Picture: Janez Nared

NEWSLETTER **11 | 2022**

SMART-MR Farewell

After six years of inspiring cooperation among eight European metropolitan regions (Ljubljana, Oslo, Gothenburg, Helsinki, Budapest, Rome, Barcelona and Porto), the SMART-MR project has reached its terminal station. What a journey! We travelled through eight metropolitan regions and various topics in the fields of mobility and spatial planning. Each station was full of wonders, new experiences and nice memories, each a small stone in the final mosaic of our common endeavour – to make metropolitan regions more liveable. Enriched and enlightened by the thoughts of experts, we returned home with new ideas, knowledge and solutions. Hopefully, some of them were put into practice in local and regional policies, thus improving the mobility conditions in respective metropolitan regions, and some of them might influence future decisions here at home.

When contemplating the achievements of the project, there is a constant echo of Nejc Zaplotnik's thought: "Anyone pursuing a goal will be left empty once it is achieved, but whoever finds a way, will always carry the goal inside." From this perspective the project was not only a process of common learning, but a real journey. Some of us travelled the entire way, other colleagues joined us in-between and some left for other challenges and destinations. In all cases I enjoyed the spirit, enthusiasm, trust and respect we as a group were able to build. And I will miss this after the project ends. I am grateful for all the steps we made together and filled with memories of friends who have made this journey so memorable. Thanks!

Janez Nared

SMART-MR
Interreg Europe

European Union
European Regional
Development Fund

SMART-MR: Sustainable measures for achieving resilient transportation in metropolitan regions

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e-Workshop 5:
Managing transportation – processes

Picture: Simon Nyitrő

5.1 Introduction

The transportation sector took the biggest hit in the COVID-19 pandemic. Restrictions and other protective measures profoundly affected mobility, especially in cities. Transport authorities, managing companies and transport service providers had to rapidly adapt to the pandemic situation and to prepare for a new normal. In order to discuss the topic, to exchange experiences and to gather good practices on managing transportation during and after the pandemic, a workshop was held on the 20th of April 2022.

The workshop started with a keynote speech by Dr. Zsolt Denke, mobility management expert at BKK, who explained how the BKK Centre for Budapest Transport as the public transport authority was handling the COVID-19 situation in Budapest. He pointed out, that public transport was hit by the pandemic very severely, and that the public transport system is not flexible enough to constantly adapt to the rapidly changing situation during waves of pandemic. Despite dropping passenger numbers and revenue, the system had to remain the backbone of the city's transport system, and with increased capacity due to social distancing. BKK has emphasised the importance of communication campaigns to regain the trust of passengers. In order to flexibly adapt to the situation, BKK also introduced new digital tickets, developed a new mobile application called 'BudapestGO', extended the possibility of bicycle transport on public transport vehicles and made steps to shift the morning peak period in order to meet new crowdedness and distancing needs. The second keynote speech was delivered by Dr. Tamás Fleischer, a researcher at the Centre for Economic and Regional Studies, who put mobility management into a wider perspective. He distinguished three important approaches to the subject: managing mobility after the outbreak of the pandemic, after the end of the pandemic and during the period after lessons were learnt from mistakes. In the first section, the delay before reaction is crucial; transport authorities were running after the cases. In the second case, he explained how society and business will always want to get back on the same track, while the long-term vision of having a liveable and sustainable city stays unchanged. As for the third, Dr. Fleischer emphasised, that learning the lessons from mistakes is currently missing, but a necessary and important task at all levels of control of the pandemic.

After the keynote speeches the responses of partners on managing mobility during and after the COVID-19 pandemic were overviewed, based on a pre-filled inventory. The workshop continued with group discussions to mutually understand and learn from partner experiences and best-practices about how to manage mobility in this new normal situation.

5.2 Inventory results

The Inventory collected experiences from all the partner regions. One of the most relevant indicators of mobility in and around cities is the modal split, which shows the share of different transport modes in a certain area. Partner responses show, that there was a massive shift in the modal split from public to individual modes of transport caused by the COVID-19

pandemic, resulting in a drop of passenger numbers on public transport, and at the same time an increase in individual transport modes, especially car traffic. In order to avoid the negative effects of increased car use, different push and pull measures were introduced to promote active modes, like walking and cycling. As ticket sales dropped dramatically, public transport authorities and companies faced huge losses of revenue, which had to be compensated by governments, regions and municipalities. Partner cities performed massive communication campaigns to promote public transport and alternative modes of transport, to reduce car use.

In the majority of partner cities, public transport capacity remained at the same level as before, however in certain regions there were temporary reductions of service during waves of pandemic that were driven more by closures and restrictions than infection rates. As passenger numbers in public transport will not reach previous rates spontaneously in the mid-term, cities are actively trying to convince people to return to public transport use. Partner cities plan to increase their public transport capacities rather than reduce them, despite the reduction in passenger numbers caused by the COVID-19 pandemic, which is a good path towards a carbon neutral Europe in 2050.

During the pandemic in most cases similar measures were introduced to protect passengers and drivers, like suspending front door only boarding (even closing the front doors in buses) and on-board ticket sales, disinfection of vehicles, compulsory use of masks, cashless only payments or reducing vehicle capacities. The measures taken more or less followed the waves of pandemic and were withdrawn afterward, with the exception of mask use, which lasted long after case numbers had dropped. In the future, more protected driver areas are planned due to the push back of cash payments.

During and after the pandemic, public transport authorities observed the changing tolerance of passengers towards crowded vehicles. In this respect partners were asked whether they had performed a crowdedness tolerance test. Most of the partner cities had not, however an increase in complaints showed the declining tolerance of passengers towards crowdedness. In the Gothenburg region a tolerance test was performed, which showed, that passengers accept only 50% seat occupancy after the COVID-19 pandemic, compared to the 100% seat occupancy and 30% standing occupancy that had been tolerated before.

Measuring changes in mobility behaviour was increasingly important during the pandemic. While traffic surveys are performed by transport companies and authorities on a regular basis, and the methodology of the surveys did not change a lot during the COVID-19 pandemic, some regions made extra surveys or increased the survey frequency. In order to protect passengers and staff, some cities changed survey methods from on board to outdoor, and from personal to virtual ones. This resulted in an increased use of digital tools and survey methods, like extra applications, mobile phone data, floating car data and the use of smart cameras and video surveillance.

As mobility habits changed in cities during the COVID-19 pandemic, there was an increased need from the citizens to reallocate public space. In most cases the street layout was changed converting a car lane into a bus lane or bicycle lane (so-called pop-up bike lanes) in order to limit the increase of car use and gain space for sustainable modes of transport. In other cases, pedestrian developments were made, or parking lots were converted into terraces, as the reallocation of public space and to support local businesses and restaurants. In some partner cities traffic calming measures were taking place, additional bicycle parking was provided, or physical access to medical institutions was made easier. Most of these measures were withdrawn after the state of emergency, however the pandemic shed light on the long-term need for redistribution and restructuring of public spaces.

5.3 Workshop results

During the workshop participants were randomly divided into two parallel groups, each with a moderator from BKK. The subjects were split within the groups, and the workshop concluded two discussion rounds. Between the two rounds, groups were rearranged to exchange members. In this way all the participants could discuss all subjects, which were the following:

- Financing public transport.
- The effect of missing revenue on long-term investments.
- Long-term effects of positive and negative changes in mobility.
- Adaptive governance for a more resilient transportation system.
- The future of public transport in a changing world.
- Lessons learned for local authorities.

After the group sessions, the main findings and results of each group was summarised during a wrap-up session. Participants found that the financial construction of public transport should be restructured, as costs have been increased, while a big part of revenue has disappeared. Investments have been re-evaluated in the light of changing travel habits. Participants agreed, that the number of travels is not the goal itself, rather the modal split, and that travel mode share is what counts. To attract users, not only distinct lines have to be improved, but focus should be placed on improving intermodality and developing the travel chain in a wider perspective. Evidently, temporary measures such as pop-up bike lanes help cities in crisis. The pandemic and similar crises are both a challenge and an opportunity because there were some good developments too. For example, improving data collection and management makes governance more adaptive and management more resilient. Both are crucial for the survival of cities. The role of public transport was discussed from several aspects by the participants. Some say that public transport will begin to wane in cities, but may have a much bigger role regionally. Others tell that because public transport was never at the centre of infections, it will regain passengers in the long-term. In order to make the transport system more resilient, it is important to better understand the needs of travellers. One way to make public transport more flexible is to develop demand responsive transportation. As transport and land use planning are closely related, the shift towards sustainable modes, such as walking and bicycling should be followed by spatial planning. The COVID-19 pandemic has shown us that swift change is possible; we can adapt very quickly with appropriate motivation. The increase in telework has reduced demand for mobility. We could use this phenomenon to our benefit: with limited demand, we use less capacity and less energy, which also means less pollution.

Picture: Simon Nyirő

5.4 Policy recommendations

Picture: Simon Nyíró

Crisis management

- Make temporary actions the norm, if they generated positive feedback among citizens and were effective.
- Keep the positive results of crisis, and further develop them, while trying to mitigate negative effects.
- Provide a platform and opportunity to evaluate good and bad examples.
- Use as much information as possible when evaluating the needs of travellers, such as socio-economic features, travel habits and geographical differences within the city (e.g.: where does car traffic originate, the city or the agglomeration?).

Secure financing

- Save costs by renewing public service contracts.
- The State should support public transport at the regional level and prioritise public transport as the backbone of the city's transport system. Car related taxes should be redirected to support public transport.
- Remind stakeholders that public transport is a core service in the city (especially regarding sustainability), thus it is important to invest into it.

Be resilient

- Transport systems should be more resilient in general.
- Test different scenarios in case such a crisis appears, be as flexible as possible, and try to be better prepared. Do not be afraid of making mistakes, policies can be reverted. Act quickly.
- Changes can happen rapidly, and we should be open to them. Be brave to change and let change happen. We cannot go back to the old normal. We must realign plans in accord with the new normal, while not losing focus of the larger goal of sustainability.
- Use change in a positive way by setting new objectives.
- Collect and use data for planning and forecasting to become more resilient. Reduced latency and real-time data are the keys to a more resilient planning system.

Public transport as the backbone

- Ensure and promote safety of public transport for passengers.
- It is important to brand and promote better public transport.
- Try to flatten passenger demand curves at peak times.
- Public transport should be more flexible and adaptable to a wider variety of uses.

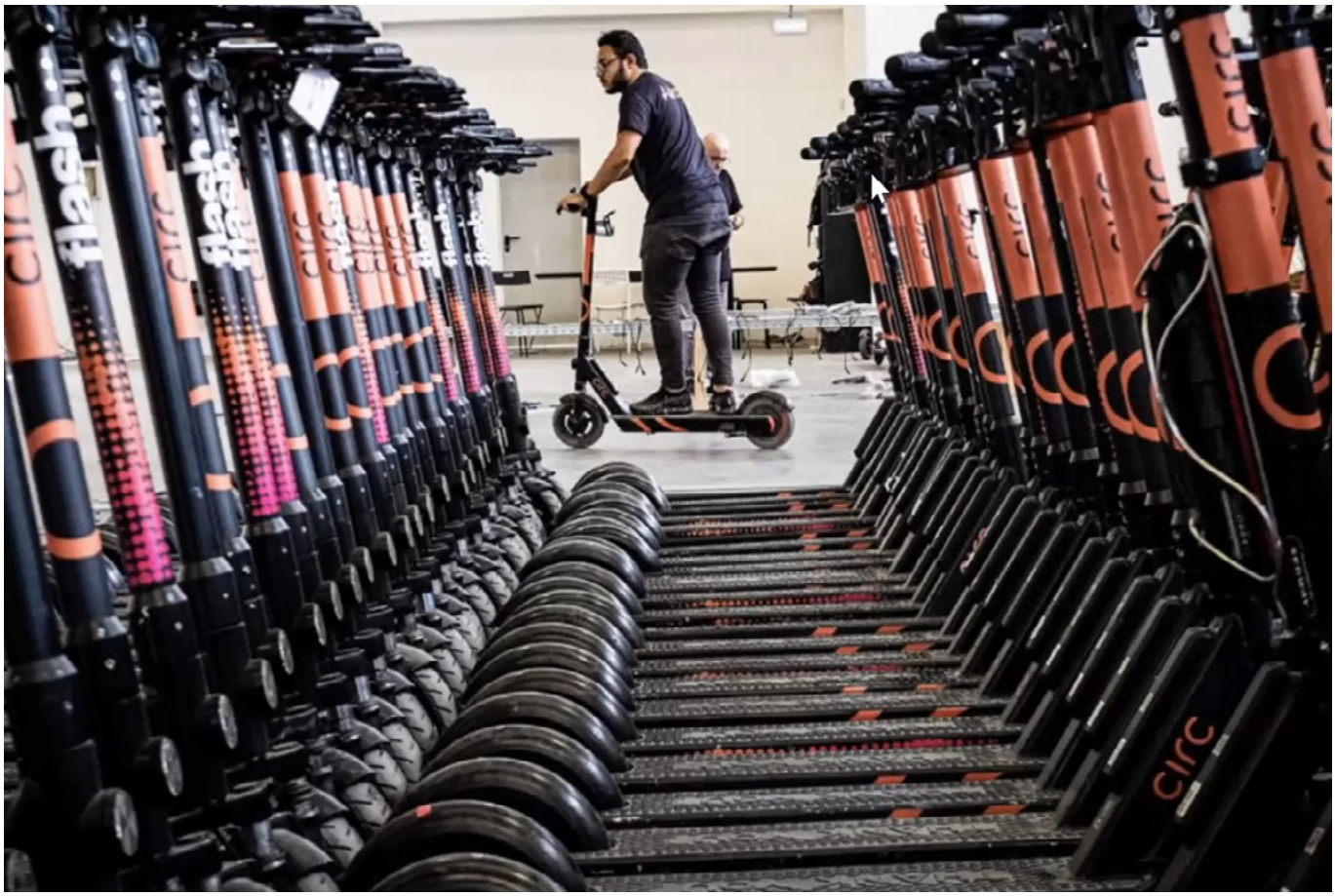
Keep long-term goals

- Existing investments into public transport should be maintained and increased in response to climate change.
- At EU level a common methodology should be used and resources provided to measure the modal split.
- Long-term objectives have not changed because of the pandemic, they should remain the same, there is only a shift in the process.
- Develop Mobility as a Service (MaaS).

Diána Kimmer and **Balázs Fejes**

e-WORKSHOP 6:

New and traditional mobility solutions in a post-COVID-19 world: Managing transportation – reactions/responses



Picture: CEIIA

6.1 Introduction

SMART-MR partners and stakeholders from eight metropolitan regions met in Porto in October 2018 to address the new business models of the sharing economy with impact on the cities' mobility.

They exchanged ideas and practices about the provision of public transport services, their use and the use of various "collaborative platforms". They also debated the interconnection between different transport networks and mobility platforms and the concept of Mobility-as-a-Service (MaaS) which aims to facilitate access for people to move around through the integration of different transport services. In other words, participants tried to answer the following questions:

- What are the roles of transport authorities in the planning and management of the new sharing economy?
- Should local Administration play an active role?
- What are the impacts of new business models on traditional public transport?
- How will the planning of urban space change?
- Which solutions for the sharing economy exist in the legislation of different metropolitan regions?

Metropolitan regions have an important role to play in the planning of sustainable mobility, in the digitalisation of transport and in multimodal solutions. The context is characterised by environmental and ecological awareness, growing urbanisation, high expectations of personalisation, flexibility and integration in the consumption of mobility services as well as openness to the "sharing" or "collaborative" economy.

And then, the pandemic, telework, the change of mobility patterns in metropolitan regions, the new challenge of mobility management in this uncertain context.

In our post-COVID-19 world, it is important to revisit some of the subjects we worked on in 2018 and see how metropolitan regions have responded to this new context.

The main subjects discussed were the following:

- New mobility demand management measures (e.g. regulating and promoting the use of e-bikes, e-scooters, shared mobility, and ticket systems).
- Investing in the right types of physical and digital infrastructure, for example, data platforms to support better transport planning, better integration of data and new mobility services with integrated intermodal ticketing systems, infrastructure to improve walkability and active travel modes.
- Set-up dedicated platforms to foster public/private collaborative innovation.
- The MaaS concept (joining the forces and

resources of public transport and shared mobility services).
- Rethinking governance models to enable better integration, efficiency and collaboration.

6.2 Inventory results

The partners shared their practices on the impact of the COVID-19 in four main topics:
- Changes in the policies or regulations that regulate shared transport.
- Impacts on the use of shared vehicles.
- Managing public transport in a pandemic.
- Digitalisation, including integrated ticketing, payment and real-time passenger information.

On the first topic, all partners referred to the scooters. We should highlight that in 2018, when we made the first inventory on this subject none of the metropolitan regions mentioned the word scooter. Now in consequence of an increased number of shared e-scooters and e-bikes, metropolitan regions are producing regulations related to so-called “micromobility” vehicles, namely regulation of the implementation of the shared motorcycle system, parking spaces, speed limits, the integration of micromobility into the transport system, alcohol control (are e-scooters the same as bicycles in terms of regulation?). Other new regulations on this subject were measures to directly finance citizens for the use of public transport, new discounts or urban transport for elders, children and young people, disabled and war veterans, financing the development and use of smartphone applications related to micromobility, and financing subscriptions for shared mobility services. Metropolitan regions also prepared regulations on digital platforms and mobility applications, in order to achieve greater transparency and quality of service, and of course sanitary measures related to the use of shared transport (disinfection, cleaning, use of mask…).

The main impacts observed by metropolitan regions on the use of shared vehicles were on micromobility: increased use of e-scooters, shared bicycles, motorcycles, etc. in relation to numbers before the pandemic, and with regard to car and van sharing, the obligation to clean and disinfect the vehicle. The impacts were different between companies and regions, there were companies with great success, others had to adapt or create new services (e.g. transport goods instead of passengers) and some companies stop operating all together due to bankruptcy or change of operation. The recuperation of this sector is foreseen with several disruptions.

The COVID-19 pandemic has had an enormous impact on the number of users but recuperation has been better than transport authorities had expected.

According to the inventory, better cooperation between stakeholders (transport authorities, transport operators (public and private), municipalities, central state, etc.) was necessary for a quick and effective response to the pandemic situation. In addition, data collection and constant monitoring were of crucial importance for continuous adaptation to the unforeseen reality and challenges in the field of public transport. Partners also referred to the public transport subsidies, the necessity of State funding, and investments in public information services (both digital and traditional channels).

The pandemic situation has boosted the digitalisation of transport, particularly in fields like ticketing, information and monitoring systems. In the field of ticketing system during and after the pandemic crisis, metropolitan regions established or improved E-tickets, integrated ticket systems, mobile ticket systems, increased mobile sales by development of smartphone applications for the purchase of tickets, and integrated applications: passenger information systems, route planning and ticket systems, flexible tickets, open ticket interface for different operators and cross-border ticket system (Tallinn, Tartu, Helsinki).

6.3 Good practices

6.3.1 Klinko - on-demand transport service (Ljubljana Urban Region)

During the pandemic Ljubljana presented the on-demand transport service with an electric vehicle (Klinko), which was performed as a

Picture: Joana da Silva

Picture: Joana da Silva

living laboratory in the area of the University Medical Centre and Institute of Oncology in Ljubljana. The pilot project was presented within the EU project Tribute which aims to address challenges posed by the rapid diffusion of new technologies and by occurring socioeconomic and demographic changes, by seeking solutions and mobility services that are tailored to the behaviours and needs of citizens.

6.3.2 Collective shuttle rides (GoOpti) (Ljubljana Urban Region)

Another good example was shown within the implementation of collective shuttle rides (GoOpti) from the peri-urban area to the industrial parks in Ljubljana. It enabled workers employed at the same companies to be driven to their place of work while public transport was not operating in Slovenia (regional test rides have a chance of being promoted nationally).

6.3.3 Sopotniki - free ride for elders (Ljubljana Urban Region)

The "Sopotniki" service increased regionally. The service is free for elders in a vehicle that is owned and paid for by less densely populated municipalities in the region. The service is available by prior reservation and intended for use by elders and physically impaired persons.

6.3.4 Gothenburg Green City Zone (Gothenburg region)

Currently in development, the Gothenburg Green City Zone is a world first: an initiative by a number of major stakeholders including Volvo Cars to build a climate-neutral transportation system in the large geographical area of Gothenburg. New technology will be tested to allow this part of Gothenburg to have 100% emission-free transport modes by 2030.

The zone can be likened to a vast testbed and demonstration area where companies, social stakeholders, academia and institutions can collaborate on testing new technologies and scaling up their operations, products and services in transportation, infrastructure, energy and other areas related to the environment.

The goal is for all vehicles travelling in or from the Gothenburg Green City Zone to run with zero emissions by 2030, in a functioning infrastructure that enables climate-neutral transportation choices and facilitates everyday life for businesses as well as residents and visitors, in an attractive urban environment.

6.3.5 The ElectriCity Platform (Gothenburg Region)

The ElectriCity platform is a collaboration to test how to create the conditions for sustainable urban transport in Gothenburg. It is not due to the pandemic but is a good example of how research and businesses can collaborate with society to develop and test new solutions for electrified transport.

6.3.6 Shared Neighbourhood cars (Helsinki Region)

The city of Espoo and private shared car service providers have tested a shared neighbourhood car business model in four pilot areas in Espoo. The cars are stationed in housing areas and returned to the same area. Citizens have been happy with the service which has continued after the pilot phase. The city of Espoo has appointed some car parking spaces for shared cars only and enabled more flexible parking for shared cars in some parking areas. The shared car parking is marked on the city-level (and region) service map. All normally paid car parking areas provided by the city are free of cost and without time limits for shared cars.

6.3.7 Traffic reduction measures (Budapest)

Traffic reduction measures have been introduced in Budapest during the pandemic in order to compensate for the negative effects of the modal split in the city. In the large central urban area, the traffic was rearranged by changing some one-way streets, restricting driving in some sections and limiting street parking in order to eliminate through traffic in narrow streets. Public transport was excepted from the restrictions in order to keep the quality of inner-city lines. This has been fine-tuned since then, but kept. As a future plan, if acceptance of the traffic reduction measures allows it, the street layout may be changed in order to create more space for pedestrians, bicycles, micromobility points and terraces.

6.3.8 MaaS service (Metropolitan city of capital Rome)

On the 28th of February 2022, Rome was nominated as the lead city together with Milan and Naples for the development of the project of Mobility as a Service for Italy (MaaS for Italy). About 2.5 million euros have been allocated to this project as part of Measure 1.4.6 of the National Recovery and Resilience Plan (NRRP) aimed at fostering the development of innovative mobility services and intelligent transport management through data sharing.

As a lead city, Rome will act as a laboratory to test MaaS services. Moreover, the funding will support public transport operators in the digitisation of systems and services.

The aims of Maas for Italy are:

- Increase transport accessibility and passenger experience (perceived quality);
- Qualify and enhance the public transport system;
- Modal rebalancing, oriented towards decreased use of private cars;
- Consolidate sharing habits;
- Reduce energy consumption;
- Reduce the climate-changing effects of mobility and contribution to decarbonisation;
- Reduce the consumption of urban space for mobility and parking;
- Increase digital intensity in the mobility domain;
- Increase productivity of passenger transport (number of passengers moved per unit of service);
- Social sustainability and cohesion (reduce travel time, increase accessibility, reduce social and territorial inequalities, support the inclusion of vulnerable travellers).

With the Resolution of the Capital City of Rome No. 113 of 7 April 2022, ATAC (public transport operator of Rome) is designed as MaaS Operator (i.e. ATAC has to cooperate with all the stakeholders and other transport operators involved and connect them with passengers), while Roma Servizi per la Mobilità (Rome Mobility Agency) as MaaS Integrator (i.e. Roma Servizi per la Mobilità provides the infrastructures and support for

the collaboration of all the transport operators involved).

The MaaS system will be implemented gradually (Operational Plan of the City of Rome, 2021): the first steps describe the development of an Urban Mobility Application (UrMApp), an extension of shared micromobility services to zones that are not covered by current operators and integration with Public Transport services. Then, integration with other transport modes is forecast, along with the integration of digital payment, all to be completed by the end of 2022.

6.3.9 Porto.card (Porto metropolitan area)

The Porto Card was conceived by the local authorities of Porto, in order to meet the specific needs of visitors who want to be efficient about their stay in Porto.

It includes a variety of free attractions and discounts on over 170 different activities. In addition to the discounts and locations you can visit at no extra cost, the Porto.card covers the cost of public transportation for as long as your pass is valid.

6.3.10 Transport digitisation: occupancy of trains (Barcelona metropolitan area)

The AMB metro operator, Transports Metropolitans de Barcelona (TMB), has begun to display the occupancy of trains arriving at three stations on line 5 of the metro, thanks to new screens located on the platforms which in turn receive information from the load sensors installed on trains. This is a pilot test of a practical application of transport digitisation for the benefit of passengers.

The screens receive information from the load sensors installed on trains. Thanks to the system, passengers know the actual position of the next train and the degree of occupancy of each carriage, on a scale of 1 to 4. In this way, passengers will be able to distribute themselves on the platform in order to occupy empty carriages of the subway, or wait for the next train.

The pilot test is being carried out at three stations on the L5 line because this is precisely the line with all the sensorised trains and greatest demand. All three stations have a medium-high influx of passengers.

6.4 Workshop results

On the 23rd of May, partners and stakeholders met via Zoom to exchange know-how on the responses given by public transport management in the post-COVID-19 context. To introduce the theme Paulo Humanes from CEIIA shared his experience of mobility operations in the post-COVID-19 world, followed by Jorge Barbeiro and António Matos (AMP) who addressed the theme of data collaboration and relevant experience of the Metropolitan Area of Porto. After that, Carmo Tovar (AMP) presented the main conclusion of the inventory answered by all the partner regions. At the end, participants were divided in two groups to work on two themes: Data collaboration and other subjects related with the sharing economy.

6.4.1 Mobility operations in a post-COVID-19 world

Before the pandemic crisis cities were on a good path to a more sustainable mobility. They were focused on electric and zero emissions vehicles, several successful investments in shared mobility and more attention with regards to public transport, with cheaper and personalised intermodal ticketing systems. Then suddenly the pandemic hit and from one day to the next we were forced to be isolated at home. That completely changed urban mobility. We saw empty streets and empty public transport, and it was a big challenge to know how to deal with that.

We have the infrastructure, we have some big data, not all of it relevant to our needs, and in a scenery that shifted from day to night without any artificial intelligence to deal with the complexity. Cities struggled due to a lack of walking data, bicycling data, occupancy data and other relevant data that they needed to approach the situation.

But on the other end, the lockdown period was very good for urban logistics. With empty streets and everybody at home, the ef-

Picture: Joana da Silva

ficiency was never so good. Another success story, but not for all operators, was the provision of service on demand, individual mobility as a service, that allows one to travel from A to B in a controlled environment. The capacity of public transport authorities to adapt to the new situation, with a very big drop in the number of passengers in public transport, changing routes to better satisfy the needs of people, creating new services and, most of all, working in close collaboration with the transport operators to develop solutions for the new reality.

Now, we see that people want the things to be the way they were before the pandemic. So, if we really want to think about the cities of the future, the cities that we will live in 10 years from now, we have to work with young people. Understand what they want and involve them in the construction of a more resilient and sustainable urban transport infrastructure.

Picture: Joana da Silva

6.4.2 Data collaboration

Centralised information management models are difficult to maintain due to scalability problems and the integration of new players. In data collaboration and distributed governance models, each entity produces and cares only for their individual level of information. If necessary, an entity makes use of and delivers information outside of its scope by referencing (no need to import information). Integrators can explore information and create new uses, even brand-new services.

The core of the data collaboration model lies in each producer's responsibility to build consumer trust in data.

We already have a common language to share information (Netex and SIRI), but we still need:

- a common data certification model;
- a common security model;
- a common responsibility model.

6.4.3 The AMP view

As far as management of public transport is concerned, real-time public transport vehicle data (supply data) and ticketing system data (demand data) are relevant to network/route planning, estimated time of arrival, scenario analysis and modelling, operation monitoring and control. The control will allow an evaluation of the quality of the service and the possibility to allocate bonuses and penalties to the operator. The data should be open to other users, to allow other entities to use and create value from it.

The main future challenges and possibilities for the Porto Transport Authority in the post-COVID-19 world are the following:

- Improve efficiency in the network;
- MaaS (Mobility-as-a-service) and integration of micromobility;
- Keep open data reliable;
- Multimodal data share;
- Predictable and accessible information for passengers;
- Congestion management;
- Reduce environmental impacts;
- Use of artificial intelligence algorithms.

6.5 Policy recommendations

Based on the work carried out by the SMART-MR partners, stakeholders and specialists settled on the following key points:

- Micro-mobility had a boost in post-COVID-19 time. The transport authorities and municipalities should have an important role in the promotion and regulation of micromobility. Micro and shared mobility should be included in the intermodal ticketing system.
- Accessible, precise, and concise information is crucial to the promotion of intermodal mobility.
- The public transport system has multiple organisations, each with autonomous management. Data collaboration is necessary to gain full and timely control over the system.
- Centralised information management models are difficult to maintain due to scalability problems and the integration of new players. In data collaboration and distributed models of governance, each entity produces and cares only for their level of information. If necessary, an entity makes use of and delivers information outside of its scope by referencing (no need to import information). Integrators can exploit information and create new uses, even brand-new services.
- The core of the data collaboration model lies in each producer's responsibility to build consumer trust in data.
- We already have a common language to share information (The European standards Netex and SIRI), but we still need: a common data certification model; a common security model and a common responsibility model.
- Different types of data exchange (local, metropolitan, regional) are needed for different subjects and objects (traffic delays, road circulation conditions, bus stop conditions, parking availability, etc.) that can be accomplished only through data collaboration and data responsibility among different agents. Protocols such as Netex and SIRI play a significant role in facilitating such collaborations.
- In the field of mobility services, there is room for a common European electronic payment system.

Carmo Tovar and António Matos

e-WORKSHOP 7:
Integrating COVID-19 experiences into (regional) mobility plans

7.1 Introduction

Due to the COVID-19 pandemic, mobility habits and behaviours have changed drastically. Thus, it is important to assess the impact of these changes in terms of planning goals, as well as evaluating if mobility planning is able to deal with possible new targets and policies.

The seventh SMART-MR e-workshop "Integrating COVID-19 experiences into (regional) mobility plans" discussed the impact of the COVID-19 pandemic on the current planning experience, underlining reinforced and weakened planning goals, new goals, the planning approaches to be adopted in case of deep uncertainty, the role of new data sources and tools for mobility planning. It was organised on 22 June 2022 in blended mode: face-to-face in the conference room of the Department of Engineering of Roma Tre University and simultaneously, on the Microsoft Teams platform for those connected remotely.

The workshop started with the introduction of representatives from the Metropolitan City of Capital Rome; the local organising committee welcome session followed. From the beginning, key topics emerged about the roles of Mobility as a Service (MaaS), data fusion and integration for monitoring and planning, new approaches for transport network planning and design, accessibility and equity for rural areas.

The workshop which followed proposed three keynote speeches: i) "Planning mobility demand during the COVID-19 pandemic, the importance of data monitoring and advanced modelling"; ii) "Walking and Cycling cities, how the micromobility revolution impacts mobility planning" and iii) "The sustainable urban mobility plan of the Metropolitan City of Rome. Planning during the uncertainty of COVID-19". The keynote speeches were led by transport planning researchers (Prof. M. Petrelli and Prof. M. Nigro) and by Doct. Elena Colli, Travel Behaviour & Communication account of GO-Mobility (the company in charge of the development of the Sustainable Urban Mobility Plan of the Metropolitan Region of Rome).

After the keynote speeches, the inventory results collecting the main observations of the partners on workshop topic related questions were presented; a discussion followed on the future perspectives of data, modelling tools and planning approaches, as well as on new planning goals for regional mobility. The discussion was moderated by international experts in the field (Prof. G. Cantelmo and Doct. Fabio D'Andreagiovanni), followed by concluding remarks.

Figure 7.1: Workshop participants in the Department of Engineering of Roma Tre University. Picture: Andrea Gemma.

7.2 Inventory results

The inventory results have been summarised analysing the answers of partners on five main questions concerning the impact of COVID-19 related legislation on mobility planning, reinforced or weakened planning goals, new goals, data, approaches and planning models adopted during the pandemic.

7.2.1 Policy document or legislation related to the COVID-19 emergency modifying mobility planning

In general, a direct link between policy documents or legislation related to the COVID-19 emergency and mobility planning does not appear. Several COVID-19 related legislations and policies impacted mobility behaviours (e.g. Smart Working/Flexible Working; EU COVID certificate; incentives to buy soft modes of transport, such as bicycles, e-scooters, etc.), thus an impact in terms of travel demand, regional land use and housing is expected, and requires to be included in both short- and long-term horizon mobility planning.

Gothenburg underlined that these impacts can be dealt with by updating targets, since the larger goals are mainly unchanged. Other partners emphasised how the results of the SMART-MR project could be included in SUMP under development (Rome) or adapting an existing SUMP (Ljubljana).

7.2.2 Planning goals reinforced or weakened by the effects of COVID-19: New goals

It is a common viewpoint that the main goals remain unchanged; these are public transport competitiveness and environmental protection. However, partners recognised that COVID-19 reinforced the need to rethink the urban space, promoting walking and bicycling, working on a station-based concept, transit-oriented developments and 15-minute cities.

Linked to the previous goals, an increasing role of micromobility and e-micromobility emerged both as a single mode option and in combination with public transport (multimodality). Finally, the increasing need for last-mile logistics solutions is a reinforced goal that requires giving higher priority to freight transport in regional planning instruments.

7.2.3 Approaches to choose measures to contrast COVID-19: forecasting method (what if), backcasting approach (what to), hybrid version

Most of the partners declared that backcasting approaches have been adopted (Ljubljana, Gothenburg, Budapest, Barcelona, Porto), while what if thinking has been adopted by Helsinki and a simulation-based approach in Rome. In both cases, data to be measured and monitoring indicators are essential to understanding where the system is going, and consequently to the adaptation of strategies.

In a context of increasing uncertainty or, more correctly, with "deep uncertainty", as in the case of the pandemic event, the common

vision is to move towards hybrid approaches mixing what if and what to methods.

7.2.4 Data and model planning tools

About the model planning tools adopted for mobility planning, the answers of the partners were not uniform. Firstly, there are differences in the spatial dimension of the existing traffic models: Ljubljana and Gothenburg cited the existence of national-scale models, while the other partners cited a most appropriate metropolitan region model. About the type of modelling approach, Ljubljana and Rome stated the adoption of classical 4-steps models. About the capability to deal with multimodal transport models, it has been reported for only three partners (Ljubljana, Budapest, Rome); thus, it is not clear if all the models are multimodal or not, while being multimodal is essential to correctly deal with sustainable policies promoting modal shift toward public transport.

A general lack of model calibration to consider the pandemic was emphasised by all partners. Calibration calls for data acquisition; most of the data collected during the pandemic in order to deal with planning models are related to validations at subway stations and ticketing data (Rome, Porto), traffic flow from control cameras and a mobility survey (Barcelona), but also new data sources such as Bluetooth and floating car data (Rome).

Finally, about tools, PTV Visum was adopted by Budapest and Porto (in the case of Porto only as a trial, since there is a lack of human resources and know-how in transport modelling); GIS-based solutions are usually preferred (Barcelona and Porto).

7.2.5 Good/bad practices: impact of COVID-19 on current planning experience

Again, partners emphasised that new aspects need to be considered and reinforced: local mobility, walking and bicycling, city logistics. Good practices during the pandemic have been reported by Rome: 1) the recovery of the role of the Mobility Manager for promoting sustainable mobility solutions in both companies and local authorities; 2) the promotion of micro-logistic hubs. Instead, Porto emphasised greater collaboration between Government and local authorities. All the partners agreed on the need to consider uncertainty in future planning approaches.

7.3 Workshop results

Starting from the results of the three keynote speeches, briefly summarised in the boxes below, good practices resulted in terms of data and modelling calibration, approaches and techniques to deal with new goals for regional planning, as well as in terms of public engagement.

Then, based on the results of the inventory and the good practices presented, workshop participants were involved in a live discussion. The results are presented as follows:

7.3.1 Discussion results about future perspectives of data, modelling tools and planning approaches

Planning models are the pillar of sustainable mobility, but it is difficult to have a model able to represent uncertainty, resilience, changes in mobility habits, etc. It is quite a common opinion that models have not changed yet to deal with the COVID-19 pandemic experiences and that their spatial dimension (at least for models generally adopted at regional level) cannot actually include new goals, such as for example micromobility related aspects. Uncertainty could be covered using models able to compare the current scenario with a very large set of possible resilient scenarios. Uncertainty requires the planning of flexibility, but planning for flexibility requires financial flexibility which is not trivial.

Big data and new sources of information are becoming fundamental to the calibration and validation of models as well as in policies and planning measures to monitor processes, thus there is a need to realise data repositories (“data lakes”) and data fusion processes to exploit information. Based on collected data, it is possible to compute key performance indicators. Data and telematics can help to forecast reactions and changes in mobility.

7.3.2 Discussion results about new planning goals for regional mobility

After the pandemic lockdown, users experienced the recovery of travel frequency but less recovery of the activity space, indicating more short-distance travel rather than long-distance travel. This calls for the topic of integrating transport planning with land use into an urban form that is able to guarantee liveability. The participants agreed that urban sprawl is not the key to improve quality of life, despite COVID-19 pushing people to move outside of the city centre. The aim is now to integrate “15 minute cities” with station-based concepts, thus connecting transit-oriented developments into an integrated public transport network.

Land use means also density, since for example sharing mobility is successful in high density areas; moreover, high density in the surroundings of main stations can increase active modes. Active lifestyles have the potential to incorporate physical activity into daily life, which clearly leads to health gains. Moreover, these also reduce traffic congestion, noise and air pollution, and lead to transport cost savings, fostering more compact, cohesive, and liveable communities.

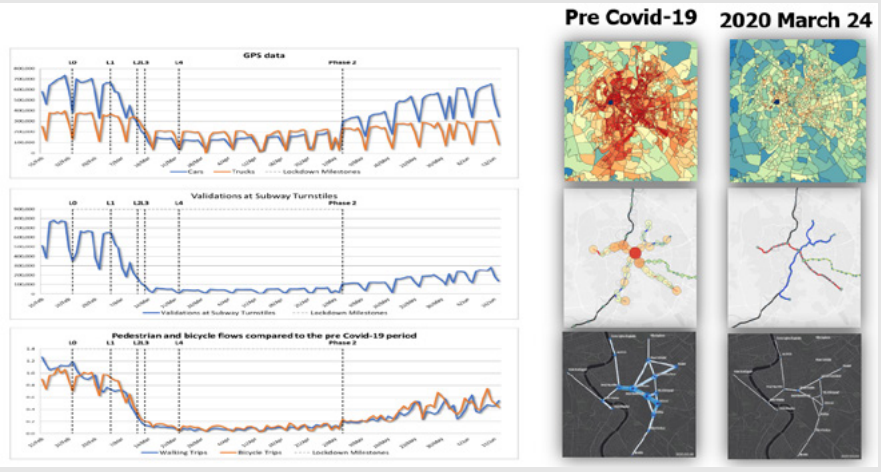


Figure 7.2: Monitoring phase for model calibration in Rome.

Keynote 1: Planning mobility demand during the COVID-19 pandemic, the importance of data monitoring and advanced modelling tools

The first keynote speech addressed the development of a transport forecasting simulation model made in collaboration between the three Universities of Rome and the Mobility Agency of the city; the existing static four steps model of the Mobility Agency has been calibrated in order to deal with the COVID-19 pandemic and enriched with new variables (economic activity types; share of teleworkers). The results are forecast occupancy levels for each section of the metro network, thus forecasting possible oversaturation and allowing for better management of the system.

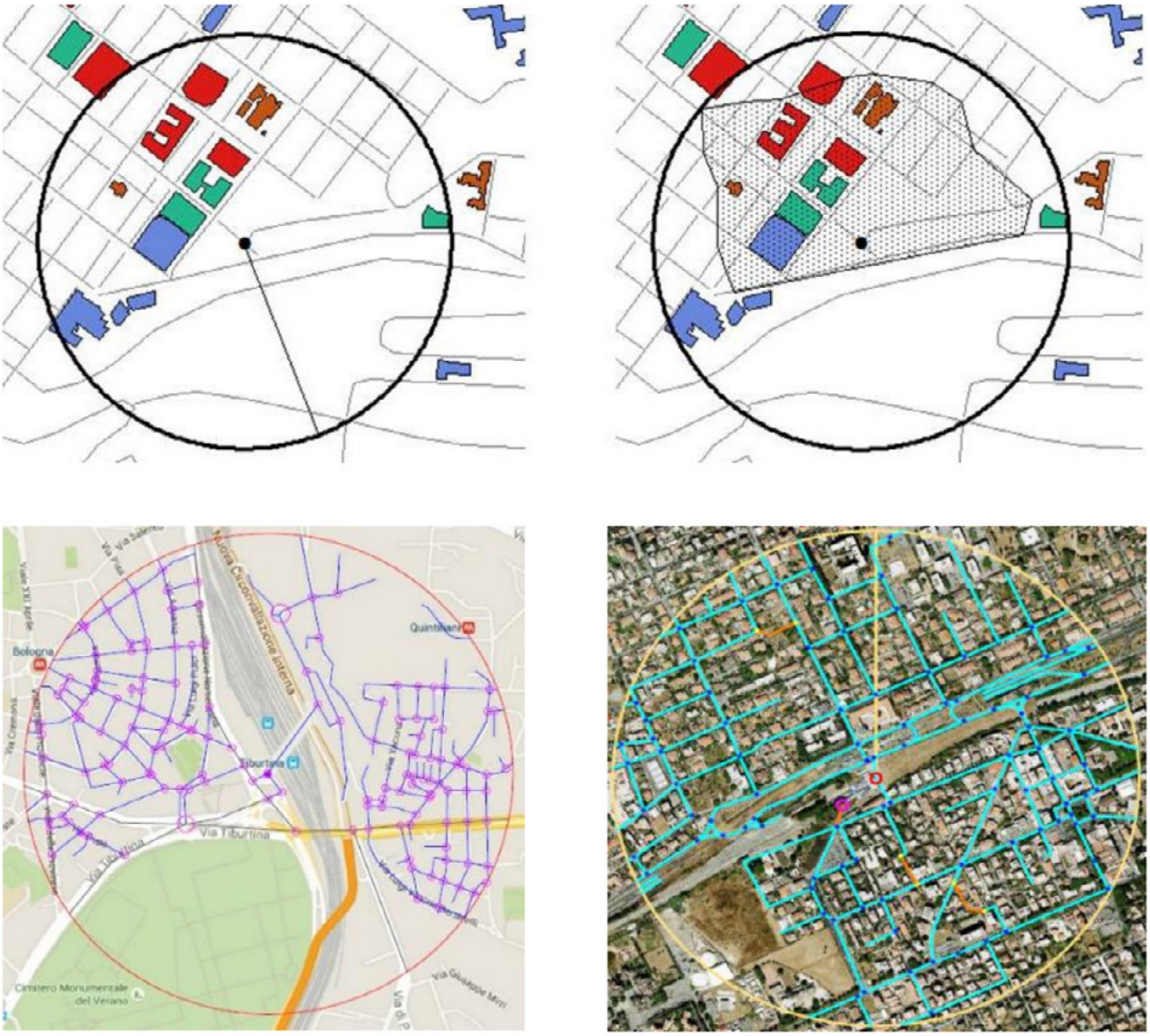
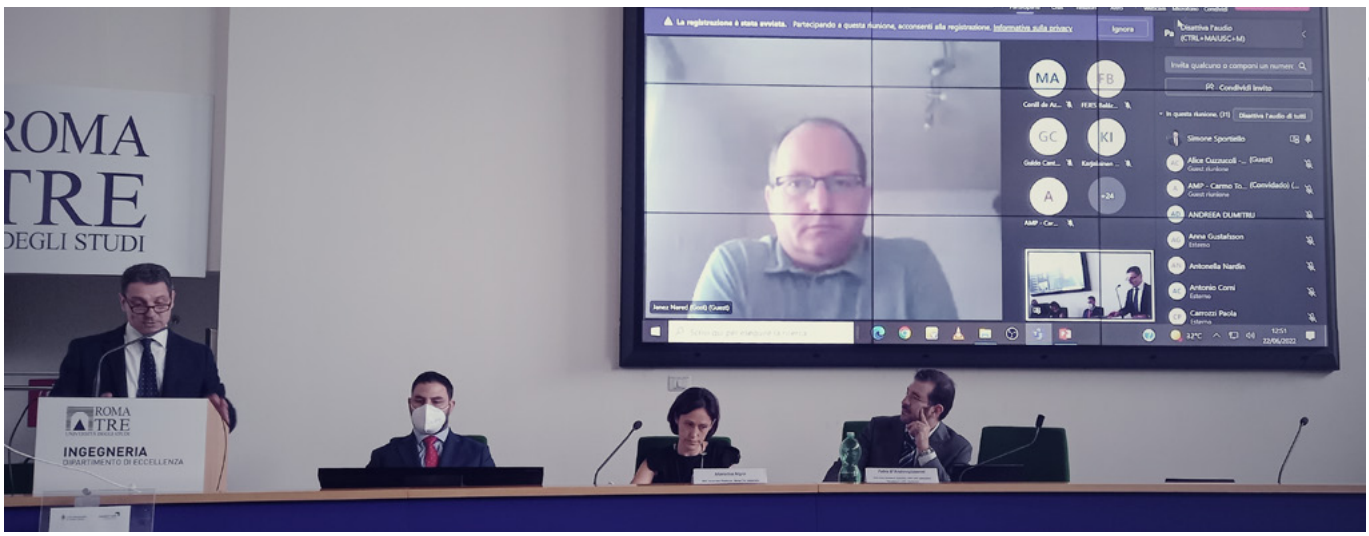


Figure 7.3: Micromobility Oriented Developments.

Keynote 2: Walking and Bicycling cities, how the micromobility revolution impacts mobility planning

The second keynote speech addressed the micromobility revolution, i.e. the rise of walking, bicycling and, generally, the adoption of micromobility vehicles during the pandemic in Italian cities (for both short and medium length trips as a single mode option or as a multimodal solution). Approaches and techniques to lead the rise of micromobility working on walkable environments, land-use, transit station locations, safety and bicycle network connections have been proposed that can be adopted in the planning phase.



Picture: Andrea Gemma.

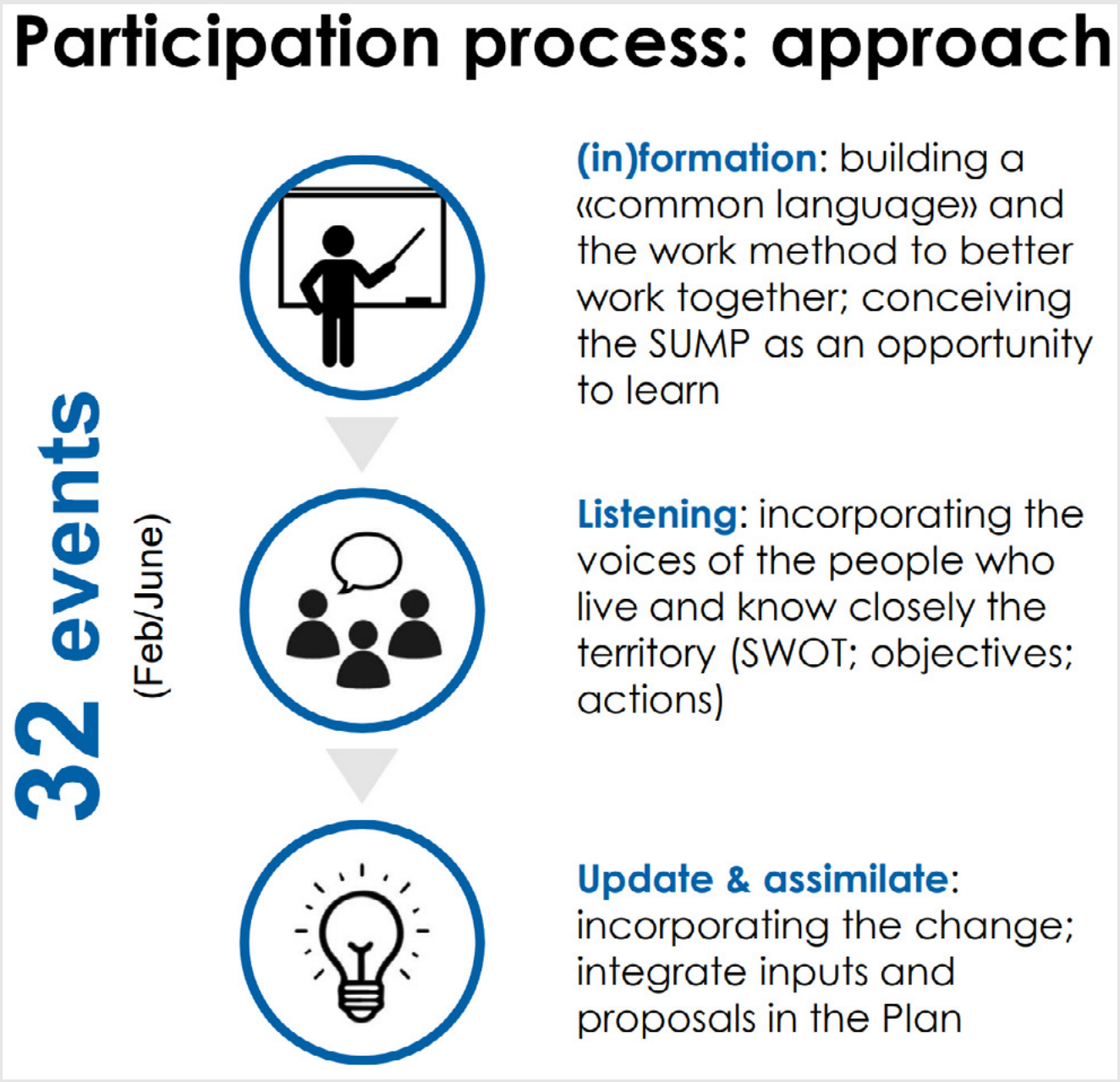


Figure 7.3: The participation of stakeholders in the SUMP of MCCR.

Keynote 3: Sustainable Urban Mobility Plan of the Metropolitan City of Rome. Planning during the uncertainty of COVID-19

The third keynote speech addressed the current development of the Sustainable Urban Mobility Plan (SUMP) of the Metropolitan City of Capital Rome. Special attention was required in the starting phase during the collection of data and public engagement. About data, census data, surveys (Stated Preferences surveys included), traffic counts, floating car data and mobile network data allowed to obtain the starting information about travel demand. About public engagement, 400 stakeholders have been involved, highlighting the targets and weaknesses to be addressed by SUMP.

7.4 Policy recommendations

Several key-points and related policy recommendations have been highlighted from the speeches, inventory results and working groups, and have been presented in the conclusions of the workshop:

- **the importance of accurately monitoring both transport demand and supply:** nowadays technology allows the collection and integration of data from different sources, in order to extrapolate enriched information and to use this data as an input for models to forecast and monitor the effectiveness of actions and solutions;
- **public transport has to recover the role of a backbone for sustainable transport planning, especially for regional and urban contexts.** New transport modes (e.g. micromobility), mobility services and telematics can change the way travellers adopt public transport, i.e. introducing multimodality through the MaaS paradigm;
- **uncertainty due to the COVID-19 pandemic created a "new normal" condition:** new habits, such as telework and e-commerce, have been accelerated by the pandemic, and have consolidated such that it is required to include them in modelling and planning;
- **participation and public engagement are basic conditions for planning;**
- **to correctly evaluate the effects of disruptive events, models and tools must be improved and integrated in order to facilitate monitoring the current scenario and the impacts of possible solutions.**

Marialisa Nigro, Rosita De Vincentis, Andreea Dumitru

8 Final workshop:
COVID-19-related processes and responses in metropolitan regions

Picture: Janez Nared

On 13 and 14 September, the final workshop of the SMART-MR project 'COVID-19-related processes and responses in metropolitan regions' took place in the city of Barcelona, at the offices of the Barcelona Metropolitan Area (AMB).

The workshop started with three technical site visits. The first was a visit to the Sant Antoni superblock in Barcelona. The Superblock programme is moving forward and is becoming the street transformation model for the entire city of Barcelona, intending to reclaim for citizens' part of the space currently occupied by private vehicles. The second site visit was a bike ride along the Besòs river walk. Following the renaturalization of the River Besòs, streets and promenades around it have been transformed as green spaces for sport and leisure. The bike ride ended at Badalona train station with a visit to the Badalona park-and-ride e-bicibox. This facility, close to the train station, with 92 bicycle parking spaces, similar to those already in operation in Gavà and Sant Joan Despí, promotes and facilitates the use of the bicycle as daily transport.

The following day, the workshop started with the institutional welcome from Carles Conill, AMB Sustainable Mobility Services Director and a welcome, overview and conclusions of SMART-MR by Petra Rus, project manager at the Anton Melik Geographical Institute on behalf of Janez Nared, Research Centre of the Slovenian Academy of Sciences and Arts, SMART-MR Lead Partner.

After that, Carolyn Daher, a specialist in public health from the Barcelona Institute for Global Health, explained, as part of her work on how urban design can affect the health of the population, how mobility and public space are an opportunity for health. According to her, the determinants of health are not only related to doctors and medicine. They are also related to the physical environment. COVID-19 showed us how urban planning could give access to those natural areas discovered during the pandemic. Designers, architects, and urban and transport planners have a critical opportunity to protect and promote health. Green spaces reduce air and noise pollution and heat, critical factors for healthy cities.

The workshop continued with a presentation of actions and responses that the eight metropolitan areas of the project have implemented during the COVID-19 pandemic. They shared what they learned from the pandemic in making better and more resilient cities and regions. The onset of the pandemic forced us to take urgent, unprecedented and radical measures in a very short time.

After the keynote speach and presentation of partner experiences, the workshop continued in the form of two roundtables:

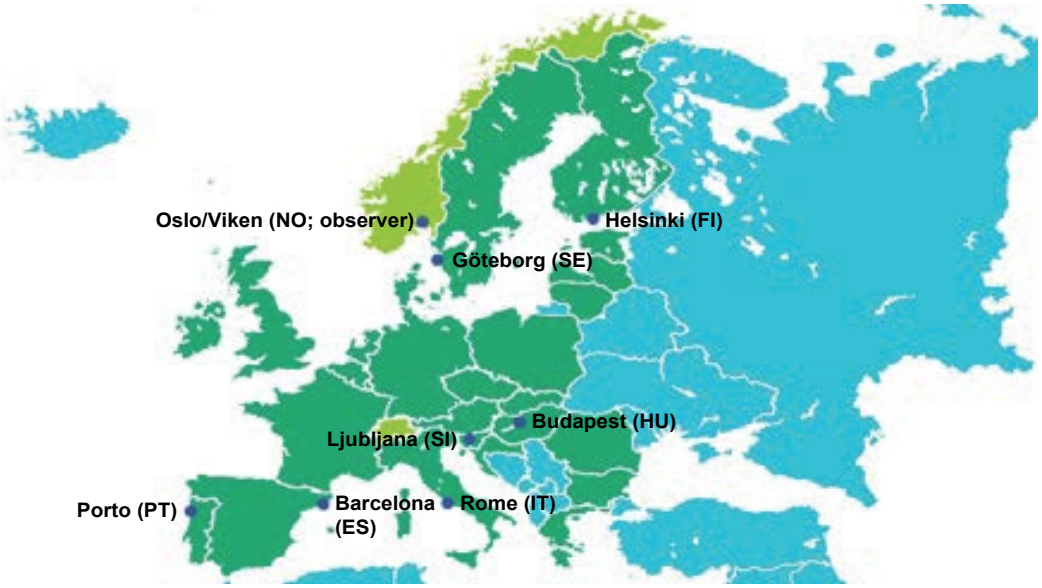
What has COVID-19 taught us in the field of mobility?

The discussion started off talking about what lessons we have learned from the pandemic. All participants agreed that if there is a political will, there is implementation. In addition, data demonstrated that the main pollutant factor is cars. Discussion followed, exchanging opinions about how society has changed its mobility pattern. We are returning to pre-COVID-19 levels. The new consciousness requires an improved system to consolidate behaviour patterns. There is also a lack of memory because two years after the pandemic we have forgotten most of it and, should it come back, we would have to think about everything again. The last question discussed was on which lessons learned from the pandemic can serve in facing the current energy crisis. On that point, the pandemic showed us the importance of active transport modes, which could help to reduce energy consumption. Also, no solutions will work, if we don't make people part of the process.

What has COVID-19 taught us in the field of spatial planning?

The last roundtable was divided into two topics. The first one was on how the COVID-19 pandemic has demonstrated that dense cities and metropolises with short distances by public transport and active mobility especially to public facilities (health facilities in particular) and open spaces but also to work and leisure seem to be more resilience, and, in the end, better places to live and work. The second was about how COVID-19 and climate emergency are forcing us to change the way we move and, as planners, we need to allocate the right infrastructure to foster this change. Both discussions finished with the following conclusions. Listening to people's needs and following the long-term vision will help us to get a great and resilient metropolis. Involving people to understand their needs will help to get a shared diagnosis, a shared proposal and finally a shared responsibility. The micro making of places is a useful tool to involve citizens and taking responsibility for it. Knowing the matter that is already there will let us to get bigger and better results by connecting experiences and knowledge. The tools are there and we only need the stories and their images to unlock possibilities.

Jordi Jové Palou



Metropolitan region	Partner
Ljubljana	Research Centre of the Slovenian Academy of Sciences and Arts
	Regional Development Agency of Ljubljana Urban Region
Oslo/Viken	City of Oslo, The Agency of Urban Environment - observer
	Viken County Council - observer
Gothenburg	Göteborg Region Association of Local Authorities
Helsinki	Helsinki Region Environmental Services Authority
Budapest	BKK Centre for Budapest Transport
Rome	Metropolitan City of Capital Rome
Porto	Porto Metropolitan Area
Barcelona	Barcelona Metropolitan Area

Interreg Europe project SMART-MR (Sustainable measures for achieving resilient transportation in metropolitan regions) supports local and regional authorities in eight European metropolitan regions to improve mobility policies. It also aims to provide sustainable measures for achieving resilient low-carbon transportation and mobility in metropolitan regions of Barcelona, Budapest, Göteborg, Helsinki, Ljubljana, Oslo/Viken, Porto and Rome. Project will be running from April 2016 until March 2023 and coordinated by Anton Melik Geographical Institute of the Research Centre of the Slovenian Academy of Sciences and Arts and funded by European Regional Development Fund.

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