



E L V I T E N

Recommendations for Planning Authorities emerged after COVID-19



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0 Introduction

In spring 2019, after 18 months of preparatory activities, the partners of ELVITEN deployed the demonstrations in six European cities. Their goal was to collect data from the pilot cities to analyse and provide guidelines and recommendations on how electric light vehicles (EL-Vs) can be used in urban areas and be integrated into the existing transport network.

The partners of the project did not know that, within a few months, pilot experimentations would become a privileged observatory to understand the effects of the pandemic on the users' behaviour and new mobility needs of European citizens. Thanks to the analysis of the data collected in the pilot cities, it was possible to obtain useful indications on how the EL-Vs services responded to users' needs and to adapt them to a new scenario derived by COVID-19 implications.

This document is intended to offer to planning authorities some recommendations related to light electric mobility that take into account the results and experience acquired within the ELVITEN project, reviewed and integrated in the light of the evidence, trends and market drivers observed during the pandemic period.

The needs and habits of users have been profoundly changed by this pandemic and will have repercussions in the years to come. Our belief is that these lessons learned can help planning authorities to propose new mobility models adapted to the new context, which will affect urban transport systems at least in the short and medium term.



1 The ELVITEN project

The ELVITEN project started in November 2017 and lasts 36 months.

Its vision is to propose replicable usage schemes, consisting of support services, ICT tools and policies, to boost the usage (ownership or sharing) by private and professional users of all categories of EL-Vs (bicycles, scooters, tricycles and quadricycles) and to demonstrate them in 6 European Cities (Bari, Berlin, Genoa, Malaga, Rome and Trikala) with three principal aims:

- to make users more familiar and facilitate them to use EL-Vs instead of ICE vehicles for their private transport and for light urban deliveries,
- to collect rich information sets made of real usage data, traces from dedicated ICT tools, and users' opinions after real trips,
- to generate detailed guidelines and business models for service providers, Planning Authorities, and manufacturers to make EL-Vs more attractive and more integrated in the transport and electricity networks.

Since ELVITEN aims at organising long demonstrations of its usage schemes, its overall approach is based on the guidelines of the FESTA European project, thus it is split in three phases, Preparation, Usage and Analysis.

In the *Preparation phase*, ELVITEN analysed the mobility demand in each of the Demonstration Cities and identified the usage schemes and potential number of users based on each city's mobility conditions and patterns. A demand analysis model identified potential coverage areas, namely the areas with the biggest demand for EL-Vs. ELVITEN also created profiles of potential ELVITEN users in each City to understand who would join the demonstrations and at what scale.

After a short verification period, the *Usage phase* started, where the real demonstrations took place. This phase ended in June 2020. However, during the demonstrations, the data was continuously checked for quality and completeness and the methodology efficiency was assessed. In case of issues, the necessary corrective actions were immediately undertaken, so that the demonstrations could continue. In the just started *Analysis phase*, the analysis of the logged trip data will shed light on the real driving patterns of EL-Vs in each city and on the most used locations for parking and charging. Analysis of users' experiences and described problems during the trip will depict among travel patterns, also potential issues like EL-Vs stability, issues in interaction of EL-Vs with other road users, with other vehicle categories (L, M, N) and with traffic elements, both analysed per user type, gender, occupation and trip purpose.

1.1 The pilot cities

As it is already mentioned, ELVITEN project envisaged long demonstrations of light electric vehicles (EL-Vs) usage in six European cities [1].

Trikala offered five 3 Wheelers (L2e-P) for long-term sharing by delivery companies and five 4 Wheelers (L6e) vehicles for short-term sharing since April 2019. The city also offered 18 L1e-A electric bicycles for short-term sharing since September 2019. The registration process for the short-term sharing in Trikala



was done at the Municipality's Info point desk, at the city's Central Square, accomplished by a human operator. A valid ID and a Category A scooter driving license had to be presented. The registration for the long-term sharing was done at the e-Trikala premises.

Hubject in **Berlin** offered 10 eScooters (called ZeroScooters) via a long-term sharing scheme, which means that users could rent a scooter for free for three weeks in a row and act like the owner of the vehicle, i.e. take it home and to work and be responsible for charging it etc. This process could be done via the ZeroZone Website where people could apply for a specific three-week-cycle.

Malaga offered 40 L1e-A vehicles for long-term sharing. Users have been selected after the fulfilment of a questionnaire which collects information about the future usage of the vehicle by users: each question gives the user different points according to their answer, then the users are classified and the first are called to collect their bicycle. 15 e-hubs were installed in the parking lot of the Tabacalera, as the majority of the of users were working close to it.

In **Bari** residents and commuters were the main target groups for the public short-term sharing scheme with 10 electric bicycles. Users picked up and leaved the vehicles at one of the 10 e-Hub parking positions, which were installed near to the city centre at "Caserma Rossani". The 65 EL-Vs of the long-term sharing scheme have been assigned to commercial activities operating in food delivery such as pub and restaurants, to small parcels delivery, to the Polytechnic University of Bari, to the Municipality of Bari, to Apulian Aqueduct and to the Municipality of Rutigliano. The users of the ELVs were the employees of the Apulian Aqueduct, Polytechnic University of Bari, Municipality of Bari, and Municipality of Rutigliano. The vehicles have been assigned to each of these organizations that provided private parking spaces and charging points and were also take caring of the management and maintenance of the vehicles, and other similar activities. About 10 vehicles are managed by Apulian Aqueduct, 5 vehicles by Municipality of Bari, 5 vehicles by Municipality of Rutigliano, about 10 vehicles to commercial activities for parcels delivery and the others are have been used by different departments of Polytechnic University of Bari.

The vehicles and e-Hubs provided to **Rome** follow the same usage model as those provided to Malaga and Bari. Basically, the e-bikes were directly assigned to public and private companies which signed a long-term loan agreement with the Municipality and selected, among their employees, the users. This model was used following the decision to limit the number of e-hubs installation in the Municipality which pushed us to turn the open sharing service into several companies' internal sharing systems. This model was thought to drastically reduce the risks for vandalism and theft by empowering the single users through their companies. the signed agreements with these companies provided that the bicycles would be used in rotation by the employees who would register for the service at the Municipality IX EUR.

Genoa offered 10 3 Wheelers (L2e-P) for long-term sharing to members of their Regional Support Group through a loan for free. Private EL-Vs were also invited to join the demonstrations and currently 11 private EL-V vehicles have joined. 3 charging hubs were implemented in the city centre near the two biggest train stations.



1.2 ELVITEN usage scheme

Therefore, as illustrated in the previous sections, ELVITEN developed two main categories of usage schemes [2] in each demonstration city. The first was for EL-V sharing (meaning short-term rental, typically less than one day) and the second aimed at EL-V owners. Each city tailored the schemes according to its own needs and identified challenges, as well as according to the types and number of EL-Vs provided as part of the demonstration. Usage schemes' similarities are highlighted to ensure consistency among the schemes, to demonstrate the interoperability of applications between the demonstration sites, and to model how to access and operate the vehicles.

Below are summarized the different types of usage scheme that have been envisaged.

Public short-term sharing scheme:

- The EL-V is available for anyone to use (resident or visitor), subject to them being legally permitted to drive the vehicle (possession of valid driving licence where required).
- Targeted users can include commuters, students, personal/leisure use, tourists, short business trips within the city, etc.
- It should be easy for a user to register (via an app, website, telephone, face-to-face, etc.).
- The maximum rental time is typically set for a few hours.
- It may be either required to return the vehicles to the same station or may allow one-way usage with return to a different station.
- EL-V stations will be positioned at locations with highest expected demand, also considering multimodal trips.
- EL-V use may be motivated by offering free parking at selected locations, convenient charging and parking, and other incentives based on points earned with usage.

Private (individual) ownership scheme:

- It is aimed at encouraging citizens to purchase an EL-V instead of an ICE vehicle.
- Information campaigns on EL-Vs, education on types of EL-V available and their features, information on available financial incentives such as low-cost loans or use of eco-cheques are required.
- Facilities for the EL-V sharing scheme that are also available to EL-V owners may be publicised, e.g. apps for navigation, charging and payment roaming, serious game, collecting bonus points, or infrastructure like parking or charging facilities.

Delivery sharing scheme

- The aim is to familiarise delivery companies with EL-Vs by allowing them to use one or two vehicles for a short trial period e.g. one or two weeks, or a longer one e.g. several months, free, without any commitment or need to purchase.
- EL-Vs appropriate for light goods transport (parcels, food delivery, etc.) will be rented out to different companies for trial use, on the condition that trips are logged and that the fleet manager and driver(s) provide feedback via the questionnaires.
- Specific parking / charging infrastructure and IT tools (apps) can be offered where relevant.



Delivery ownership scheme

- This scheme is like the private ownership scheme, except it is aimed at delivery companies, not individuals, and the EL-Vs are appropriate for light goods transport.
- It can be complementary to a delivery sharing scheme (allows company to try the vehicles for free for a short period, before making any purchase decisions).

Corporate sharing scheme

- This scheme works on the same basis as the delivery sharing scheme, except it uses EL-Vs for passenger transport, leased for a certain period to a large employer (company, public administration, etc.) for their staff to use (for example for short business trips in the city).
- The company/administration takes care of staff registration and usage policy, with guidance from ELVITEN.
- The vehicles would normally be stationed on the company's premises, where charging facilities would be required.
- Staff using the vehicles will have access to the ELVITEN apps and other offered facilities and motivation systems and are expected to provide feedback via the questionnaires.

Corporate ownership scheme

- This is like the corporate sharing scheme, except the company owns EL-Vs for their staff use.
- Motivations may be given, as for the other usage schemes, as well as advice on any available incentives that are not within the scope of ELVITEN (e.g. tax breaks as mentioned under 2.2.4 Delivery ownership scheme).
- It can be complementary to a corporate sharing scheme (allows company to try the vehicles for free for a short period, before making any purchase decisions).



Photo 1, 2: L1 vehicles in Bari



Photo 3: The ZeroFleet in Berlin



Photo 4: 3-wheeler vehicle in Genoa



Photo 5: 4-wheeler Duferco vehicle in Genoa



Photo 6: L1e-A RadRhino 2017 ebike in Malaga



Photo 7: L1 vehicle in Rome



Photo 8: 4-wheelers L6e vehicles in Trikala



Photo 9: 3-wheeler L2e-P vehicle in Trikala

2 Most relevant experiences in the emergency phase in Europe and worldwide

In the last months of the ELVITEN project, COVID-19 has changed the public perspective and the behaviour of mobility markets behaviour across the world. After the initial alarm, millions have been confined inside their homes without being able to go out but to carry out basic activities. This situation can certainly change the electro-mobility market status-quo, as it is shown in several studies analysing demand variation during COVID-19 crisis. At the beginning of the COVID “crisis” and before the mandatory lockdown, an increase of the demand of electric bicycle sharing services has been observed worldwide. For instance, Billy Bike, in Brussels [3] has doubled its demand. In New York, provider Citi Bike increased its usage rate by 67% [4]. Providing individual transport, easy disinfecting and open-to-the-air vehicles, EL-V sharing services have become more attractive to the public. Also, fear to use public transport is steadily redirecting demand from these services to EL-Vs.

Public transportation is changing because of population fear to contagions. Furthermore, restrictions have been implemented to ensure public safety. Reducing public transport capacity, mandatory use of facial masks or respecting social distancing in every public transport mode are some of these measures. They mean increased inconvenience for the user, who is forced to look for new alternatives for daily commuting or usual transport. Alternatives such as vehicle sharing services reduce exposure to the virus while being less restrictive and more convenient. These characteristics make the user more willing to use these services. The graph below visualises the demand for public transport services in Madrid during the COVID-19 crisis: as can be seen, from mid-March to mid-May, demand for public transport services is drastically reduced.

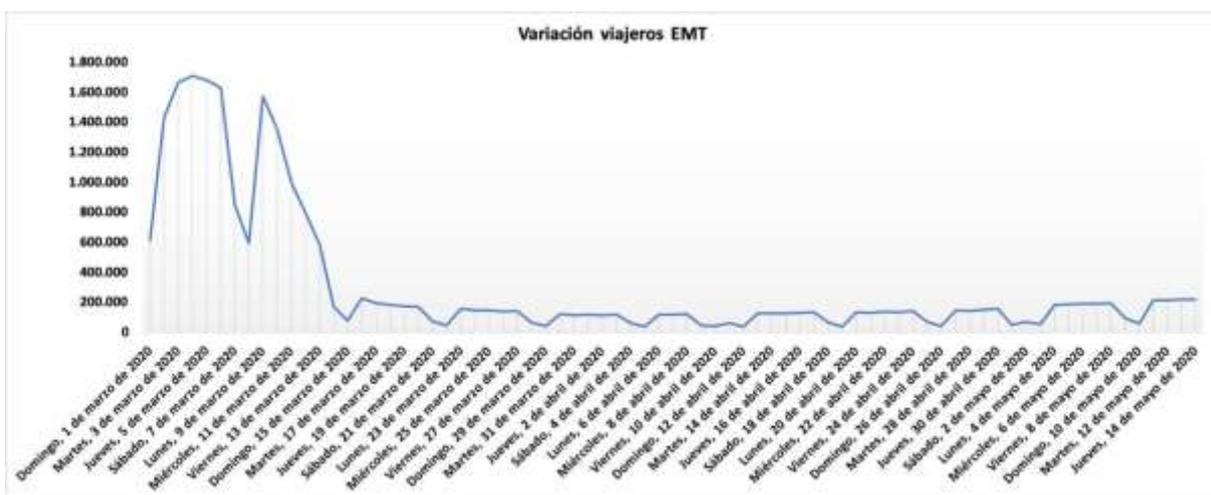


Figure 1: Demand of public transport services during COVID-19 crisis in Madrid

Also, after the COVID-19 crisis, the global EL-V market is forecasted to grow, especially in developing countries as India, where 30 to 40 percent of electric scooters are expected to be electric in the next 7 or

8 years [5]. In the first affected country by COVID-19, China, the charging stations sector has grown its new installed infrastructure by 513,000 public and 714,000 privately-owned charging stations, an increase of 43.8 percent compared to 2019 [6]. Not only in developing countries but also in developed ones, EL-Vs are forecasted to become a main actor in mobility, increasing their share from 5-10% to 30% [7]. EL-V markets are becoming more attractive for both private and public transport; their business attractiveness has therefore increased in comparison with the pre-COVID-19 context. In the following graph, we show the public e-bike sharing service demand in Madrid, where there is a clear trend emerging:

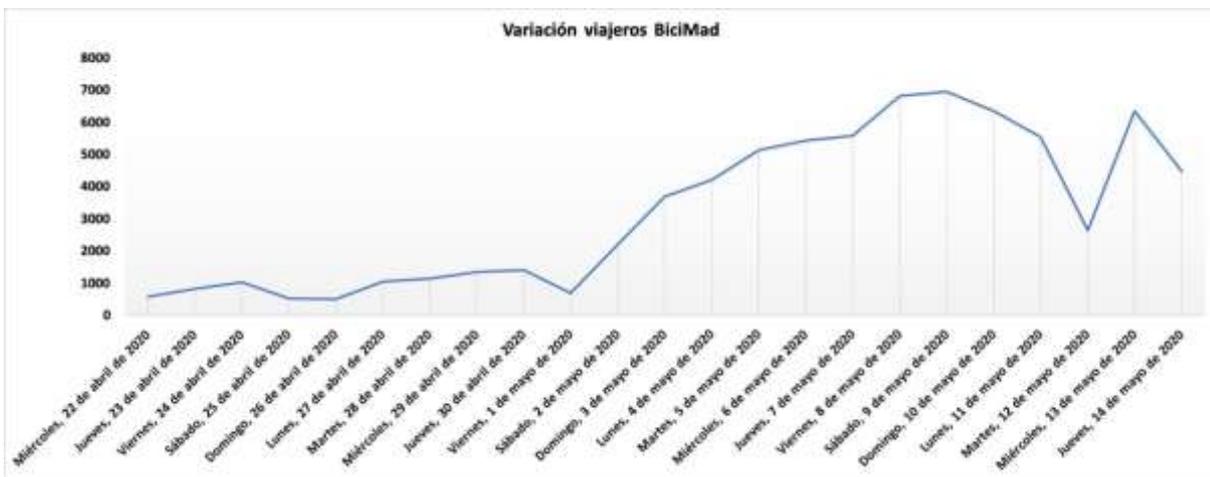


Figure 2: Public sharing service demand in Madrid during COVID-19 confinement

In this scenario, the different European mobility service providers are reinventing themselves to make their services more suitable to customers' needs. For example, Sharengo, the Italian company founded to allow the sharing of electric cars in the city, has promptly developed a new proposal to adapt to the disruption brought to the sector by the coronavirus pandemic and launched MySharengo, which allows the long-term rental of cars. Unlike car sharing, where you take the car and leave it after the race, with MySharengo you can rent a car for a period ranging from a month to a year. The car will be delivered sanitized and equipped with a kit, which includes the Sharengo Card, with which you can open and close the vehicle, charging cable, user and maintenance manual of the car, disinfectant gel, reflective vest and emergency triangle. [8]

As an example of the implementation of mobility as a service (MaaS), a new way to plan your urban travel by booking all the necessary means of transport from a single platform and paying by subscription or forfeit, can be mentioned Helbiz, the Italian company that launches Helbiz Unlimited, the first subscription in Italy for sustainable mobility that allows you to pay for the rental of scooters and electric bikes in a single solution. [9]

The pandemic has also affected the purchasing power of households, so service providers will also face an additional challenge: making their services accessible to a population in economic difficulty. According to industry experts, each household spends around 20% of its assets on transport every year [10]. In fact, in the immediate post lock down period, it was seen that within the automotive market there

was a collapse in sales, but the first market that registered a surge was that of EL-Vs, supported also by national incentives [11].



3 Detected changes in user behaviour during the emergency in ELVITEN pilot cities

The demonstrations run for 1 year in each ELVITEN pilot city and in all of them the demand has suffered the effects of confinement and COVID-19.

Below is reported an analysis of what was observed, focusing both on the changes found during the lockdown and on how mobility demand changed with the first reopening.

3.1 General overview

In the following table, the numbers of trips during and post confinement shows a clear trend:

City	Average trips/month (start pilot- Feb 2020)	Trips in March 2020	Trips in April 2020	Tips in May 2020	Trips in June 2020
Bari	326	269	10	870	1,628
Berlin	328	277	293	331	136
Genoa	218	260	214	128	224
Malaga	377	578	165	417	320
Rome	571	764	318	834	425
Trikala	511	593	454	980	1,123
Total	2,229	2,741	1,454	3,560	3,856

Table 1: Demand analysis in ELVITEN pilots during COVID-19 situation

During the confinement, demand drastically dropped due to the interdiction for citizens to leave their homes and mandatory telework when applicable. However, once restrictions began to lift, demand increased to surpass the average pre-COVID-19 scenario in more than 800 trips per month. This data supports the hypothesis previously described, showing that users are more interested on EL-V services because of EL-Vs characteristics and the possibility of maintaining social distancing while commuting or undertaking daily urban trips. This trend will keep increasing services demand once restrictions are completely lifted in each urban area where ELVITEN vehicles are deployed.

Not only the current situation helps the EL-V market grow but also their environmental impact, which is a big social challenge which EL-Vs can contribute to: EL-Vs have lower emissions and their CO₂ emissions are decentralised. These advantages are also coupled with remarkable economic benefits, because an EL-V is cheaper than a motor vehicle and its maintenance and operation costs are also lower. This makes EL-Vs a very promising alternative to public transport and private commuting. To sum up, the main COVID-19 effects on EL-Vs markets that are emerging are as follows:

- Increasing demand for EL-V sharing systems.
- EL-Vs allowing easy disinfecting in individual transport.
- EL-V market growth, especially in developing countries.
- EL-Vs as a suitable alternative to public transport and commuting.

3.2 Usage scheme adopted during lockdown

By observing user behaviour in the pilot cities, it was possible to monitor which usage schemes were used during the lockdown period and how the mobility trend was performing:

- The envisioned usage schemes for Malaga city are the corporate sharing scheme and the users are individual public workers. In Malaga, during the lockdown, all the users remained the same and no new registrations were made. Due to the rules that came into force restricting the possibility to travel, there has been a significant decrease in mobility.
- Genoa is concentrated on private (individual) ownership schemes, delivery ownership schemes and, also use 3-wheeled for delivery sharing schemes. Among the ownership usage schemes, during lockdown, there was a stop in the use of EL-Vs for leisure travel, and a reduction in the use of EL-Vs for trips to the workplace and for deliveries.
- The e-bike sharing system planned in the city of Rome foresees the public short-term sharing scheme and the corporate sharing scheme. The general use of vehicles during the lockdown diminished drastically as restrictions to movement were adopted at national, regional, and local level. The usage schemes remained the same except for leisure use. Basically home-work movements and home-goods shopping for necessity reasons were the main usage schemes preserved.
- The usage schemes that are implemented in Bari are mainly the public short-term sharing scheme, the delivery sharing scheme and the corporate sharing scheme. Only 10 trips were made during the lockdown because e-bikes were stopped.
- The Berlin demonstration was designed to exploit usage schemes already put in place and so that it can use data provided by third parties managing sharing/renting business services of EL-Vs in Berlin and owners. Specifically, the Berlin demonstration aims to derive data from three different user schemes: the public short-term sharing scheme, the private (individual) ownership scheme and the delivery ownership scheme. Within the three schemes, six different kinds of user types can be identified: the sharing-commuter, the ownership-commuter, the tourist, the city centre based employee, the leisure user and the delivery employee. Due to the lock down there was a mixed usage of the ELV's in which some users did not use the bikes all that much since they worked / studied from home but in the case of some other users maintained their usage as they wanted to avoid the use of public transport for their essential trips like going to the super market.
- The envisioned usage schemes for Trikala city include public short-term sharing schemes and delivery sharing schemes. During the lockdown, the 4 wheelers did not operate as the Infopoint (Trikala's registration office for ELVITEN) has shut down. However, the 3wheelers continued to



operate with the companies as deliveries were not stopped. E-bikes were given long terms and maintained their usage.

3.3 Citizens' interest after lockdown

Afterwards the lockdown phase, the use of electric vehicles has changed and the demand for mobility has increased again.

Indeed, the pilot cities have detected the following changes in citizens' interest in EI-Vs:

- In Malaga, the users that already had vehicles showed interest in keeping them after the lockdown. There were also a few more requests in the participation survey – those users were contacted, and they joined the project.
- In Genoa, the citizens have started to buy e-bikes and other e-vehicles (especially kick scooters). The change is supported also by the national money incentives. Citizens are no longer motivated to take public transport, therefore there has been a greater demand and use of alternative vehicles. However, the number of trips of ELVITEN vehicles shown in the Table 1 in the month of May has decreased. During the lockdown, vehicles have been used to assistance and volunteers' activities, in May this kind of support to people is decreased, thanks to an increase of movements authorized. In the meanwhile, people, in majority, has continued to work from home (e.g. Public Administration will work from home until 31 July as minimum).
- In Rome, after the lockdown, interest in more sustainable and individual modes of transport has grown a lot. This was partly caused by national measures that encouraged the purchase of bicycles and e-bikes and by local measures aimed at realizing new cycling paths.
- In Bari, some users asked to continue using the e-bikes while other preferred to return them as they continue smart working. However, especially for private company and transport inside the city, there is an increasing demand for bike and EL-V because they are a useful alternative to cars and public transport.
- In Berlin, the interest in EL-Vs grew higher, because the citizens wanted to avoid public transportation.



4 EL-V's role in future scenarios

Cities are therefore facing a new challenge; administrations will have to propose new mobility models to tackle travellers' fear of using public transport and to prevent cities from becoming car centric.

According to data collected in the pilot cities, in the future there will certainly be a possibility for electric mobility, particularly for two-wheeled vehicles, as they make it possible to move more easily in cities that risk congestion due to the low use of local public transport and the consequent increase in private mobility.

In **Trikala**, regular bikes are already very popular and there is a growing interest in e-bikes as well. This was evident by the requests for e-bikes that users made at the Municipal Infopoint in the Central Square of Trikala, where people can rent free bikes. This urged Trikala to obtain 18 e-bikes additionally to the ELVs (3 wheelers & 4 wheelers) that were already operational in ELVITEN. Having a long and fruitful cooperation with the Municipality helped and boosted the usage of e-bikes, as well as the incentives offered.

Since Trikala is a medium sized flat city, people were a little sceptical towards the usefulness of this still little-known means of transport. However, as more and more people are starting to use EL-Vs, they were being more satisfied (few problems reported) using them than regular bikes and hence, they were choosing them as a valid and regular choice for their travels. As most citizens own their own bikes, they would also like to own EL-Vs.

Sharing schemes are still popular, especially among students and visitors; in Christmas time where Trikala hosts one of the biggest Christmas theme parks in Greece, this is used to the maximum. Therefore, it is highly probable that while the most popular usage scheme will be private ownership, sharing will also have great potential.

In **Berlin**, the small electric scooters are still deployed within the city in terms of sharing services but are not as popular as the other free-floating sharing services like EMMY. The list of problems of owning a private car is only getting more problematic as the time passes. Most parts of the inner city are not very suitable for cars anymore and bike lanes are starting to dominate big parts of the city core. In terms of practicality, electric scooters may be a solution for the mobility of the future, but the pilot city found a lack of incentives in their use: for example it would be useful for administrations to create a regulatory framework for e-scooters to be allowed to travel on bus or bicycle lanes.

In **Malaga** during the first stages of the lockdown due to the current situation regarding COVID-19, the Spanish Ministry of Transport, Mobility and Urban Agenda reduced the capacity of people allowed to travel by public transport within the local areas at least of 50% [12]. On one hand, this led to people using more private mobility such as cars and motorcycles that assured keeping the distance between the users and other citizens, as recommended in a "Good Practices Guide" by the Ministry of Health for the transportation to work [13]. On the other hand there is a notable increase in the usage of bicycles and electric scooters, thanks to subsidy initiatives for the purchase of both means of transport, and with a great increase in the bicycle demand since May 2020 by 14% in Andalusia [14].



Some of the users that participated in the ELVITEN pilot for Malaga have contacted Promálaga to show that, in order to travel within the city during the lockdown, they were only using the EL-Vs, substituting private vehicles such as cars. A survey of the use of e-bikes on several European cities carried out in 2019 by the cycling equipment company Shimano and YouGov demonstrated how 39% of Spanish citizens are willing to incorporate an electric bicycle in their daily transport [15] [16]. This shows that electric light vehicles are a feasible alternative of other means of transport and, with the aforementioned increase of bicycles demand, vehicles with characteristics like the L1e-As could be adopted in Malaga in order to increase the usage of electric transport.

In Spain the aim for the post-COVID-19 scenario might be to find the potential users that are already willing to participate in a more sustainable way of mobility, showing them the advantages of using (both sharing and buying) electric light vehicles and motivating them to share their experience with the local Public Authorities and with their contacts. It is also essential to publicise with the precise relevance the “Plan Moves” and other Governmental subsidies for the acquisition of electric vehicles [17] [18]

In **Genoa** there was an evident change in urban mobility after lockdown: the private mobility is increased while public transport users have decreased. EL-Vs can be an alternative, especially e-bikes and kick scooters.

In the new post-COVID19 scenario ELVITEN usage schemes that could be more successful are the private ownership, those that are related to citizens’ personal use, workers, and delivery companies. Instead, a decrease in the use of electric vehicles for corporate ownership is expected, due to the tendency of companies to use smart tele-working.

In **Rome**, EL-Vs can arguably be considered the successors of the scooters (50 Cc) as their performance equals that of these vehicles and possibly can also replace the use of private cars, ICE vehicles and local public transport. Much of this ambitious success will depend on the incentive policies and local facilities put up by national and local governance. Italy’s government and Rome Municipality (Roma Capitale) already issued several initiatives to promote the use of EL-Vs through economic incentives to purchase the vehicles.

In **Bari**, after the first few months since COVID-19, travel was shorter and private mobility increased compared to TPL. EL-Vs can be an alternative, due to the confirmed increase in the number of bike and e-bikes in the city. The increase in the use of EL-Vs can also be achieved by national and local initiative to incentivize these vehicles (refund of a percentage of the purchase price).

The usage schemes that could be more successful in the future are those related to commuters and deliverers. In the first case are related to people who are not working in smart modality but in offices, and EL-Vs are useful for the home – work travel. The second usage scheme is justified by the high number of home deliveries (especially by shops in the food sector) even after the reopening.



5 Recommendations

The lesson learned from the experiences lived during emergencies are:

SAFETY becomes a fundamental driver for the redesign of the service offering

The USERS' HABITS are changed revolutionizing the demand system

REGULATION POLICIES are required to orientate the behaviour of the different user groups to facilitate the planning of services

TECHNOLOGICAL TOOLS are increasingly important to enable data collection and data analysis, to facilitate integration between different platforms in a constantly evolving scenario and to give prompt and immediate access to the services eliminating human interaction (as required by post covid-19 social distancing regulations)

PARTNERSHIP WITH PRIVATE OPERATORS are required to renew and to develop the offer of innovative services, widely accessible and integrated with other means of transportation

ENVIRONMENTAL SUSTAINABILITY will have to be re-launched: the COVID-19 pandemic has presented unprecedented challenges but it also offers an unique window of opportunity to rebuild economies in a way that reinforces the close links between human wellbeing and a healthy environment

The Covid-19 pandemic has put cities all over the world to the hard challenge, generating rethinking of citizens' mobility and travel habits. There was a drastic drop in the use of public transport due to a reduction in bus, metro, and tram transport capacity.

According to the majority of experts [19], the crisis linked to the Covid-19 emergency is likely to have permanent effects on existing urban mobility systems. This is true both in the medium term, with the need to adapt to the safety requirements defined for post lockdown and subsequent phases, and in the long term, when we will have to verify the real impact of the crisis on the behaviour of citizens, which will be consolidated over time.

Administrations will have to make their **planning tools increasingly dynamic**. Companies will have to focus on increasing adaptive capacity by seeking to better integrate, refocus and in some cases diversify their offer.

The need to adapt to a progressive change in **safety rules** in the medium term requires both administrations and service providers to equip themselves with regulatory and economic instruments to ensure a faster reaction time. In this case the key word is flexibility: the challenge concerns the need to involve a plurality of actors to develop an **integrated and efficient offer**.

Up until recently, many major mobility providers either did not communicate directly with cities and public transport agencies or did so in a minimalist approach. The challenge now is to bridge the gap, take lessons learned, and coordinate data specifications, standardization, and legislation in an open, transparent fashion so both the public and private sectors can work towards **shared outcomes and goals**.



Cities can take a central role in determining their future and **setting the policies and legal frameworks** for new market entrants in the electric and electric shared mobility domain to succeed financially and operationally.

The current situation exposes the mobility sector to the real risk of an exponentially increasing and therefore **unsustainable use of private mobility**.

Public Authorities are called to redesign urban space to facilitate an efficient diversification of the mobility offer. Infrastructures suitable for the coexistence of different transport modes and flow types, but also safe and intelligent interchange nodes.

Smart mobility, ITS and Mobility as a Service are therefore fundamental tools to overcome the challenges of post COVID-19 scenario.



6 References

- [1] «ELVITEN DELIVERABLE 4.1, Set-up and first demonstrations activities, October 2019».
- [2] «ELVITEN Deliverable 1.2, ELVITEN Usage Schemes and Functional Requirements, June 2018».
- [3] «Number of electric bike journeys has doubled, says Billy Bike,» *The Brussels Times*, 04 2020.
- [4] J. Hazan, P. Marteau e B. Fassenot, «« Toutes les conditions sont réunies pour un retour irréversible de la suprématie de la voiture individuelle »,» 06 05 2020. [Online]. Available: https://www.lemonde.fr/idees/article/2020/04/26/toutes-les-conditions-sont-reunies-pour-un-retour-irreversible-de-la-suprematie-de-la-voiture-individuelle_6037800_3232.html.
- [5] «ET Auto,» 06 05 2020. [Online]. Available: <https://auto.economictimes.indiatimes.com/news/industry/indias-electric-story-to-continue-to-be-dominated-by-light-mobility-post-covid-19/75284206>.
- [6] «Renewable Energy World,» 06 05 2020. [Online]. Available: <https://www.renewableenergyworld.com/2020/03/30/covid-19-brings-the-growth-of-chinas-charging-station-sector-to-a-month-long-halt/#gref>.
- [7] K. Heineke, B. Kloss e D. Scurtu, «Micromobility: Industry progress, and a closer look at the case of Munich,» McKinsey Center for Future Mobility, 2019.
- [8] «Sharengo,» 2020. [Online].
- [9] «Helbiz,» 2020. [Online].
- [10] K. Huhtala-Jenks, Head of Ecosystem & Sustainability, MaaS Global.
- [11] J.-L. Di Paola Galloni, Corporate Vice-President Sustainability and External Affairs, Valeo Group (TBC).
- [12] Ministry of Transport, Mobility and Urban Agenda, “mitma.gob.es,“ 03 2020. [Online]. Available: <https://www.mitma.gob.es/el-ministerio/sala-de-prensa/noticias/dom-15032020-1248>.
- [13] Ministry of Health, “mscbs.gob.es,“ 2020. [Online]. Available: <https://www.mscbs.gob.es/en/gabinete/notasPrensa.do?id=4857>.
- [14] A. Arranz, “El Economista,“ 03 06 2020. [Online]. Available: <https://www.eleconomista.es/nacional/noticias/10582841/06/20/La-demanda-de-bicicletas-aumenta-un-260-durante-mayo-con-vistas-a-cambiar-el-modelo-de-transporte-en-Espana.html>.



- [15] Shinamo, "rideshinamo.com," 2019. [Online]. Available: <https://www.rideshimano.com/spain/es/el-39-de-de-los-espanoles-se-pasaria-a-la-bicicleta-electrica-para-ir-al-trabajo/>.
- [16] J. Oortwijn, "Bike Europe," 09 04 2019. [Online]. Available: https://www.bike-eu.com/sales-trends/nieuws/2019/04/study-reveals-widespread-e-bike-adoption-coming-10135676?_ga=2.245641988.1813338975.1594886171-1356729740.1594886171.
- [17] E. Rey, "Pásate a lo eléctrico," 16 06 2020. [Online]. Available: <https://pasatealoelectrico.es/2020/06/16/el-gobierno-de-espana-empana-su-camino-hacia-una-movilidad-libre-de-emisiones/>.
- [18] Challenge, Ministry for Ecological Transition and Demographic, "Agencia Estatal: Boletín Oficial del Estado," 17 06 2020. [Online]. Available: https://www.boe.es/diario_boe/txt.php?lang=en&id=BOE-A-2020-6235.
- [19] G. Grea, «Citytech live,» [Online]. Available: <https://citytechlive.com/2020/05/25/gabriele-grea-articolo/>.



About ELVITEN project

The vision of ELVITEN (*Electrified L-category Vehicles Integrated into Transport and Electricity Networks*) is to propose replicable usage schemes, consisting of support services, ICT tools and policies, to boost the usage (ownership or sharing) by private and professional users of electrified L-category vehicles (bicycles, scooters, tricycles and quadricycles) and to demonstrate them in six European Cities:

Bari, Berlin, Genoa, Málaga, Rome, and Trikala with three principal aims:

- to make users more familiar and facilitate them to use electrified L-category vehicles instead of ICE vehicles for their private transport and for light urban deliveries,
- to collect rich information sets made of real usage data, traces from dedicated ICT tools, and users' opinions after real trips,
- to generate detailed guidelines and business models for service providers, planning authorities and manufacturers to make electrified L-category vehicles more attractive and more integrated in the transport and electricity networks.

Our values:

- Commit to more innovative and more sustainable transportation in Europe.
- Support shared electric mobility for urban travellers and delivery companies.
- Pursue smooth market deployment for a greener urban future.

Our work:

- Demonstrate the advantages of EL-Vs in six European cities.
- Integrate existing charging stations into in a wide, open platform for users.
- Incentivise the use of EL-Vs for occasional and regular urban travellers through easy-access tools.
- Analyse trip and user data to make recommendations available to public authorities in other European cities

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