. It is a cheap, comfortable way of travelling that is discreet with the users' personal data. The latter is important because passengers have the chance on the Motar website to check the driver's introductory profile where there are photos of the driver's car, links to social networking sites, ratings of the previous passengers and some other data from the chauffeur and their vehicle. There are other good properties of the Motar such as the ride offerer can manage that only acquaintances can book a place in their car if they feel it more safety.

Motar started its operation at the end of November 2007 and since then it has got more than 900 thousand users of its application^[8]. Based on a case study, 40 per cent of the people use it regularly and 60 per cent of people chose Motar occasionally in connection with some particular event. It is not an initiative of Pécs, Budapest or Székesfehérvár, it is used all over the country

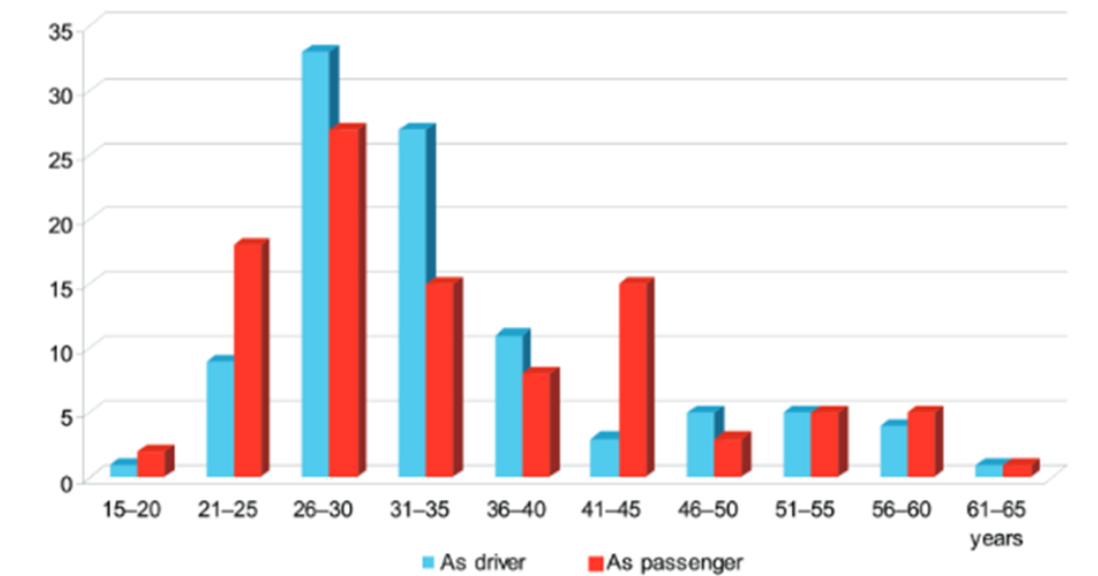
and also in Europe, the latter is mainly due to the Hungarians who are working in Western Europe as guest labourers^[9].



1st picture: Top 50 most popular ridesharing routes in a winter week (8-14 December) based on Motar data

Source: Bálint D., Trócsányi A., 2016. New ways of mobility: the birth of ridesharing. A case study from Hungary. Hungarian Geographical Bulletin 65. (4) 391-405.

The mentioned study also reveals that this type of ridesharing is most popular among people between 26 and 30 both as drivers and as passengers. In addition, Motar is the second most popular among drivers in their early 30's and passengers between 21 and 25. This may be due to most of the youngsters have a fifty per cent student travel discount on public transport in Hungary while they are studying so in this period of their life, they use buses, trams, metros and trains more. In addition, when they finish their education people search for a cheaper and faster option of travelling than public transport which helps them to reduce their spending as well. That data shows that this type of shared mobility can be most successfully targeted by those who are in their 20s or 30s because they are comfortable with the carpooling applications and they may not have a car yet^[10].



2nd picture: Age distribution of passengers and drivers in per cent based on Oszkár data

Source: Bálint D., Trócsányi A., 2016. New ways of mobility: the birth of ridesharing. A case study from Hungary. Hungarian Geographical Bulletin 65. (4) 391-405.

More and more people are interested in environmental protection in Hungary as well. The Motar developers recognised it and they placed a counter on the ride-sharing system's website which shows how many users of the application are on their way, how much money have the users saved and the quantity (in kgs) of the CO₂ emission avoided^[11]. These counters are motivating people to use shared transport options because they can see the positive impacts of the system. The Magyar Államvasutak (Hungarian State Railways) also use this type of motivation, since it indicates on the train tickets how much less the passenger's emission is if they are travelling by train and not by car.

Motar in numbers



3rd picture: The counter of Motar

source: <https://www.motar.eu/> time of download: 2022.06.17.

Another carpooling option that can be connected to Pécs is the 'PTE-Útitárs kereső', a Facebook group which helps the students of the University of Pécs share their voyage with other students. This site is the partner of BlaBlaCar and it has got more than 11 thousand users.

It is not as organized as Motar, but it may feel safer for some university students. It is so simple, drivers write a post about their route and the date of their travel and anyone who wants to join in the car can write a comment to clarify the details. Each student can check each other's Facebook profiles which are more personal than the profiles on the carpooling website. This manner allows everyone to choose a driver whom they have common acquaintances with. After they find the driver in the group they can ask their acquaintances how is the chauffeur driving and what do they think of their driving skills? These opinions can help find a driver who is a good company and drives safely as well^[12].

b. carsharing

Carsharing is also one of the ways how people can travel by car in an eco-friendly and cheap way. In Pécs, it is not a common thing unless family members or neighbours share a car, but in Budapest, it is a popular way of travelling. The three most known car-sharing companies are MOL Limo, GreenGo and DriveNow in the capital city. Carsharing provides the same privileges to users as they are having their car without the costs of the ownership. It is a fast, sustainable and flexible form of the car rental and if the car is an electric one it ensures the users do not pollute their neighbourhood with noise or toxic exhaust. Both of these systems can be used by smartphone applications with a minute-based tariff. GreenGo only offers electric cars for rent as a greener future is important for the company. Their goals are to increase the number of environment-friendly cars and to call for the increase in the development of charging stations in Budapest^[13]. Mol Limo and DriveNow offer electric and gas-powered vehicles as well for those who want to choose between these two types of cars. Both systems are cheaper than owning a car if the user does not want to use it every day^[14].

Uber was also a carsharing option in Hungary until 2016 when it was banned for the benefit of licensed taxi services. The inspections revealed that Uber drivers did not comply with Hungarian tax laws when Uber drivers did not have a tax number, give receipts to passengers or even have a special, passenger-transport driving licence. This service was only available in Budapest but it had got more than 200 thousand users of it when it was banned. Since then many of the users miss it because it was cheaper than a cab and it did not burden the traffic with other private car user since it was a carsharing system^[15].

c. motorcycle sharing

The next sharing system that I would like to introduce is a motorcycle sharing system which is called Blinkee and which launched in Poland in 2017. The service became popular quickly so it was extended to more European countries until 2022, including Croatia, Czechia (Prague), Hungary, Romania, Russia, Slovakia, Spain and Sweden and now it has got more than 500 thousand users all over Europe.

Pécs is the second city in Hungary after the capital which hosts Blinkee, the environmentally friendly ridesharing service since 2019. The service has been created through cooperation between blinkee.city and energy supplier E.ON. It is a student-friendly service in Hungary since the motors rent is cheaper for the students than the other users and its zone borders in Pécs were designed in a way to help university students in the city, taking into consideration the distance between the buildings of various faculties that are far apart.

This electric motorcycle sharing system has got a lot of advantages since it is environment-friendly, sustainable, fast and the users can avoid traffic jams with its use. However, it also has disadvantages as its use requires a driving license with category AM which is older than six months, it is not available all the time near the user and it is not much cheaper than a Bolt which is a car-sharing system that is similar to the banned Uber and some taxi companies^[16].

d. electric scooter sharing network

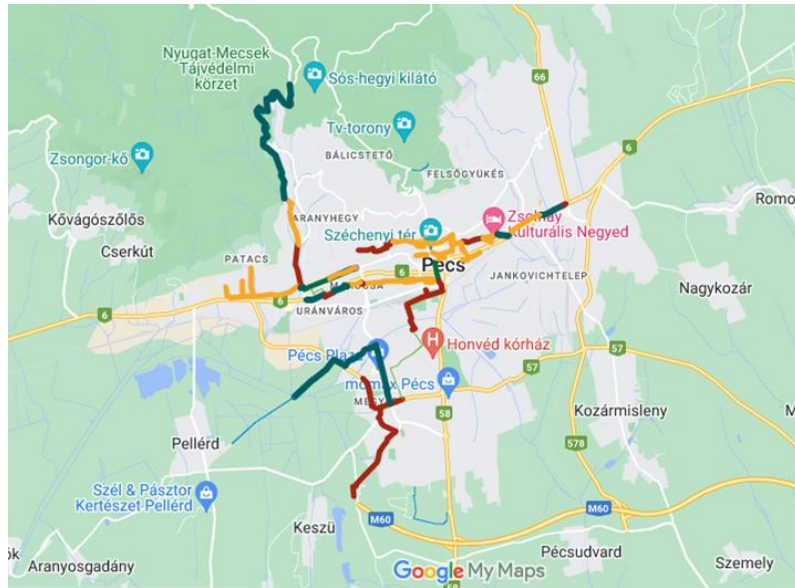
After the carpooling, the car-sharing and the motorcycle rental system I would like to present a newer way of micro-mobility, the electric scooter sharing network. The electric scooter renting system also operates in two of the three Hungarian cities that I mentioned earlier, Budapest and Székesfehérvár. It demonstrates the growing importance of this type of transport that the users of the micro-mobility were duplicated between 2017 and 2018 in the United States of America when the electric scooters appeared among the citizens^[17]. This popularity can be observed also in Hungary because, among many other benefits, scooters are faster than public transport, eco-friendly and not crowded as the urban transportation service is.

In Hungary, the best-known electric scooter rental system is the Lime. The service works in Budapest since 2019 and in Székesfehérvár since the summer of 2021. It became popular quickly in both cities. Its success is shown by the fact that its users have travelled approximately 100 thousand journeys in Székesfehérvár between July 2021 and May 2022 which is a really

good rate in a town what's population is around 100 thousand people. In this period the average travel time by Lime was 7 minutes which shows that people use it on the route that is too long for a walk and too short for a car ride. The curiosity about this type of transport is that it is banned in the city centre of Székesfehérvár as cars, motors and bicycles are for the greater safety of the pedestrian and to guarantee a peaceful space for the inhabitants^[18].

e. bike-sharing

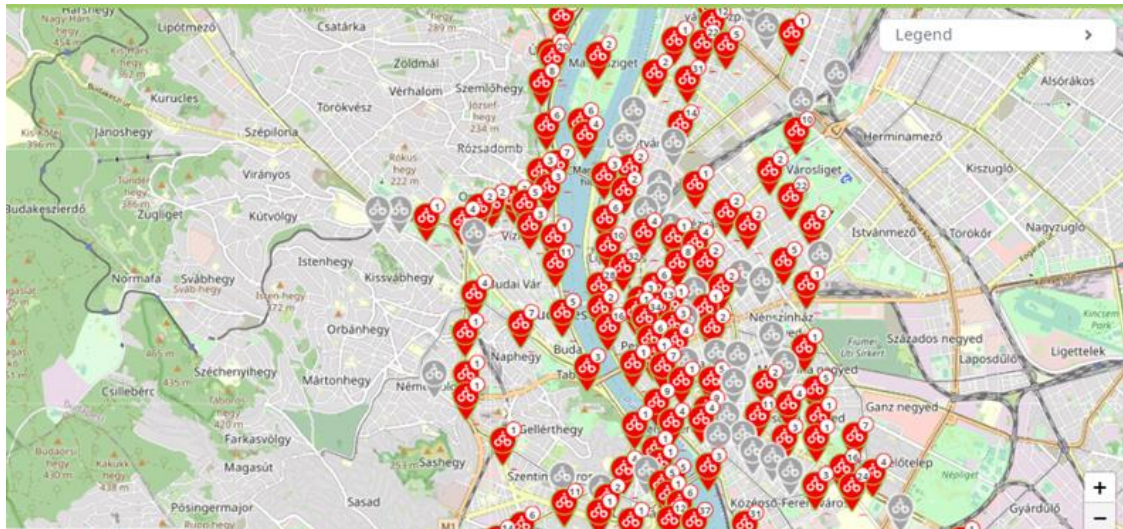
Another micro-mobility option is bike-sharing which is not a very common thing in Székesfehérvár and it exists although it is not very popular in Pécs. In Pécs, there is a public electric bicycle rental system, the Pécsike which is a really good initiative of the municipality of Pécs which maintains the service because it is environment-friendly and a good opportunity for the holiday-makers who do not want to use the public transport especially now since the beginning of the pandemic but it has got a lot of drawbacks as well. One of the biggest problems is that the users of the bicycle have to leave the vehicle after its use in a special docking station and it is trouble because there are only 7 docking stations in the city. The stations are close to the more interesting sights in the centre of Pécs so the Pécsike can be considered useful for the tourists, but I do not consider the number and the location of the stations to be suitable for the inhabitants. In addition, the service is only running from the 1st of March until the 30th of November so it does not provide a travel alternative for the full year^[19]. Another problem is that in Pécs the bike path network's length barely reaches 20 kilometres^[20] which is a very short distance for a large city, like Pécs. The lack of bicycle paths can discourage people from the bike using or cycle renting. However, it is also true that there are large elevation differences in Pécs, but this problem could be eliminated with the rental of electric bicycles after the construction of the cycle paths.



4th picture: The current bike paths system of Pécs.

source: <https://www.google.com/maps/d/viewer?mid=1ICchHt9mkUb6Vnd1NQyiu3NtytySSpBs&ll=46.07336620206683%2C18.24026322248352&z=12> date of download: 2022. 06. 21.

There is a way better option for bike-sharing in Budapest, the capital city of Hungary, than Pécsike, which is called MOL Bubi. This service also offers an eco-friendly and fast travel alternative and it is available all year round. This is also only available in the city centre, but there are 162 docking stations of it so MOL Bubi can be applied over a larger area. One of its biggest advantages is that it is not an electric vehicle so the user can exercise while travelling so it is also good for health. Since it does not require electricity its prices are low. The users can buy a monthly or an annual pass in the service's application which guarantees that the first 30 minutes of each ride started is free and after it, the price of each minute of use is 20 HUF which is approximately 1,2 CZK^[21].



5th picture: map of the MOL Bubi docking stations in Budapest

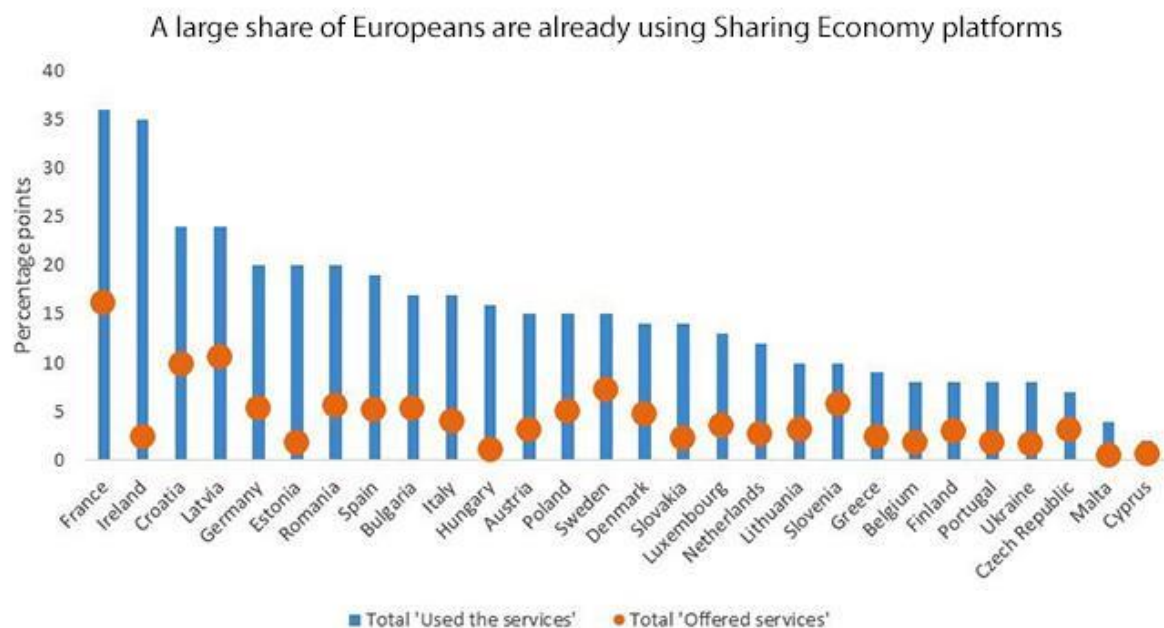
source: <https://molbubi.hu/en/locations/>

During the restrictions imposed due to the Covid-19 pandemic, travel by private vehicles increased from 42% to 75% in Budapest^[22]. It had a bad impact on public transport but it was useful for the spread of micro-mobility because it became more popular. The first period of the restrictions showed which parts of the sharing mobility need development and cooperation between public transport and micromobility services has begun to be developed as well. Based on these, it can be said that sharing mobility can be expected to gradually increase in Hungary.

I. Sharing Economy in France

Digital technologies have had a decisive impact on the growth of the collaborative economy. Since the beginning of Ebay as the first collaborative platform, France has, for the past decade, been known for its use of sharing economy platforms. The economic and financial crisis of 2007-2008 also contributed to its development, with individuals looking for savings and additional income. In 2017, Ryan Winkler, senior economist at the World Bank estimated that French people were the leading European population that not only used the most sharing economy services but also offered the most sharing economy services (See picture below). Though, in France, the collaborative economy, also known as the sharing economy, is a peer-to-peer economy that relies mostly on digital technologies. It is based on the sharing or exchange between individuals of goods (car, housing, parking, drill, etc.), services (carpooling, DIY, etc.), or knowledge (computer courses, learning communities, etc.), with monetary

exchange (sale, rental, service provision) or without monetary exchange (donations, barter, volunteering), through a digital networking platform.



6th picture: source: <https://blogs.worldbank.org/digital-development/who-shares-european-sharing-economy>

According to l'IFOP (Institut d'Etudes d'Opinion et de Marketing or the Institute of Opinion and Marketing Studies in English), 72% of French people think that the sharing economy “conveys an image of a local economic system”. France exploits many sectors of activity to develop its collaborative economy. For example, the housing sector enables rental between individuals, shared accommodation, exchange of apartments, participatory housing. The transport sector allows rental of vehicles between individuals, exchange or resale of transport tickets, carpooling, collaborative delivery, tourist car with driver (VTC). The food sector allows consumer groups, associations for the maintenance of peasant agriculture (AMPA), catering; miscellaneous equipment: sale or purchase of second-hand equipment, donation, loan, exchange or rental of equipment or apparatus. The clothing sector allows rental, donation, barter, resale/purchase of clothing while assistance services between individuals for shopping, DIY (do it yourself), cleaning, babysitting, animal care; culture and education through online courses, tutoring is also tackled.

The collaborative economy in France is developing according to two strategies in the face of the conventional offer: by duplicating classic consumption models (taking a taxi, renting an apartment) but using the resources of individuals and offering services that are absent from the

classic offer (mobile applications, attractive prices, critical feedback on the service, etc.) and by creating a new or complementary service to the traditional offer. This is the example of carpooling, which makes it possible to get to a given destination but according to different methods from traditional modes of transport.

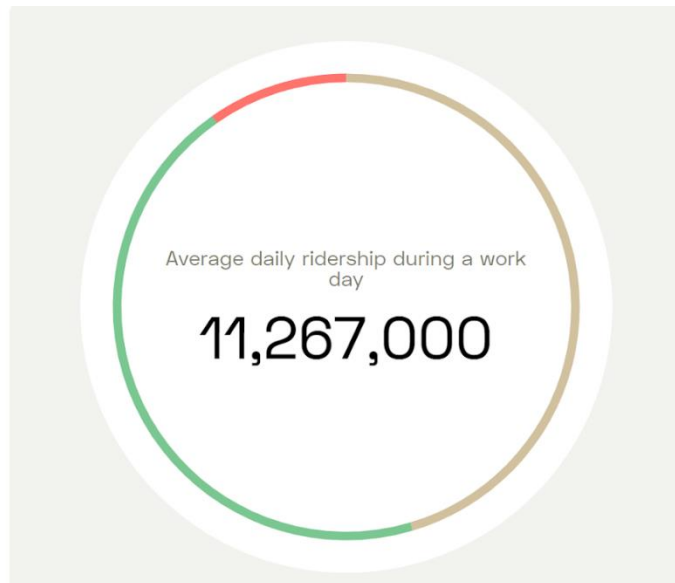
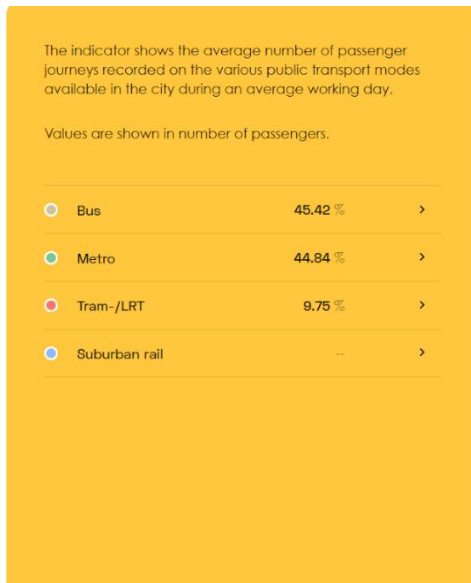
I. Shared mobility in France

With a population of over 11 million inhabitants, the public transport network in Paris is one of the most used in the world. The French capital is a true mobility hub, thanks to its metro system, zero-emission buses, waterborne transports, and myriad shared mobility options. In this part of the work, we will introduce the shared mobility options available in Paris.

a. Public Transports: Metro and Buses

The first Parisian metro saw the light in 1900. Since then, 16 routes have been designed, mostly underground to enable easy transportation throughout the city. All the 16 lines are owned by the Régie Autonome des Transports Parisiens (RATP). Although covering a distance of 226.9 kilomètres with their 308 metro stations, almost every metro stations are accessible for people with reduced mobility. Moreover, according to CityTransitData, more than 44% of the 11 million people that use public transports in the city use the metro to commute (see image below).

The RATP designed some 70 lines of buses reserved exclusively for the city centre of Paris. Along with the other buses that operate in the suburban areas, there are about 9,500 buses in all of the Parisian area operated by the RATP and by other private companies^{[\[23\]](#)}.



7th picture: Source: <https://citytransit.uitp.org/paris/average-daily-ridership-during-a-work-day>

City buses also allow for people with reduced mobility by equipping buses with an electronic ramp allowing rolling on and off. A single ticket for the bus or metro to commute around Paris usually amounts to 1.75 euros but the RATP allows for discounted prices for monthly subscriptions. People can subscribe to a Navigo card that allows them limitless travels in Ile de France. The subscription costs 75.20 euros and most working citizens find themselves paying only half of the price of a Navigo card since their workplace usually contributes to 50% of its monthly cost. As for students, subscriptions differ with varying ages but the most a student less than 26 years old can pay is 35 euros per month.



8th picture: Public transports are equipped to account for people with reduced mobility.

b. Carpooling

Blablacar is the world leader in long-distance carpooling with more than 70 million users in more than 22 countries around the world. This French company created in 2006 employs more

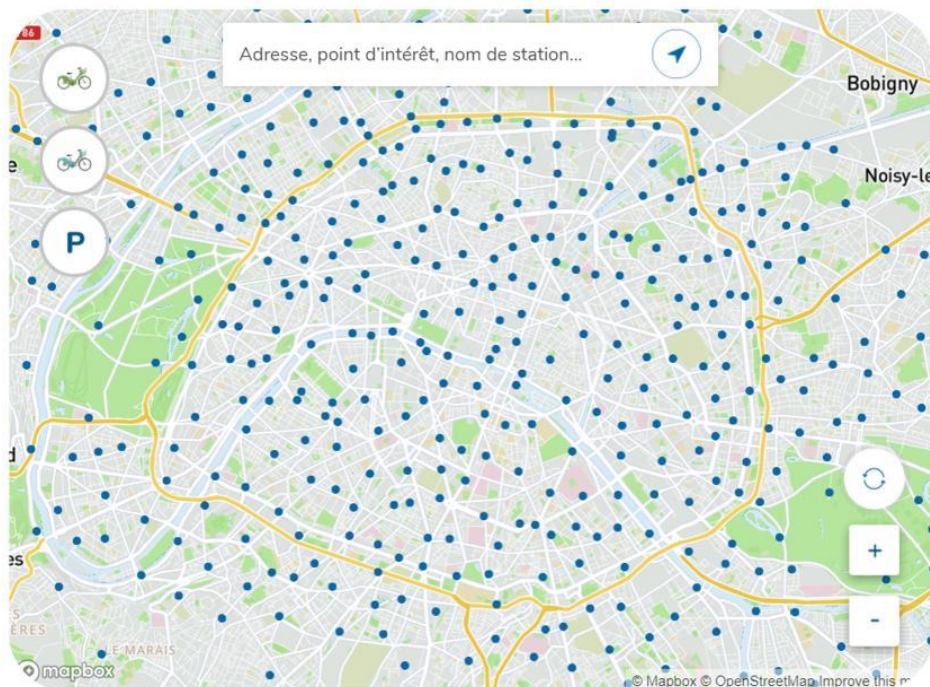
than 350 people and brings together the largest long-distance carpooling community with at least 15 million users in France. Before becoming Blablacar, the company was called covoiturage.fr and in 2008, it was already the most used carpooling site in France. Blablacar also organises trips by bus and calls the service Blablacar bus or blabla bus.

If Blablacar became a unicorn in 2015 after fundraising 1.6 billion dollars, it was not until 2018, 12 years after its creation, that the company announced that it was finally profitable. This profitability was notably the result of a winning strategy of diversification and gradual expansion implemented by its management. Although weakened by the loss of 25% market share following the Macron law of 2015 which liberalised part of the transport sector, Blablacar, during the Covid-19 pandemic, the leader in carpooling saw its attendance drop by only 30% on average when those of the plane and the train fell by more than 60% (according to the Organisation de l'aviation civile internationale (OACI) in January 2021). It even gained market share over these two competitors.

Uber started operating in Paris since December 2011 and has since accounted for more than 350 million trips in all of France! In 2015, French people would talk about the “uberisation” of society when considering the magnitude of collaborative platforms that were emerging while using the name of the start-up “uber” that would at the time not pay their drivers. Since then, the countless controversies that the company had to face contributed to Uber deciding to pay their drivers along with allowing them to have a signed work contract so that they could be seen as employees of the company. Moreover, in 2020, the Parisian Court rejected the request from a taxi federation to ban Uber in France proving that Uber has established itself in the way of life of Parisians.

c. Bike sharing

Paris is full of bike-sharing options such as Mobike or Donkey Republic which are both dockless bike options but Velib' Metropole is the most well-known bike sharer in Paris. With more than 1400 docking points in the Greater Paris area, more than 20 thousand self-service bicycles, nearly half a million users, Velib' Metropole aims at promoting new mobility in Paris.



9th and 10th pictures: All blue dots are Velib' docking points in and around the French capital in 2021.

Source: <https://blog.velib-metropole.fr/2021/08/23/tarifs-jeunes-etudiants/>

What is more convenient is that Velib' metropole has 2 types of bikes since 2018: mechanical bikes (usually green) and electric bikes (usually blue) which are easily identifiable by their colours. Moreover subscriptions to Velib' Metropole are all below 10 euros per month.

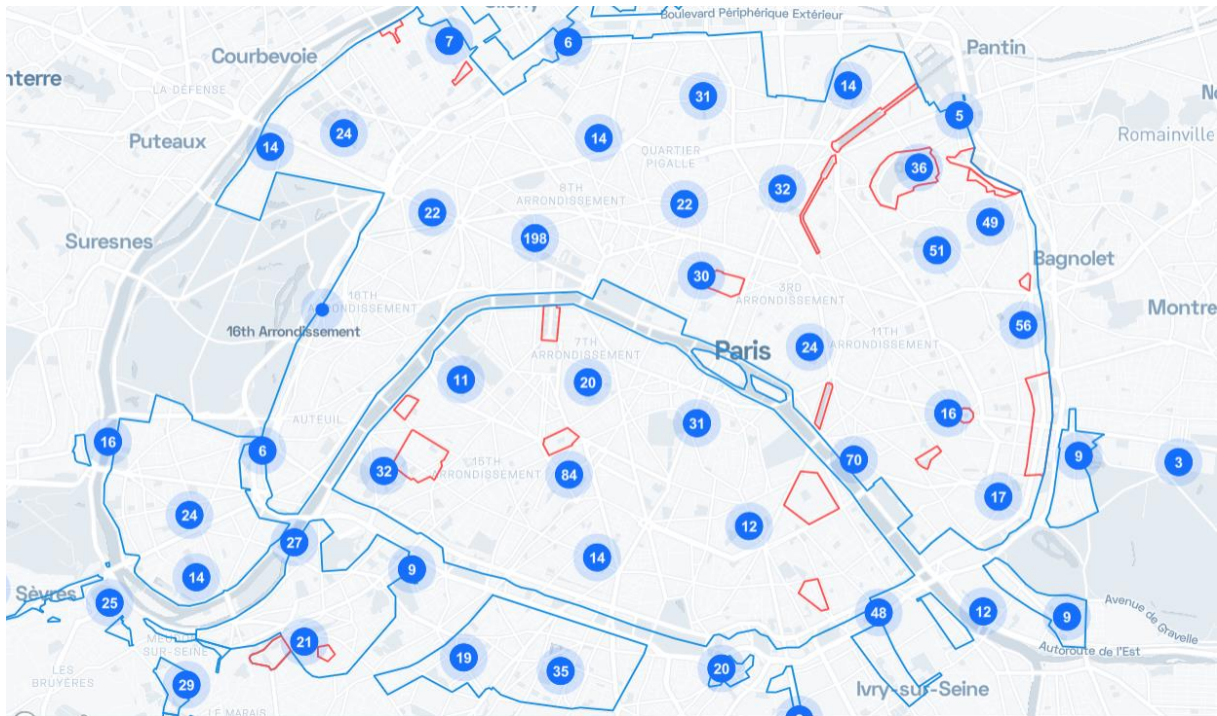


11th picture: Green velib' metropole bikes are mechanical bikes and blue velib' metropole bikes are electric bikes.

To promote biking in Paris, Anne Hidalgo, the mayor of the French capital who has been fighting since 2014 to stop dependence on individual cars, has already secured 1040 kilometres of existing cycle paths and is limiting the car speeds to 30km/h in the centre of Paris.

d. E-scooters

Since 2018, more than 20,000 dockless electric scooters (or trotinettes électriques) can be found in Paris. Those e-scooters are owned by the 12 scooter operators available in Paris although one of the most well-known operators Cityscoot met with a new competitor in 2021: Lime.



12th picture: The numbers indicate the amount of cityscoots that are free to use

Although a very good way to promote sharing mobility, these scooters have caused many accidents. So much that some of them are even limited to 10km/h in some parts of Paris!

In 2020, Anne Hidalgo, Mayor of Paris set up some new laws to promote safety while using these e-scooters. One of the laws includes parking the e-scooters in real parking spaces and not leaving them on the side of the road.

e. Car sharing

Zity is a 100% electric free-floating carsharing service. With the possibility of sharing Renault cars equipped with child seats, the price already encompasses maintenance, insurance, recharge and travel expenses.

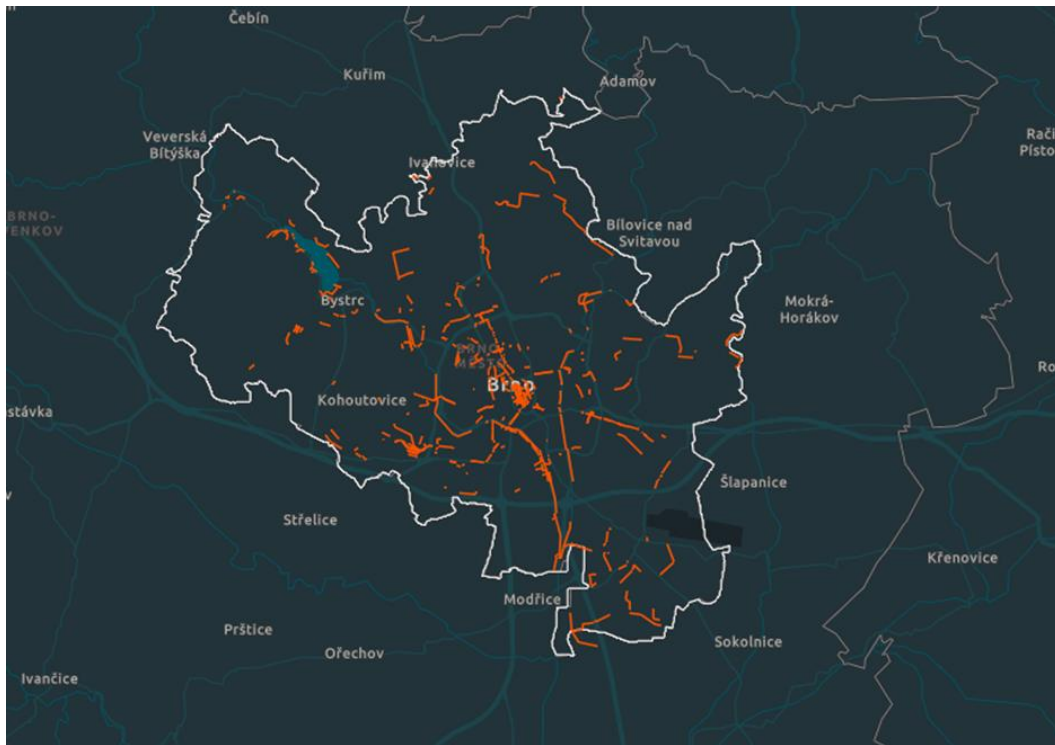
Communauto allows people to book for self-service vehicles. The prices are calculated per hour and per kilometre and the fuel price is included. They aim at allowing people to still be able to have access to cars despite them not owning any cars.

II. Shared mobility in Brno

Sharing mobility has been increasing in importance in Brno in recent years. The offer of sharing is constantly expanding. In Brno, a key document named „Vision of Brno in the Year of 2050” was prepared by experts and inhabitants which contains the development plan of the city. One

of the main aims of mobility is to transform it to be as efficient and sustainable as it can be. The goals include reducing the negative impacts such as emission of transport, increasing the popularity of the environmentally friendly ways of transport, developing micro-mobility and the transport system in the city, supporting, and using innovations in the public transportation and protecting the environment of Brno. Two of the key elements of this innovation are the increase in bicycle transport and develop the bike-sharing system. In addition, that document shows that in 2020 on average 53% of the inhabitants use public transport when they are travelling in the city, 39% use a private car, 6% of people are usually pedestrians and only 2% use the bicycle transport. The goal of Brno is to reduce the private car use of people by increasing the other ways of transport. The strategy contains that the city wants to raise its cycle transportation from 2% to 12% for 2050 and that the extent of use of bike-sharing is 0,4% of the transport, which Brno also would like to increase^[24].

Bicycle use in Brno is also lower than in most of the cities in Europe which can be caused by terrain, elevation and infrastructure as well. These problems with the bicycle use are the same as in the city of Pécs. A statement from one of Brno City Municipality's websites called data.Brno divided Brno into two categories, based on this 73% of the city's area is suitable for cycling and only 27% fall into the category of steep climbs where it is harder to travel by bicycle. In addition, data present that terrain has an impact on the use of bicycles use in cities but with electric bikes and electric scooters, it is possible to increase the popularity of these types of sharing mobility also in a hilly city^[25]. Infrastructure is the other element which can affect bicycle use. The total length of the cycling roads was 136 kilometres in Brno in 2021. It seems effectual, however as the following map shows the cycling infrastructure does not cover the entire city which can be the other reason why people in Brno do not travel by bike more. The other problem is that from this 136 kilometres of cycling infrastructure, there are only 33,3 kilometres that are safe and in good condition.



13th picture: The cycling infrastructure of Brno in 2021. source:

<https://datahub.brno.cz/apps/cycling-in-brno-1/explore> date of download: 2022. 06. 18.

At the same time, the intention to develop is evident as Brno has quadrupled the budget of the cycling infrastructure development in 2019^[26]. In addition, the bicycle rental system is also becoming more popular in the city which can cause an increase in bike use as well.

In Brno, young people and cyclist movements are looking for alternative ways of mobility such as bike-sharing. Tendencies show that in countries which have developed cycling systems, public transport is often connected with bicycle-sharing and managed with applications just like in Czechia. Also with bike-sharing, most of the disadvantages of using a bike appear resolvable because the electric vehicles guarantee an easy ride on hills as well, users do not have to search for a parking space for their bike if they use sharing mobility because of the docking stations or parking zones and it is also a cheap way of travel^[27].

In Brno, there are more bicycle-sharing systems, now I would like to introduce two of them, the Nextbike and the Rekola. Nextbike is a Czech initiative which offers more than 5000 mechanical and electric bikes all over the country, in 25 cities. Passengers can rent a bike through an application at a reasonable price. In Brno, the company provides 400 bikes and there are 250 stations where the users can leave the vehicles after the use^[28]. There is a very good proportion of docking stations compared for example to Pécs, where Pécsike has got 7 stations,

not more for more than 110 vehicles^[29]. The docking station's location and ration in Brno ensure that the shared bike system can be used over a large area not just in the city centre.

Rekola is also working through an application since 2013. This is also a bike-sharing service which is available in four Czech cities (Prague, Brno, České Budějovice, Olomouc) and Bratislava. One of its biggest advantages is that it is stationless, so people park their vehicles in the designated area of the cities, almost everywhere. However, the disadvantage of the service is also related to this, because if the users return bicycles outside the zone, they are charged a penalty of 500 CZK. Luckily, the app warns users about the boundaries of the zones.

There is a national competition in Czechia, called „Bike to work”, which was taking place in May throughout the Czech Republic for the 12th time in 2022. The challenge aims to motivate inhabitants to use bicycles more to be healthier and more environmentally friendly^[30]. This year, Brno was the official partner of the „Bike to work” project. To encourage its inhabitants, Brno made cooperation with Nextbike and Rekola so the users of the bike-sharing services could rent a vehicle for free for 30 minutes, twice a day. With this initiative, Brno City Municipality promoted sharing mobility, bicycle use and eco-friendly life as well. It is important to mention that initiation was useful not only for the inhabitants but for the municipality as well because they could collect information about people's bike-using habits to improve the cycling infrastructure adapting to users^[31].

Another useful transport sharing system which operates in Brno is the shared electric scooter rental service since the 2010s. Brno's inhabitants have got the chance to choose between different service providers, such as Bolt (which company offers car rides as well) or Lime. This service's adopters come mainly from walking, cycling or public transport use, but it also can be an effective solution for those who want to use their car for a short-term road, so electric scooter use is also an option to reduce emissions in the city^[32]. Its use is good not only because it does not cause air pollution but it does not affect noise pollution in crowded areas as well.

Both of these services are working through an application and from this information, it can be deduced that it is used by more youngsters who are comfortable with the digitalized world than those who do not use applications every day. One of the electric scooter sharing system's biggest advantages is, that shared scooters do not need docking stations, the users can leave the vehicles anywhere in the streets where other people can find them. On the other hand, it is also a problem because there are often cases of parking of e-scooters on the roads where vehicles

restrict wheelchair users, baby stroller users and pedestrians^[33]. For this reason, cycling infrastructure development would be also useful for electric scooter users as well if it would be possible for them to use the bike roads instead of sidewalks.

III. Strategy proposals for Brno

According to the United Nations data, the city of Brno has almost 400 thousand inhabitants, which makes it a big city where a lot of people travel every day. In a large city like Brno, the air pollution is big and the traffic jams are common. Approximately 40% of the greenhouse gas emissions in Europe and Czechia as well are due to the use of motor vehicles, like cars and motorcycles^[34]. Adopting sharing mobility programs can be a solution to minimize air pollution, reduce traffic and make the environment more livable. Two of the sharing mobility programs that I would like to focus on in the following pages are the public bike-sharing system and the public use of electric scooters. However, according to the „Vision of Brno in the Year 2050” document, only 2% of the inhabitants travel by bicycle in the city of Brno. Some factors are affecting bike- and scooter sharing systems in the city, which are the followings: weather conditions, build environment, public transport’s success, station number, temporal, socio-demographic impact and safety factors. The last one is closely related to the infrastructure.

a. Cycling infrastructure’s development

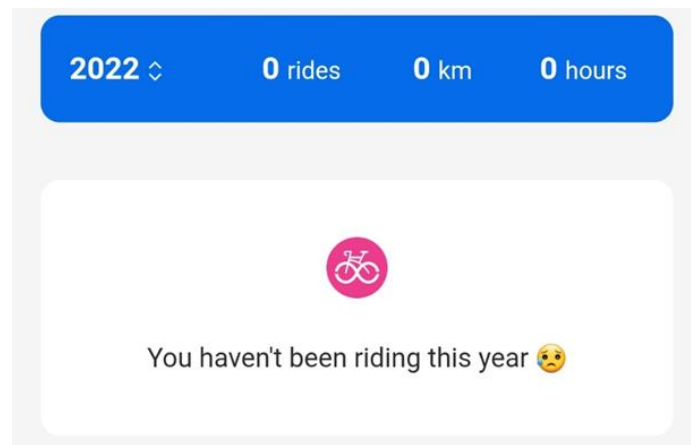
The total length of the cycling infrastructure was 136 km in Brno in 2021^[35], which length is short concerning the size of the city and does not cover its entire territory. According to a study more bicycle usage can be observed in cities with higher levels of cycling infrastructure. The separated sidewalks, bicycle paths and city highways can create more safety circumstances for the travellers and it can cause a higher rate of bicycle use especially when the sharing system is cooperating with public transport^[36]. This is why it would be a good solution for the city of Brno if it would develop its cycling infrastructure by expanding bike paths which can be used by also cyclists and electric scooter users.

It would also boost the bicycle use concerning infrastructure if the parking would be more expensive in the city centre for the car users. This act could give rise to drivers using other transport options in the downtown area, especially when they are planning a short journey inside the city, which can be done by any sharing vehicle. Another option within the topic of the infrastructure is the question of the docking station’s number. It is a really big advantage of

electric scooters that they are stationless, but the system of shared bicycles is based on stations. On average, the proportion of stations is high in Brno compared to the Hungarian examples but it is a fact that better availability is a strong factor for trips by rented bicycles. So, in addition to bike path development, it is also important to raise the number of electric bicycle docking stations with collaboration by public transport to be able to complement each other^[37].

b. Motivating users

The low proportion of bicycle users shows that inhabitants do not motivated enough to use the two-wheelers. With the bike-sharing system's applications, it can be also eliminated. Nowadays, not only the sharing mobility is more important around the world, but a healthy lifestyle as well. Of course, it means, that people do not want to live in an air-polluted area but it also means that most people try to exercise day by day and eat healthily. The public bike-sharing system provides a solution for daily exercise because the users can rent mechanical bikes alongside the electric ones and it allows them to go to work by bike. In bicycle-friendly communities, the levels of obesity, diabetes, asthma, high blood pressure and roadway fatalities are lower^[38]. In most of the bike- and scooter-sharing applications, some counters count how many times the users used the system's shared vehicles and how long was their journey. I believe that it could be an important motivation if there were counters in the applications which are calculating how much kcal had the users burned by one ride with a rented mechanical bike. For those who are interested in a healthy lifestyle, it would be an influencing factor to use the mentioned vehicles. The other counter option which can be motivating is the emission calculator that shows how much air pollution has been spared the environment by using a rented bike instead of a private car. The latest idea comes from the Hungarian State Railways which indicates this information on the passengers online and printed tickets since 2021. As sustainability is more important for people it can also be an operative motivation.



14th picture: The Rekola's current counter. source: Rekola Application. Date of download: 2022. 06. 20.

Besides, it would be a really good promotion for the companies which are the operators of the sharing systems if they could represent their service in community events, such as festivals, markets and concerts, where people could try to drive their vehicles. In Hungary, it is a common thing, that services, like energy supplier E.ON, which is one of the operators of the Blinker e-moped system promote themselves at festivals during the day when there are no concerts and parties, so the festival participants have some free time to get to know them.

Education of the youngsters is almost important in addition to proper cycling conditions and motivating people to use bikes^[39]. For the youngsters, instead of promoting sharing services at community events, the operators could present the sharing mobility in schools, since it is really important to teach the younger to be as environmentally friendly as possible. With the opportunity to try the shared vehicles, like electric scooters, the students could learn also enjoyably and interestingly. Research by Leister et al. presents the 10 potential barriers to using a shared bike including that people do not have any knowledge about how the bike-sharing system is working, so with the school education this problem could be reduced.

According to the study by Leister et al. who used an online survey, only $10.40\% \pm 4.4$ of the shared bike users are older adults^[40]. This can be caused by what I mentioned before, that people do not know the public cycle sharing system and that, they do not dare to use it by themselves. For this problem, I think it could be a working solution if there would be community education events which would be free and available to everyone. In addition, the Municipality of Brno could advertise a tender for Pensioners' Clubs to win a bike for their community. With this act,

the Municipality could encourage elder people to travel by bicycle and it could guarantee that the clubs' members use the vehicles in a shared way, just in case when they need it.

Furthermore, there are lots of companies which provide company cars for their employees who are in a higher positions. This guarantees a cheap way for the workers to travel, as they do not need to buy their private car and companies often pay gasoline subsidies for their employees as well. To be honest, a free private car for the workers is not a necessity. It would be more eco-friendly and cheaper if the companies would enter into a partnership with the bike-sharing services for that their employees can travel by the collaborating system's vehicles for a promotional price. As the Municipality of Brno is also a significant employer in the city, it could also be a part of a partnership between them and a bike-sharing company. Cooperation can be useful for all the members. With this method, the Municipality could enlarge the number of bike users, reduce the traffic, the air and the noise pollution in the city through its example. The collaboration could be good for the public bike- and scooter sharing systems as well because they could increase the number of their systems passengers, who could promote how the sharing system is working. For those who are the employees of a company or the Municipality, it is also a useful opportunity to travel cheaper and reduce air pollution.

c. Introduction of a new way of shared transport

There is another two-wheeler which could make the transport easier in Brno, what is the electric moped. There are more electric motorcycle sharing services in Czechia and also in Hungary which are showing these motos benefits. Electric motorcycles are eco-friendly and quiet and in addition, they are easy to use because the vehicles are often lightweight. The shared motorcycles are useful at a distance that can not be done comfortably with a scooter or a bicycle within the city. Traffic jams can also be avoided with this vehicle due to its size. In Hungary shared motorcycles are popular, especially among young adults. In Brno, it would be purposeful to introduce these rental motorcycles, because this would also eliminate the elevation problems in the transport that force those who want to travel in the city into cars.

In summary, in the last few pages, the focus was on how to increase the use of shared two-wheelers to reduce traffic jams and air pollution in Brno and thus make the environment healthier. This action can happen by cycling infrastructure development, motivating the inhabitants of Brno to use shared vehicles and introducing shared electric motorcycles to the city. The cycling infrastructure development can be done by expanding bike paths, making the

parking more expensive in the city centre for the car users and raising the number of electric bicycles docking stations. The Municipality of Brno could motivate its inhabitants to use the shared system with education, presentation, reform of the services applications, advertise tenders for smaller communities like pensioners and make a partnership with bike-sharing systems operators to be able to reduce the cost of the municipality's employees travel and make it more environmentally friendly. The last solution which was mentioned is the introduction of a shared electric moped system which is a useful and well-working service in Prague and some Hungarian cities as well.

d. Get the inhabitants involved

It is very important to get the population involved in the decisions of what and how to adapt more sharing economy measures in their everyday life. Contests can be organised by the Municipalities of the Brno metropolitan area so as to award the winners with a cash prize allowing them to implement their ideas in the city centre. The Implementation of digital platforms to enable the inhabitants to participate in decision-making and city life can also be a good idea but their interface should be thoroughly worked on by UX designers so that anyone at any age can use the platform without any difficulties. For example, in Paris, idee.paris is an open platformed destined for Parisians to formulate their ideas and develop their proposals for their city. Paris has also set up imaginons.paris, an e-petition system that allows the inhabitants to fight for their values and beliefs to implement changes in the general way of living in the city and along with this idea, jemengage.paris is a platform where Parisians can volunteer to participate in projects involving setting up new measures for sharing economy. Moreover, Paris also has the application DansMaRue which can be translated to "On my street" to allow inhabitants to report any problems that they might see or encounter in public spaces and the results showed that inhabitants were eager to use the application with DansMaRue receiving some 3000 reports per month.

e. Getting science and innovation involved

Science and innovation play a big part in convincing people about living in a new way. It helps to see the pros and cons of every situation in a non-biased way and help to bring credibility in the findings. In Paris, there is a body called the City of Paris Scientific Advisory Board that issues opinions on cases and the questions they receive and from that they send proposals and recommendations to the City Hall. Moreover, there is also the CIFRE partnership grants in

Paris, CIFRE representing the Industrial Agreements for Training through Research. As a result of this program, 10 to 20 young doctoral candidates are hired by the city of Paris yearly enabling them to gain in professional experience while benefitting from their expertise and research. Moreover, Brno can also make use of the expertise of their talented students studying in engineering schools such as Brno University of Technology or the Czech Technical University in Prague to promote new sharing economy-oriented ideas.

I. Conclusion

Sharing mobility is a broad concept and the spread of this project is not enough to give a complete overview of the topic. However, we tried to collect the most common elements, tools and applications of the concept of sharing mobility through examples from France, Hungary and Brno.

In Hungary, sharing economy and shared mobility have become a significant issue in the last few years due to the increase in pollutant emissions and vehicle traffic. Carpooling, carsharing, motorcycle-, bicycle- and electric scooter sharing have become common ways of travel since these are both environmentally friendly, cheap and available transport options. Identifiable, carpooling is outstandingly successful nationwide based on the Motar ride-sharing system, which has more than 900 thousand users in Hungary, for a population of fewer than 10 million people. It means that out of 100 people, more than 9 are using the Motar system's application and sharing their rides because they believe, that it is a beneficial form of travel for the whole community. This high rate can be caused by its well-working application which offers the drivers and the passengers the opportunity to know each other and provides a lot of other information about the rides through advertisements of the users and the representative counters as well.

Other successful sharing systems are the electric motorcycle-, electric scooter and carsharing systems. Public carsharing service is only in the capital city of Hungary since the other cities in the country are not large enough to require the service in addition to public transport and other shared vehicle usages (Hungary's second-largest city is Debrecen, with a population of 203 thousand people^[41]). However, motorcycle- and electric scooters sharing systems are also in county capitals, such as Pécs or Székesfehérvár, too and they are successful as well. In Pécs, the Blinker electric motorcycle rental system is a solution for the hills which are in the city for those who do not want to use bicycles on such high terrain.

In terms of bicycle use, Pécs and Brno face very similar difficulties with the hilly environment and the short cycling infrastructure. There are chances to rent a shared electric bike in both cities, which can be a solution for the first problem and the cycling infrastructure development can be the disentanglement for the second. The main difference between the two cities' electric bicycle-sharing systems is the number of docking stations. While there are only 7 stations in Pécs, in Brno, this number is more than 250, which makes shared two-wheelers more available in the Czech city than in Pécs.

When it comes to Paris, we can easily see the benefits of sharing economy and this is also a big reason why Parisians are very present when it comes to participating in establishing ideas and projects that contribute to Paris' sharing economy. Since the beginning of Ebay, France has been innovating with sharing economy by getting technology involved. Sharing economy, a concept that has revolutionised industries and disrupted the traditional notion of ownership represents many advantages: lower costs, higher flexibility, optimisation and efficient use of resources and a consumption model that produces less waste. When it comes to sharing mobility, Paris is a model city to learn from as we spoke about the various sharing mobility possibilities in the French capital. Though, despite those possibilities, bike and scooter theft are still very much present in the city centre. In addition to those thefts, it is not seldom to find bicycles and scooters abandoned in La Seine. So, despite sharing economy being very present in the city centre, pollution is still going on through the items that contribute to collaborative economy.

In Brno, there are only 2% of people who are using a bicycle in common and there are only 0,4% of the inhabitants who are choosing shared bikes instead of other vehicles. This ratio is lower than the European average^[42]. This can be caused by the short size of the cycling infrastructure and also the terrain. The latest problem can be eliminated just like in Pécs with the shared electric scooters and bicycles, which systems have lots of advantages but still have to be able to adapt to people who are not necessarily comfortable with technology. However, it is important to keep in mind that sharing economy is not the answer to every societal problem we are met with and that as everything around us, it has advantages and disadvantages. For example, the principal reason for Anne Hidalgo, mayor of Paris, deciding to limit the speed of e-scooters is because of the increase in number of deaths due to e-scooter accidents that Paris was experiencing. All that we know for sure is that the sharing economy sector is undoubtedly a booming one!

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