

JOURNAL
PROJECT

VoxPop - People, Processes & Technology towards the digital transformation of the urban mobility system of Lisbon

📍 Lisbon, Portugal

TOPIC

Digital transition

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The Vox Pop Project Journal No 3

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The Vox Pop Project - Journal No 3

People, Processes & Technology towards the digital transformation of the urban mobility system of Lisbon (VoxPop) is the project that will foster digitalization and collaboration between private and public mobility actors in the Portuguese capital. VoxPop is funded by the Urban Innovative Actions (UIA) initiative under the Digital transition topic.

VoxPop - People, Processes & Technology towards the digital transformation of the urban mobility system of Lisbon

VoxPop was created to facilitate the digital transformation of the mobility system of Lisbon, aiming at mobilising the various stakeholders of the local innovation ecosystem to collectively provide a response to a set of non-technological challenges of digital innovation in urban mobility.

The ambition is to accelerate the digital transition of the Lisbon's mobility system by developing a data-sharing model where multi-party data are translated into actionable intelligence to enable the creation of enhanced user-centred mobility solutions, and unlock more efficient methods of planning, operating and maintaining transport assets.

The project motivation was the need identified by local actors to improve collaboration by sharing data and thus unlocking efficiency in the asset management of the mobility sector of the Portuguese capital. The focus is on the non-technological challenges, including governance, business models, user focus and unwanted consequences of digital innovation.

Through a process of change based on the three main vectors of digital transformation: People, Processes and Technology, the project was designed to ensure the active participation of citizens, the people who will benefit from the solutions developed.

The project is led by the Lisbon City Council with the support of various public and private actors of the mobility eco-system of the city, among them civil society, from which active citizen participation is expected. It is aligned with the vision and priorities of the Municipality and it is composed of the following innovations that will become a key structure for managing mobility in Lisbon:

- An Innovators Alliance, a forum to foster dialogue between the mobility actors of the city, aimed at creating sustainable and responsible public and private data-sharing ecosystem with a focus on how to overcome the existing non-

technological barriers to urban mobility data-sharing, and ensure both public and private entities generate value from these data.

- The Urban Access Point has been replaced by the new and enhanced Open Data Portal for EMEL, which facilitates access to open data and open-source tools as well as to the visualization of maps and graphics while it allows to share “closed” data to validated profiles. An Open Call aimed at mobilizing the European innovation community, allocating 1 million euros to the development of 18 digital solutions for improving accessibility and security of the most vulnerable city users.
- Definition of the functional requirements of the navigation support tool for vulnerable city users, in particular, people with reduced mobility.
- Definition of the functional requirements of the client-observer app that will facilitate the provision of feedback from users about the Public Transport system of the city.
- Urban mobility observatory of Lisbon, to facilitate the access of external entities to information concerning urban mobility measures and support the impact evaluation of the project.

Additional outputs have been developed during the project execution following the mobility needs of the city and the citizens:

- Asset management tool by EMEL able to convert automatically CAD drawings to GIS files conserving all attributes. It has been applied to cycle paths and will be extended to sidewalks in the future.
- Deloitte tool for assessing micromobility regulation in terms of access, parking and speed limit.
- Enclosed parking facilities for bicycles in Lisbon (13 in total).
- Pricing strategy for car parks based on rotation and offer packages.
- A new mobility application integrating two existing apps (parking and bike-sharing) and other EMEL services, scalable to other stakeholders in the future.

Partnership

The partners of the project include the Lisbon City Council (project leader), EMEL, CARRIS, the Metropolitano de Lisboa and Transportes Metropolitanos de Lisboa. This consortium also has the participation of three companies for key project activities: ARMIS, Beta-i and Deloitte Portugal.

The Lisbon City Council (CML) led the VoxPop Project. In addition to ensuring that the project is aligned with the vision and current priorities for the city, CML led the activities of the Data Sharing Business Model and by the Observatory of Urban Mobility in Lisbon, which will become a key structure for measuring the impacts of the project.

The EMEL (Lisbon Municipal Mobility and Parking Company's) mission is the development, management, and operation of urban mobility solutions, integrated in Lisbon's global mobility and accessibility system. As the operational arm of CML for urban mobility, EMEL has a very active role in the implementation of the project. It will be responsible for the operational management of the project, sharing the responsibility for communication activities with CML. EMEL also led several activities in the Data Sharing and Urban Data Integration Business Model.

CARRIS is a key player of the urban mobility ecosystem in Lisbon, being the main surface Public Transport Operator in the city. As an operator, CARRIS has access to a set of relevant data and a vast experience in being part of different organisations that share databases and information. It was responsible for leading the Urban Data Integration.

Metropolitano de Lisboa (ML) is a public company responsible for the metro system in the Lisbon area and is one of the main players in the city's urban mobility ecosystem. Its participation in the project involved contributing to the reflections on the data sharing model and business models. ML also participated in the development activities of new and improved mobility services complementary to its current offer.

Transportes Metropolitanos de Lisboa (TML) is the entity responsible for the management of the technological platform that integrates the ticketing system and public information and for the development of studies, plans and implementation of accessibility, mobility and transport policies of the 18 municipalities that integrate the metropolitan area of Lisbon. It is also the entity responsible for the management of AML's public road transport service. It was a key-player in the discussion around the data-sharing model including roles and business models.

ARMIS is a technology-based company focused on providing IT services in a wide range of areas, including transport and ITS. It supported in the enhancement of the EMEL Open Data portal, promoting and facilitating the access to open data and open source tools.

Beta-i is a collaborative innovation consultancy with a global reach. It will lead the work of the Open Call, contributing with its experience in open innovation programmes. In particular, Beta-i mobilized a group of NGOs to identify the main challenges to be solved and will accompany the development of the solutions selected, and for seeking ways to promote their transferability to wider markets.

Deloitte Portugal is a leading global provider of audit & assurance, consulting, financial advisory, risk advisory, tax

and related services. Deloitte Portugal coordinates the Smart City Solutions Center, a centre that brings together diverse expertise in the areas of Smart Cities and Future of Mobility globally. Deloitte Portugal was responsible for the development of a regulation and control tool, which supports the municipality of Lisbon and the micro mobility operators in the use of public space.

Highlights

This is the third edition of the VoxPop journal and aims at providing an updated overview of the faced challenges during the execution of the whole project. It also includes the follow up actions based on the challenges identified by the VoxPop project.

Between March 2023 and August 2023, the project partners have concluded the implementation of the project activities, delivering digital tools and solutions for the city of Lisbon to improve the quality of life of their citizens and paving the way for follow up actions to consolidate and improve these changes.

The VoxPop project partnership has finalized most of the planned activities, overcoming all the issues faced during the project execution. More concretely, during the project period the partners have managed to achieve the following:

Innovators Alliance - IA

Rules for sharing data between the public partners of the consortium were drafted, ending up in 13 city challenges that can be solved using data.

Open call for European Innovators

The 18 selected companies deployed mobility tools in the city and wider area, covering all the challenges set up for the Open Call.

Lisbon Urban Mobility Observatory – LUMO

The Observatory is ready and composed of aggregate data and mobility indicators and it feeds the observatory of the city of Lisboa with mobility indicators.

Urban access point – UAP > EMEL upgraded open data portal

In the previous period, the user needs and system requirements had been collected, but the lack of a data sharing model didn't allow for the finalization of the technical requirements. Therefore, the consortium decided to upgrade the EMEL open data portal, adding on the one side open source visualization tools and on the other side the capability of sharing private data sets to validated users.

Promotional and dissemination activities

- The project website <https://www.voxpoplisboa.pt/>.
- The open data portal www.zzz.pt
- The public observatory <https://observatorios-lisboa.pt/en/>
- The project partners have successfully submitted and presented scientific papers to POLIS Annual Conference 2022 – Bélgica, Bruxelas and 10º Congresso Rodoferroviário Português – Lisboa, Portugal.

Successfully handling key challenges

Vox Pop managed well the foreseen (and unforeseen) challenges. Details are provided in the respective section of this journal.

VoxPop: expectations and challenges

In the first journal the expectations from the consortium members participating in the project were collected. In the second journal these expectations were discussed with the partners in order to assess at what degree these are being met by the project outputs. In this third journal, the fulfilment of the partners expectations right after the end of the project were assessed.

Initial expectations from the consortium members

Significant improvement of accessibility for people with reduced mobility aiming at a higher quality of life.

Needs of people with disabilities should be defined and analyzed towards higher accessibility (e.g. indicating which are the accessible vehicles) and security (reporting tools to alert about potential dangerous points).

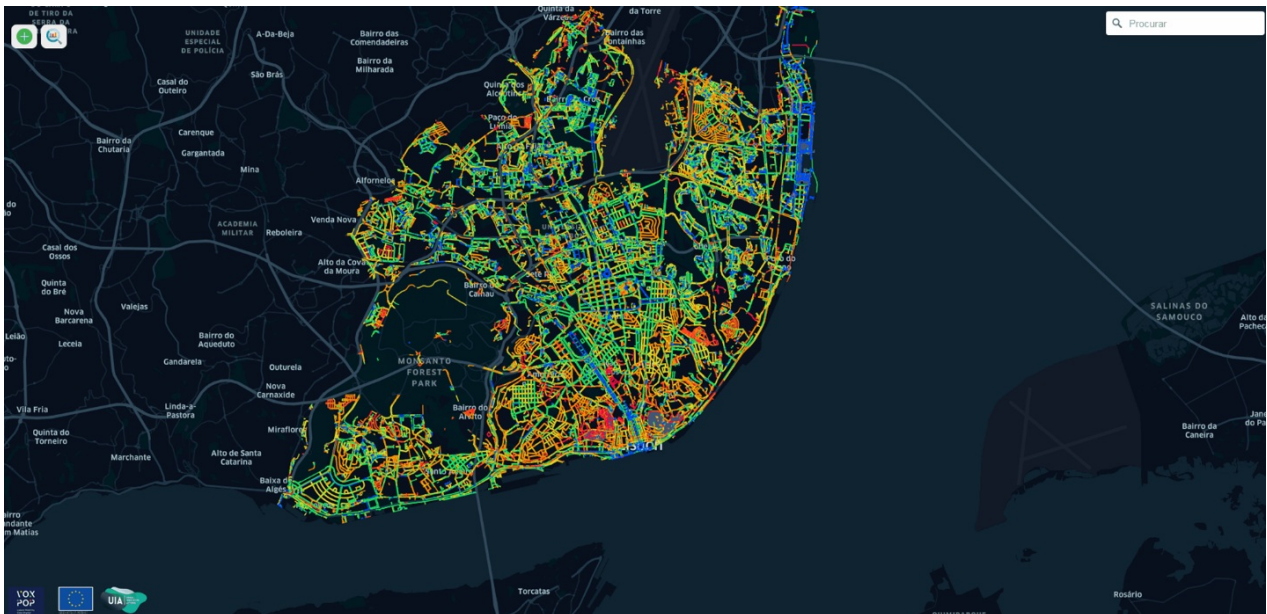
Update: Often in Lisbon, shared mobility vehicles are poorly parked, cluttering sidewalks and pedestrian areas, thus creating unsafe environments for people with reduced mobility, such as people in wheelchair and visually impaired. A smoother and ordered operation of e-scooters and e-bikes in the city is needed. Deloitte is helping Lisbon municipality on the design of a regulation model and tool for shared mobility management, more specifically e-scooters and e-bikes. With this new regulation model and management tool, among other things Lisbon Municipality will be able enforce e-scooter parking and act on poorly parked vehicles, ensuring a proper and efficient management of shared mobility, which is key for improving accessibility for people with reduced mobility.

CARRIS operates an on-call DRT-type service for people with wheelchairs and has a strong interest on improving the service for people with disabilities. With regards to innovative mobility services, CARRIS is currently establishing a DRT service, as part of a pilot project with CEF funding, which may be extended to lines with suitable characteristics (e.g. night services). For this purpose, data from the other mobility service providers should be utilized.

Additionally, this challenge is included in the ones identified by the Innovators Alliance. Challenge 3: Mapping accessibility for persons with reduced mobility (PRM) of journeys on public transport.

Finally, it is also supported by the Open Call by 1 out of 4 of the selected proposals.

End of the project update: The project delivered an important output, a mapping tool presenting the side walk's gross width which covers the entire city.



Other main improvements in the mobility landscape for the city of Lisbon

First, improve the mobility of those that live, work, study and visit the city of Lisbon, including school mobility and having special focus on the inclusive mobility of vulnerable people (dedicated routing and improvement of conditions).

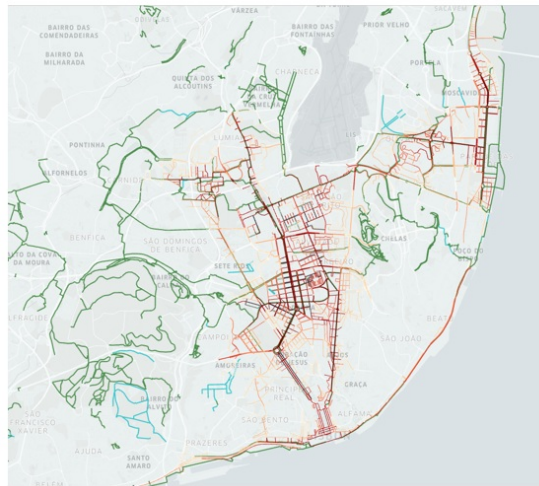
Update: CARRIS designed a tool for supporting mobility of people with reduced mobility (people in wheelchair and visually impaired). The tool is currently in procurement and it will include features considered to be of priority for users in the co-design processes implemented, including for example alerts for blind people about which station to get off the bus and an assessment of the presence of a shelter in bus stops.

Second, reduce the use of private cars in the city, increase of the share of bikes and expansion of the bicycle network, reduction of the number of road accidents towards zero deaths and regenerating public spaces, not only in Lisbon but also in the other municipalities.

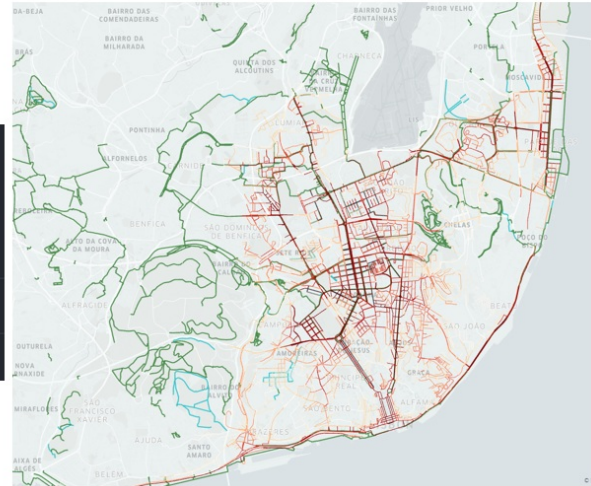
Update: This was the original goal of the project and it remains the same. Several challenges were identified and data was made available to demonstrate how this expectation can be met. It is also supported by the Open Call by 1 out of 5 of the selected proposals.

End of the project update: The tool for supporting mobility of people with reduced mobility was finally not developed, only commercial requirements are available. However, the upgraded open data portal of EMEL empowers everyone (citizens and visitors) with real-time information about pedestrian and cycling infrastructure, traffic and parking (on- street and off-street) status as well as electric vehicle charging stations location.

Rotas GIRA



Rotas Micromobilidade (Extrapolation)

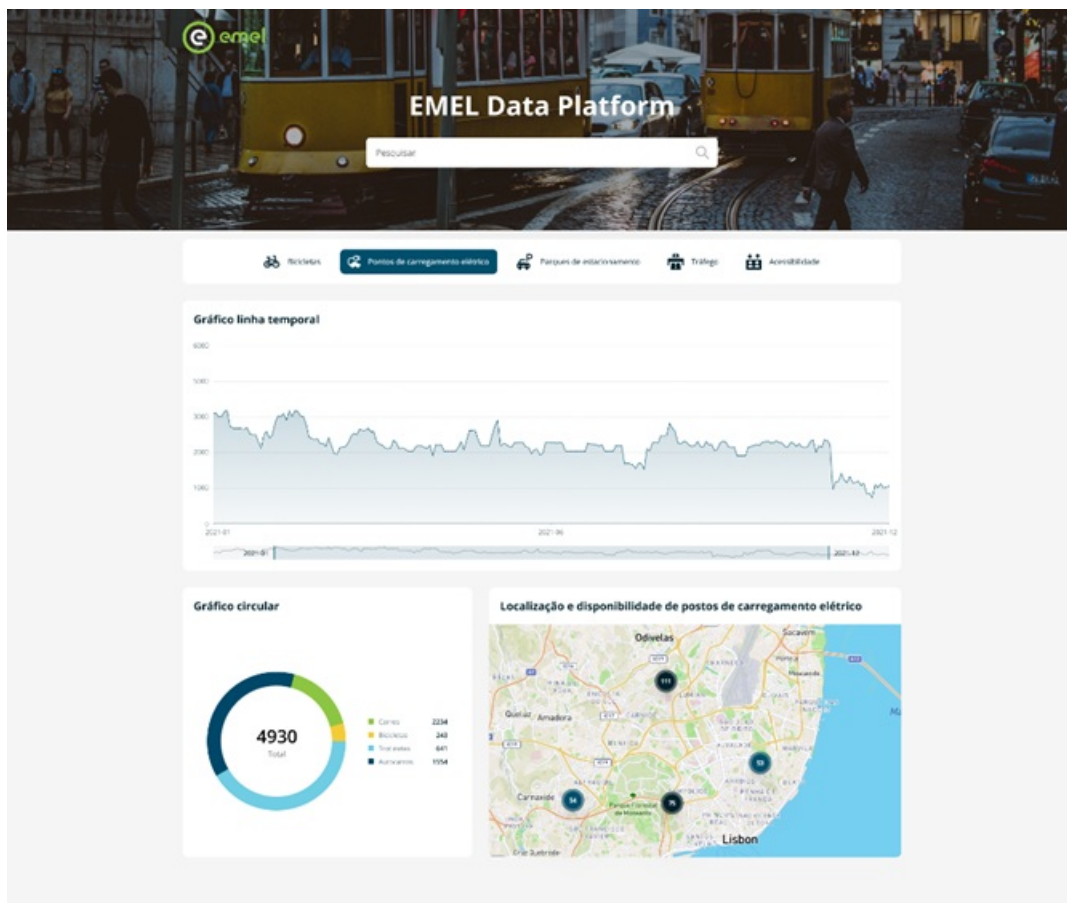


Creation of an eco-system able to share dormant, scattered, and silo-ed operational data.

Integrated information from both public and private transport service providers should be available and the establishment of links with the other members of the eco-system facilitated. Local operators already collect data related to safety or to the performance of the systems aiming to work with the city to improve the conditions when the data depicts conflictive areas or operation problems. Moreover, collaborations with local police and the local parking company to solve operation problems due to incidents are already established. However, these still rely in human operators and are therefore not as efficient as if they would be if they were relying on automatic communication channels between the involved actors, facilitating the information flow.

Update: There need for data sharing for real-time management and long-term mobility planning have been recognized, however this issue will remain as one of the challenges to overcome after the end of the project. There is a clear maturity gap between public and private stakeholders regarding digital innovation conversations while at the same time there is an important mismatch of public and private interest in sharing data. Thus, the data supporting the identified challenges was limited to the one provided by the public authorities. However, the creation of the Urban Access Point will create a trusted environment for entities to exchange information based on bilateral agreements supported by a local platform for data sharing. Additionally, with the new regulation model and management tool, micromobility operators will share operational data with the municipality.

End of the project update: The Urban Access Point was not finally created due to the lack of a shared data model, but it was replaced by the upgraded EMEL open data portal, in which also private data sets can be available to verified and trusted users.



To put a seed that will grow to a better data collection infrastructure in Lisbon and to a better dialogue and collaboration between all the actors of the mobility eco-system.

Transform corporate data into strategic assets to improve the quality of life of our fellow citizens, providing them a services that meet their expectations and needs". These strategic assets should also improve the efficiency of business processes, encourage problem solving and support management in the planning- and the decision-making process. At the end VoxPop should create a culture of "co-evolution" because data and its uses, will continue to evolve. This means that the skills needed to collect, categorize, assess, and act on data will need to evolve, too.

In the same direction as in the above expectation, the fact that only data provided by public authorities were used illustrate the difficulty to engage the private sector. However, the Innovators Alliance was founded, and it is the seed for a better dialogue between all the actors of the mobility eco-system. Moreover, the collaboration of the public partners allowed to solve common problems of all partners in order to enable a mobility eco-system. More specifically, the conversations and collaboration with micromobility operators will serve as an example for future dialogues among Lisbon Municipality and other transport operators. Also, such collaboration can be mimicked by other areas and operators, e.g. energy, water, waste management operators.

It is also supported by the Open Call by 1 out of 6 of the selected proposals.

End of the project update: Collaboration has been achieved between public institutions, and also with the participation of one private entity, thus this expectations has been fulfilled, to a lower extent than expected but still achieving data sharing with an international private transport operator.

Standardize data generated by the actors of the mobility ecosystem of Lisbon following European standards.

Data standardization and communication protocols such as DATEXII should be promoted, in line with other international, national and local relevant projects such as C-Roads, C-Streets, IDACS, DATA4PT, UVARBox, EU-EIP and of course the implementation of the Portuguese NAP (National Access Point). Especially relevant to VoxPop is the NetEx standard, which is conceived for multimodal public transport data.

The expectations are still high, but many difficulties are foreseen to get the Urban Access Point.

End of the project update: even if the Urban Access point was not finally developed, all datasets from EMEL and CARRIS available in the open data portal were harmonized according to DATEX II and NeTEx. Some gaps were identified in the standrads (which are still evolving) and were communicated to the DATEX community.

New challenges identified

Mobility challenges in Lisbon

A total of 13 mobility challenges were identified by the Innovators Alliance.

- Challenge 1: Increase the commercial velocity of buses
- Challenge 2: Making dissuasive parking more appealing
- Challenge 3: Mapping accessibility for persons with reduced mobility (PRM) of journeys on public transport
- Challenge 4: Increase the attractiveness of public transport compared to private car use
- Challenge 5: Prioritize sustainable modes at intersections with higher conflict/competition of flows
- Challenge 6: Increasing the experience of using sustainable modes
- Challenge 7: Improving the cycling network
- Challenge 8: Impact assessment of the introduction of a new bicycle lane in the city
- Challenge 9: Public transport alternatives more suitable for the demand of Lisbon Schools students
- Challenge 10: Creation of mobility hubs for better accessibility to Lisbon neighbourhoods
- Challenge 11: Identify cycle parking needs in the city
- Challenge 12: Prevent the effects of one-off events and natural phenomena that generate higher (and disruptive) demand
- Challenge 13: Factors influencing the use of sustainable modes

End of the project update: Many of the above challenges were met by sharing data and jointly analyzing it to improve the mobility infrastructure in the city.

Reluctancy in sharing data by private entities and other barriers in sharing data

Important barriers to data sharing were identified, such as the additional costs needed to process the data (human and/or technological), the lack of reciprocity or proportionality in sharing data, potential legal implications and risk of sharing data with economic value. Additionally, various public entities had difficulty in sharing ticketing data due to the GDPR. Different formats are investigated to share it while complying with the laws.

End of the project update: There is a lack of maturity, mostly from the public operators regarding sharing data topics, especially in sharing valuable data with private organisations.

Challenges towards digitalization identified at the proposal stage

- Dormant, scattered, and isolated operational data;
- Inefficient public space management;
- Lack of systematic approaches, and processes that are poorly integrated into day-to-day life to enable future use;
- Users of public transport, and vulnerable users of the mobility system in general, have no voice;
- Regulatory blind spots that allow the uncontrolled entry of innovators;
- Service providers, especially large companies, promoting the use of intrusive solutions with unclear data use policies.
- Identifying a sustainable business model to exploit the potential of mobility data in Lisbon.

The above challenges were partially tackled by the 18 solutions that have been selected in the open call and the digital tools that are being developed within the project. The latest includes, among others, the navigation tool for VRUs and the tool to regulate public space use by shared mobility providers as well as the generation of actionable information supported by people-centered qualitative research to ensure that the real needs, preferences and expectations of the citizens are met.

End of the project update: The 18 solutions mostly contributed to the first and fourth challenges by facilitating the exchange of data and giving voice to users of public transport respectively.

Launch and management of the open call, collection of specific requirements

The open call was delayed due to the difficulties in drafting its content under pandemic conditions. However, these delays were minimized thanks to the execution of on-line workshops. Additionally, the open call was planned to be based on open-source, reducing the interest of participants, but this issue was overcome by not limiting the call to solutions based on data (data-driven) but also data generators, i.e. Digital solutions, that could be platforms, apps, or others.

With regards to the collection of requirements for the client-observer app, the difficulties were related to the recruitment of the right participants but also to the change in mobility habits due to the pandemic.

End of the project update: the open call was successfully launched and received more than 100 proposals, ending in selecting the best 18 of them and supporting these companies in developing/improving their solutions, hosting a public demo at the end of the project.


Key challenges

This is how the key implementation challenges tracker is illustrated for the period since the start of the project to the time of writing of this journal.

Challenge

Observation

Leadership for implementation: aversion to risk by administrations


Challenge level 

Political commitment has been ensured at high level. Indeed, the project already created expectations to be fulfilled, therefore priority to its implementation will be given by the public side. At the same time, it is a strategic project for the participating entities (including the private ones), so it is placed high on their agendas. This challenge is expected to remain low during the whole duration of the project.

Update: in 2021 there was a political change in the Municipality and the project priority was downgraded.

End of the project update: The political change hindered the project execution, generating delays due to the lack of strong political commitment. An example is the cancellation of the mobility identity output. Also, there was less support to the IA in engaging the public partners to share data.

Public procurement: prepare the right tender and attract the right providers to achieve expected results and ensure local benefits

Challenge level 

No large procurement is foreseen in the project, only external expertise and services. Still, the project has planned cascade funding for an open call, which may be challenging to implement from the administrative side. In addition, other problems related to the IT equipment might appear, such as difficulties arising from regulations or from low interoperability between the open framework and the legacy IT systems. All these issues will be taken into account when designing the tenders, so they do not hinder the project implementation.

Update: Although the tendering process was long, there were no difficulties in its execution.

End of the project update: No issues with that, only services were purchased.

Integrated cross-departmental work: "silo" organisational culture

Challenge level 

The project fits the strategy of the city and has the support of the different departments potentially involved from the Lisbon Municipality side and the other participating entities. On the other hand, mobilisation of internal resources has been taking longer than initially envisaged which led to significant delays in the start of the activities. Indeed, the establishment of the governance of the project was identified as high risk and it appeared, creating a delay in the start of the project. Today this issue has been mostly solved.

Update: This issue was even further improved during the project implementation.

End of the project update: Following the political changes, the priorities in the departments were less aligned with VoxPop.

Participative approach:
how to co-create and
keep participants
motivated?

Challenge level ●

The project has been conceived to be participatory by design. Co-creation and co-implementation are foreseen. Still, attraction of the citizens' attention and ensuring their long-term engagement can be challenging. In order to ensure the participation of citizens, NGOs and citizens' associations will be also involved in the identification and design of the challenges.

Update: Although the project was executed partly during the COVID pandemic, the participants in the co-creation events were well motivated and there were high levels of participation in interviews and co-creation sessions (e.g. for the challenges of the open call).

End of the project update: the project was successful in this aspect, with a total of 4.000 people participating in co-creation activities.

Monitoring &
Evaluation: how to
achieve a deep
understanding of the
impact achieved?

Challenge level ●

Monitoring and assessing the results of the project will be challenging, especially the indirect ones. The number of data sets shared or services enriched by the project can be easily measured, but the final impact in the mobility experience of the Lisbon citizens will be more difficult to quantify. It will be critical to be able to demonstrate the added value of the data sharing ecosystem, and the magnitude of its results in the local context. Causality of the impacts and activities will be quite challenging to determine. Moreover, the establishment of the baseline will be even harder to determine due to COVID effects. An activity dealing with the Monitoring & Evaluation of the project results has been foreseen to plan in advance how these issues will be tackled.

Update: After the definition of the monitoring and evaluation framework there was a clearer picture of the challenges and how to assess the results of the project.

End of the project update: The results of the project were easy to measure, but the wider impact was difficult to track, with a lack of evidence in short time.

Communication: how
to establish a two-way
inclusive and honest
communication
process


Challenge level ●

Citizens will be involved in the design and implementation phases, so the selection of the right communication channel to reach them will be crucial. In this direction, Beta-i will be the responsible for the communication to the startups / innovators, and they have an extensive experience in communicating and engaging with these types of stakeholders. Communication to citizens's associations and NGOs might be the more challenging, and it will be driven by the Municipality. A communication plan has been drafted to ensure proper interaction between the project partners and the citizens.

Update: The first approach didn't worked well, but since Oct 2022 the communication agency is working with the project partners and there is a good overall communication. All publicity campaigns and material were created with them, including public sessions live on social networks and the live transmission of events (e.g. open call launch).

End of the project update: the project was successful in this aspect, gaining significant traction with the execution of the co-creation activities.

Upscaling: how to scale solutions in space and time


Challenge level 

It will be challenging to keep the momentum generated by the project in such a multi-party effort, especially after the end of the project. In addition, there will be the need to generate a mechanism to maintain, update and enlarge the project outputs, for which sustainability should be ensured. This is not trivial since due to transparency and openness of public tenders, solutions with similar specifications but with a better value for money will be selected, not ensuring interoperability or continuity. All the way around, having pilots should not be a binding process to a concrete provider for the later scale up. These two issues should be well balanced. In this direction the project is building an engaging “general” value proposition for the innovators, but the scaling up will need to be addressed in a case by case scenario depending on the specificities of each developed solution.

Update: Due to the delay in the project execution, not fully functional tools but pilots with a limited scale will be executed. The same for the open call.

End of the project update: The delays did not allow to disseminate and escalate outputs. Additionally, not all tools were functional, while no real impact assessment from the open call was executed to identify scalability opportunities to other regions.

Others

Challenge level 

Engage and keep the commitment of the private sector; avoid unintended consequences; create trust; ensure privacy and security; unlock data silos; ensure data quality; define use cases and ensure financial sustainability of the data sharing ecosystem.

Update: All these issues are of high importance to VoxPop and are being tackled in the relevant work packages.

- The level of maturity and data sharing interest of private partners was low so most of the datasets were closed and limited to project partners being public entities.
- A data sharing governance needs to be defined.
- Different quality levels on the available data, including the limitation to processed data in some cases (no raw data).
- Use cases defined but not yet including financial sustainability.

End of the project update:

- Technical and organizational alignment is needed between public and private stakeholders.
- Open-source principles are key for digital solutions developments.
- New ways of working are needed, more people centered.
- Results and outputs should be communicated.
- Quick wins should be included to demonstrate capabilities.

More time should be dedicated to the preparation of the proposal.

VoxPop follow up activities

VoxPop created seeds for various follow up activities. The first ones to be implemented are the following:

- Mapping the width of the sidewalks was done a part of the project. As a follow up action, obstacles and the accessibility of people with reduced mobility to EMEL services will be added. Additionally, this data will be part of the data shared through the European Mobility Data Spaces (EMDS).
- A strategy to align mobility policy of the city with EMEL offer (i.e. pricing of car parks) will be established as follow up of the new strategy for the parking lots / car parks.
- CARRIS will finalize the VRU app for people with reduced mobility and the users' feedback collection app.
- The city will move forward with a corporate MaaS to reduce use of private car.
- An index to support evaluation of commercial speed of buses will be calculated and added to the city platforms.
- The development of the EMEL app integration its portfolio of services will continue within the C-streets initiative.

Digital transition

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