



SHARING DATA for SHARED MICROMOBILITY

SURVEY REPORT
JANUARY 2021

POLIS
CITIES AND REGIONS FOR TRANSPORT INNOVATION

Executive Summary

Shared micromobility services generate high volumes of data, which can help local authorities in planning, managing, and improving the infrastructure on which these services rely.

Policies and practices to share these data vary from place to place, and practical questions abound: who shares what, in which format, for what purpose? Do organizations have the capacity to deal with, and benefit from, data sharing? How can the whole process be made more efficient for all?

This exploratory survey was conducted to advance POLIS' ongoing work on three critical issues: data sharing needs and use cases, data specifications and formats, and application to other modes beyond micromobility. 125 respondents participated (almost half of which from local and regional public authorities), providing a practical portrait of current sharing practices, applications, challenges, and preferences for the future.

Responses indicate there is a capacity gap between the public and private sector, that poses problems to both sides, and may harm the growth and consolidation of shared micromobility, as well as its contribution to the public interest, and that generally needs to be addressed to make progress towards more data-driven and evidence-based decision-making.



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Advancing together.

POLIS is the leading network of European cities and regions committed to transport innovation – more specifically, to innovations that can make urban mobility more sustainable, safe, and equitable.

Three characteristics set us apart from other networks.

First, *we focus on **transport***. This enables us to cover, connect and understand the full spectrum of changes coming to urban mobility, and the challenges and opportunities they bring.

Second, *our members are committed to **policy-responsive innovation***. They are looking for improvements and solutions, and they want to engage with the future. Nobody joins POLIS to simply manage the *status quo*.

Finally, *we have a **holistic approach***. We know that the social and economic life of urban areas, and their built environment and transport systems, are shaped by distinct entities and interests. We are not an 'echo chamber' for local government, quite the contrary: we actively reach out to key stakeholders, and seek solutions through constructive dialogue.

These three principles guided our approach to Shared Micromobility since it arrived on our streets, bringing with it a golden opportunity to accelerate the shift to sustainable urban mobility, but also negative externalities that require mitigation and resulting challenges for governance and integration.

One issue emerged very quickly: data sharing.



Is it important? What data are needed, and what for? How can we make it happen, and how can we make it easier, overcoming obstacles and inefficiencies?

If you want to know, ask.

Well, that's what we did through this survey, reaching out to our growing network of members and stakeholders. To all, thank you! Let's learn and advance together.

Karen Vancluysen

Secretary General, POLIS



1. Introduction

Shared micromobility services are available in many cities and regions throughout Europe and well beyond, providing vehicles for (usually) short trips inside urban areas.

Most of these services are using bicycles (with or without electric power), e-scooters (also called standing electric scooters or kick-scooters), and a growing diversity of other small devices. These vehicles can be found in fixed stations, or “free-floating” in public spaces (i.e., not fixed to specific locations).

Digital technologies and geolocation play a central role in these services, and their operation generates high volumes of data, about the number, spatial distribution, and status of these vehicles, but also about who is using them, to travel where, and when. Collection and analysis of these data enable several insights, but may also generate privacy risks.

For transport professionals, who grew up on a “poor data diet” made up of partial traffic counts and outdated travel surveys, the access to data from shared micromobility services looks like a golden opportunity. These data can be useful for various transport-related activities, from planning to management, research, and enforcement.

But practical questions abound. How are the data to be shared? By whom, and with whom? On what basis? For what purpose? In which format? What about commercial confidentiality and personal privacy? And what about the additional workload this implies for both sides? Is there available staff with the proper skills and expertise? And how can we make the whole process more efficient for all involved?

Data sharing practices vary from place to place, as does the capacity of public authorities to deal with them. Knowing those practices and understanding the needs and preferences of public authorities and private operators will help us address common challenges, for the benefit of all.



2. Objectives

The opportunities and challenges posed by shared micromobility services to local and regional authorities have been the focus of the POLIS Working Group for Governance & Integration for the past couple of years and were extensively discussed in the POLIS paper “*Macromanaging Micromobility – taking the long view on short trips*”, published at the end of 2019¹.

It soon became evident that there is a diversity of approaches, in terms of public governance and private business practices, but nevertheless some common challenges, one of them being data sharing and the practical issues it poses.

To feed an ongoing structured dialogue involving several actors from the public and private sectors, and to foster convergence on issues where it would be feasible and worthy to do so, POLIS decided to survey current practices and opinions in different organisations (public and private) about the sharing of data generated by shared micromobility services.

The **main objective of this survey** is to support decision making by POLIS, by local and regional authorities, and by private operators, on how to best advance on the issues of (1) use cases, (2) data specifications (3) and application to other modes.

For this purpose, the following **research questions** were set:

- How are digital datasets being shared?
- What are the main challenges raised by data sharing?
- What are public authorities using shared data for?
- What are the expectations regarding higher-level outcomes?
- How can public and private players make data sharing easier?
- What is the potential utility of sharing data from other transport services?

¹ Available online (cf. Reference section at the end of this Report).



3. Methodology

This survey was conducted by the POLIS Network, on its own initiative, to follow up and build on insights gained throughout almost two years of work in its Working Group for Governance & Integration, with the participation of local and regional authorities, as well as shared micromobility operators, third party data aggregators and transport consultants and experts.

The survey was conducted **online**, using Google software. The questionnaire was made available for a period of two full weeks, from 10 October to 24 October 2020².

The survey was disseminated through several online channels, including the POLIS website (news section³) and its social media profiles on LinkedIn⁴ and Twitter⁵, the “*INFOPOLIS*” digital newsletter⁶, e-mails to several POLIS mailing lists⁷ and targeted contacts for further dissemination through additional networks and partners.

Several follow-up contacts were made with public and private organisations known to conduct activities in this domain, namely local and regional authorities with shared micromobility services operating in their territorial jurisdiction, shared micromobility operators, and third-party data aggregators.

In total, 125 completed questionnaires were received. This is an **exploratory survey** made with a convenience sample, which naturally does not allow for statistically valid extrapolations for the full universe of all local and regional authorities, all shared

² A period of fourteen consecutive days, started at 0h00 (CEST) of Saturday 10th October 2020, and ended at 0h00 (CEST) of Saturday 24th October.

³ <https://www.polisnetwork.eu/news-events/news/>

⁴ <https://www.linkedin.com/company/polis-network/>

⁵ <https://twitter.com/POLISnetwork>

⁶ Sent to the full POLIS emailing list, including members and non-members

⁷ Including the listings of the Working Groups for Governance & Integration, and for Active Travel & Health.



micromobility operators, and all third-party data aggregators, in Europe and beyond.

The questionnaire (cf. appendix A) comprised a total of 40 questions, but because of its skip pattern no respondent was presented with more than 27 questions.

A set of 6 screener questions were employed to control access to a set of 7 consecutive questions about the sharing of digital datasets with raw data, in order to ensure that those questions were answered only by respondents that are actually dealing with the sharing of digital datasets with raw data.

This survey seeks to inquire about the practices and needs of public and private organisations. One must be mindful, however, that organisations are not monolithic, quite the contrary – they are ‘made up’ of different people, with diverse levels of power, tasks, expertise, expectations, and perceptions. This ‘inner diversity’ is especially relevant for those inquiring about the topics addressed by this survey, since these topics are quite new to the life of many organisations (namely on the public side), and practices (as well as accompanying perceptions and opinions) are still emerging.

Because of this, it would be very difficult to collect the ‘official’ positions from surveyed organisations, especially when they are large, public, and faced with new and detailed questions – and asking for them wouldn’t necessarily elicit more reliable or useful responses. With this in mind, the survey was designed to also explicitly welcome replies from experienced individuals. In order to encourage the response by individuals, and to simultaneously ensure transparency regarding the capacity in which the answers were being provided, respondents were asked to indicate (on the first survey question) if they were answering the survey *“as an individual”* (thus assuming *“my answers reflect my personal experience and opinions”*), or *“as an organisation”* (thus assuming *“my answers represent my organisation’s experience and positions”*).



For the reason stated above, and for the purposes of this survey, the responses to these questions are not considered of high relevance – nevertheless, the reader may be interested in knowing that 55 respondents indicated they would be answering the survey *“as an individual”*, 68 *“as an organization”* and 2 opted for a mixed reply. From the 25 respondents from the public sector that answered the set of questions on sharing of digital data sets, only 4 indicated that they were answering the survey *“as an individual”*, and from the 8 respondents from private operators that answered the equivalent questions on the sharing of digital datasets, only 1 indicated the same.

In subsequent questions, respondents were asked to indicate their type of organisation and its name, and, in the case of local and regional (public) authorities, their country and the designation of the territory under their jurisdiction. This enabled us to check (in the analysis phase) for overlapping respondents. There were a few cases (six) of more than one response from the same organisation – however, none of those cases affect the seven consecutive questions on the sharing of digital datasets with raw data – the 25 respondents who reached those questions were from distinct public authorities. The overlap, thus, is for questions asking opinions and expectations, and it was decided to keep the questions.

In the data treatment phase, data were checked and corrected for 3 questions asked with an open box where respondents had to type in the answer: name of organisation (all respondents), and country and designation of territory under jurisdiction (local and regional authorities). Changes made were limited to correcting typos and uniformising equal replies (e.g., writing the same country in the same way), to ensure their accurate categorisation and counting.

POLIS promised confidentiality to all respondents, by publishing the aggregated results of the survey but not publishing nor sharing individual responses with third parties. Thus, the reporting and analysis of the results in this report makes no specific mention that could enable identification of the source.

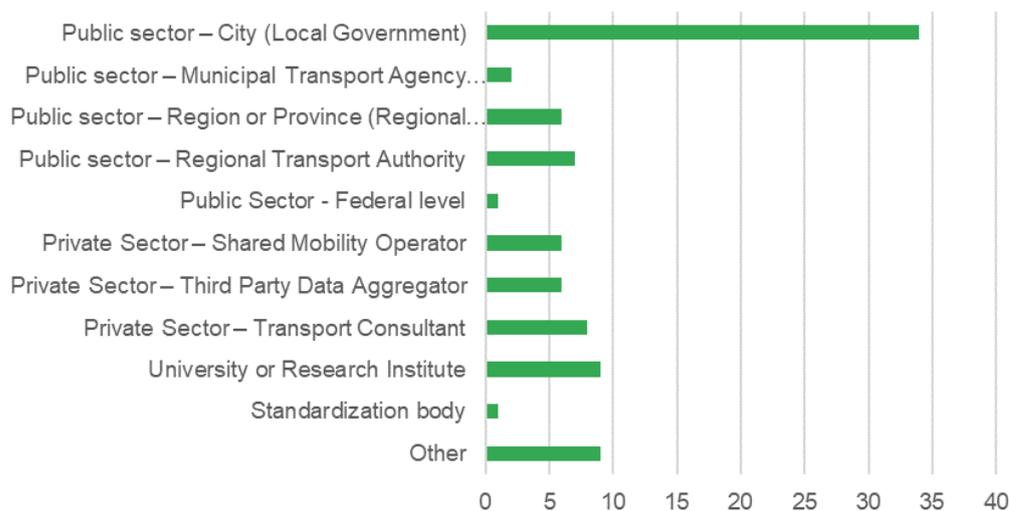


4. Who are the respondents?

4.1 Types of organisation

All 125 respondents were asked to indicate “*what category best describes your organisation*”.

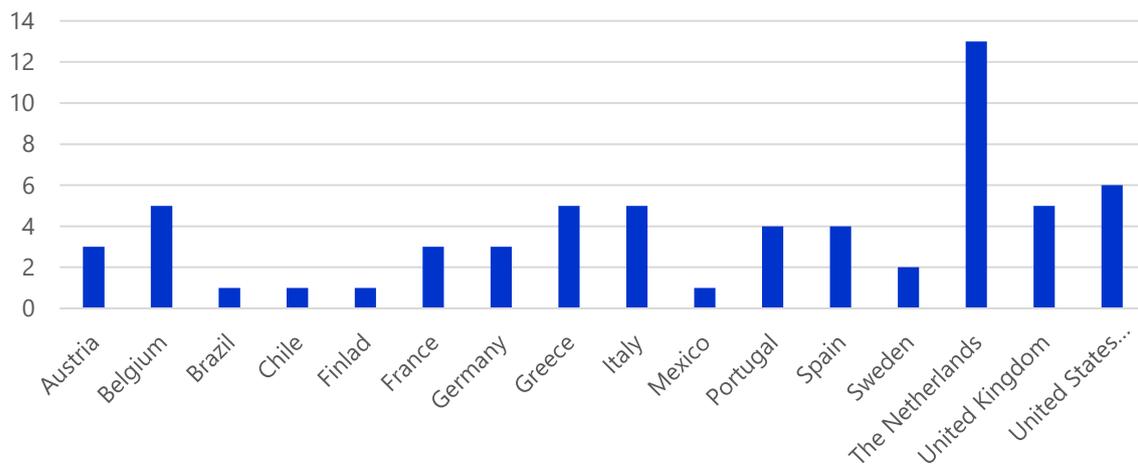
- Local level predominates: 46 respondents are from city government or a municipal transport agency or company;
- Regional level is present: 15 respondents are from a region or province, or from a regional transport authority;
- Shared mobility operators are present, with 9 respondents, from 8 different shared micromobility operators;
- Third party data aggregators are present, with 5 respondents, all from different companies;
- 16 respondents are from a university or research institute;
- 13 respondents are from a transport consultant;
- 21 respondents indicated other types of organisations, some of them providing more detail.



4.2 Countries of operation

Respondents from the local and regional level of the public sector (N=61, including local government, municipal transport agency or company, regional government and regional transport authority or operator) were asked to indicate the geographical area covered by their organisation’s jurisdiction or operations, and subsequently the country to which that geographical area belongs. Of these 61 respondents:

- The large majority comes from European countries (52);
- The Netherlands is the country with the highest number of respondents (13), followed by the USA (6);
- Mexico, Chile, and Brazil account for 1 respondent each.



Regarding the private sector – nearly all shared mobility operators and third-party data aggregators are operating in several countries, and asking them to enumerate all those countries would be fastidious, disproportionate to the goals of

the survey, and furthermore unnecessary (since that information is available to the public, online⁸).

With that in mind, these two types of respondents were not asked to provide a geographical reference, and on the questions about their data sharing practices they were asked to consider their activities *“as a whole”*.

The input provided by the 8 shared micromobility operators participating in this survey thus can be presumed to reflect corporate practices in several countries, across almost all continents, including **Europe** (Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Italy, Latvia, The Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland, Turkey, Ukraine and the United Kingdom), **MENA Region** (Israel and the UAE), **North America** (Canada and the USA), **Latin America** (Brazil, Chile and Mexico), **Oceania** (Australia and New Zealand) and **Asia** (Singapore and South Korea).

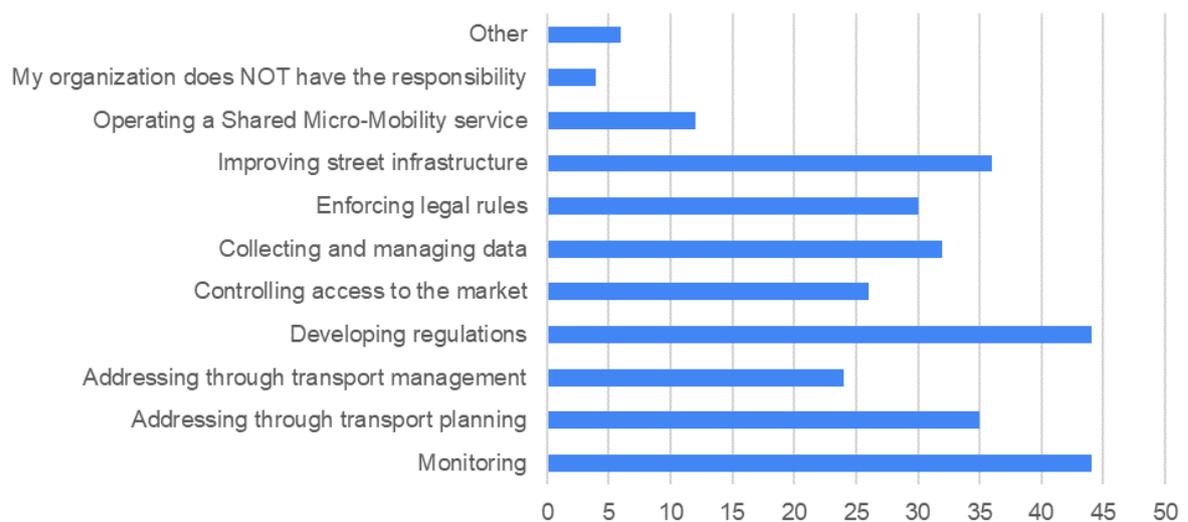
⁸ The NUMO New Mobility Atlas is a good source (cf. Reference section at the end of this Report).



5. Results

5.1 What are Public Authorities doing?

Respondents from the local and regional level of the public sector (N=61, including local government, municipal transport agency or company, regional government and regional transport authority or operator) were asked *“what are the responsibilities, or activities, of your public organisation in relation, specifically, to shared micromobility services?”*



This was a multiple-choice question, i.e., respondents could pick more than one option. Almost everyone is doing something (or has to). Only 4 respondents indicated their public organisation has no responsibilities nor activities related to shared micromobility services.

As for the most indicated activities/ responsibilities (the survey did not request a distinction), six leading options stand out:



- **Observing and regulating** predominate – “*monitoring*” and “*developing regulations*” are the two most cited options, often simultaneously;
- **Adjusting the infrastructure** to these new services is high on the agenda – “*improving street infrastructure*” or at least planning to do it (“*through transport planning*”) are the third and fourth most cited;
- Many are dealing with **data** – “*Collecting and managing data*” is the fifth most cited option;
- “**Enforcing legal rules**” is the sixth most cited option;
- Only 20% of the respondents indicated their organisation is **operating** a shared micromobility service.

5.2 Got some?

Most of these respondents from the local and regional level of the public sector⁹ (57, out of 61) have at least one shared micromobility service operating in their geographical area of jurisdiction or operations.

These 57 public sector respondents were also asked to indicate which shared micromobility services are presently operating in their area.

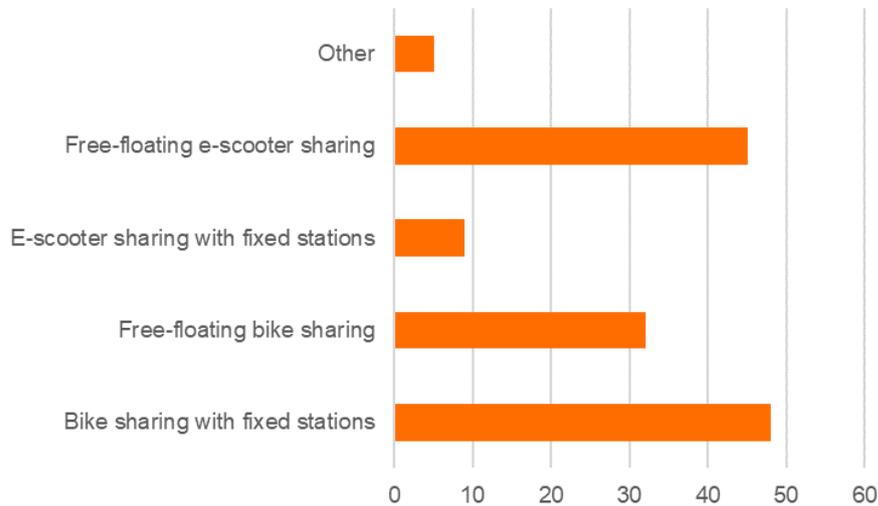
This was a multiple-choice question, on which several respondents picked more than one option:

- **Diversity** is the most striking insight – very few respondents had only one type of service;
- **Fixed-station bike sharing** was the sole service in only 4 sites (3 of those are the ones with no private operators);
- **Free-floating e-scooters** were the sole offer in only 3 sites.

⁹ As in the previous subchapter, considering only respondents from local government, municipal transport agency or company, regional government and regional transport authority or operator (N=61).

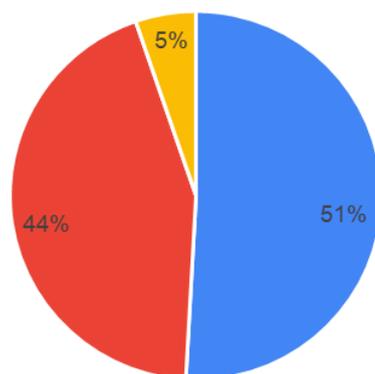


Free-floating e-scooters are a very common component of the shared micromobility offer (ca. 75% have it), as well as fixed-station bike sharing (85% have it).



Which shared micromobility services are presently operating in your area?

Finally, the private sector plays an important role. Most of these public sector respondents (54, out of 57) have **private** operators in their respective territory – only 3 of them don't have at least one private operator.



Are any of these shared micromobility services provided by an operator from the PRIVATE sector?

■ Yes, all of them ■ Yes, but not all of them ■ No



5.3 Are private operators sharing information?

Questions regarding the sharing of information (and its raw material, data) focused on a particular angle, among the many that were possible – specifically, the flow of information and data from *private* operators to public authorities.

This survey did not inquire about the reverse flow, nor about the sharing of information or data between public organisations. These distinct angles may raise pertinent issues, but they were simply not the priority of this survey.

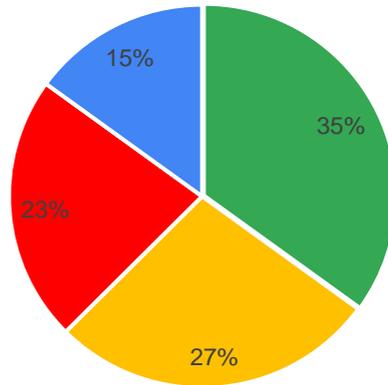
So, regarding the 54 respondents from the local and regional level of the public sector, who have at least one private shared micromobility service operating in their territory:

- Most (40) indicated their organisations are receiving some information (in one or more formats, e.g., maps, numbers or graphics, datasets, etc.) from private operators;
- Few (7) are not receiving any information;
- Few (7) answered “*I don’t know*”.

The 40 respondents who indicated their organisations are receiving information from all, or at least from some, private operators, were then asked if those operators share digital datasets with raw data:

- More than half of the respondents (25) indicated all of them do, or at least some do (but not all);
- 9 respondents indicated they do not;
- 6 respondents answered, “*I don’t know*”.





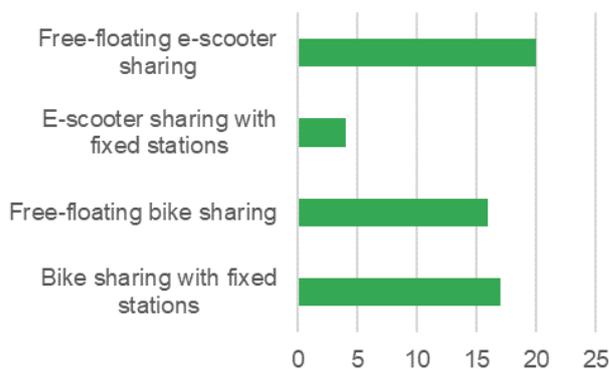
Is any one of those private operators sharing digital datasets with raw data?

■ Yes, all of them ■ Yes, but not all of them ■ No ■ I don't know

5.4 Digital datasets with what?

The following questions were answered only by those public authorities that were receiving digital datasets with raw data from private shared micromobility operators (N=25).

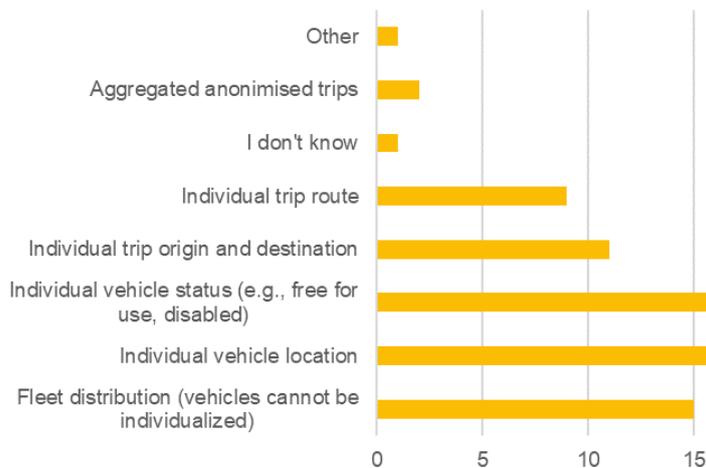
Almost all of these datasets come from free-floating e-scooters, and from bike-sharing (both free-floating and on fixed stations).



These datasets refer to what type(s) of service(s)?

And what do these digital datasets indicate? This was also a multiple-choice question.





The digital datasets shared with your organisation indicate what?

Some key aspects:

- Almost all respondents (23 in 25) indicated several **attributes**, with only one respondent receiving a single attribute;
- The three most cited attributes are individual vehicle status, vehicle location, and fleet distribution (in aggregate form);
- Only around half of the respondents (13) are receiving data on **trips**, either aggregated anonymised trips, individual trip routes, and or individual trip origin and destination.

One respondent commented:

“Very important is the granularity of the data. Though we do not want to collect personal data, we need individual data (of every single track), not aggregated data only.”

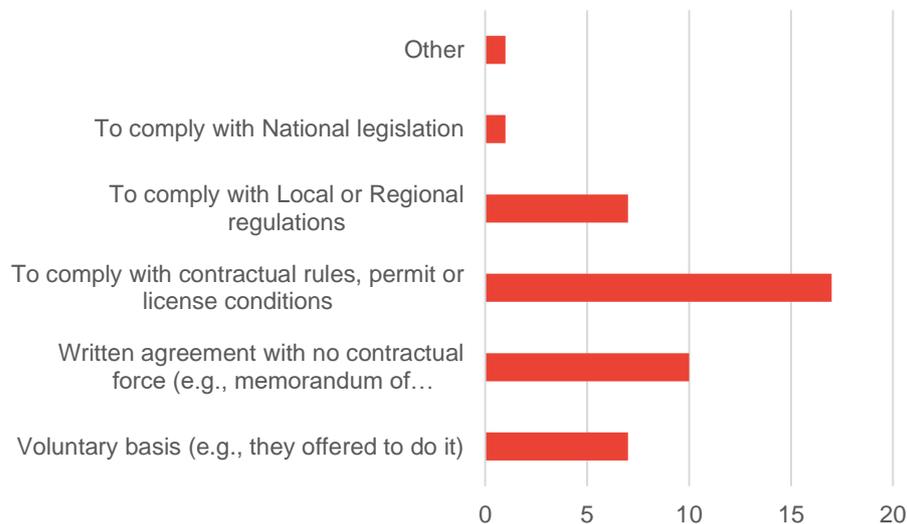
5.5 The sharing procedure

On what **basis** are public authorities receiving digital datasets with raw data from private shared micromobility operators? Respondents (N=25) answered a multiple-choice question.

- More than half (13) indicated two or more reasons;
- Compliance with *“contractual rules, permits or license conditions”* is the most cited basis;



- “Written agreements with no contractual force” are the second most cited basis (10), but rarely the only one.



On what basis are these datasets shared with your organisation?

One respondent shared its own experience:

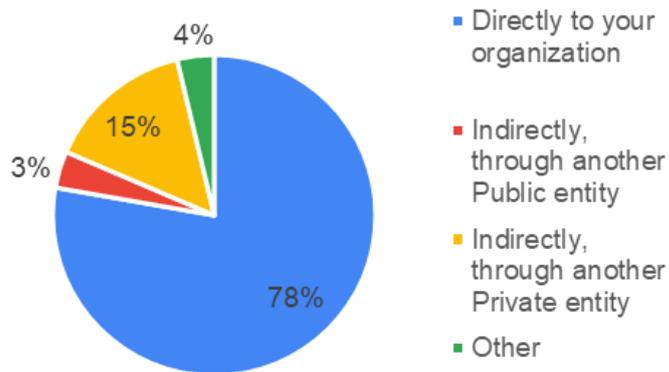
“I would like to push back on the use of the word “share” when used in the context of data. As a government entity obligated to manage the public right of way, consumer affairs/rights, and overall traffic and mobility for the broader public, [our public organization] has an obligation to require data reporting from those who we either regulate or contract with or those who have impacts on the public good. We always have collected and required data; it is not a new thing. The word “share” somewhat suggests some level voluntarism or mutual benefit. That is not the case.”

As to the **process**, a direct flow, with no intermediaries, seems to be the rule:

- More than 3 out of 4 respondents indicated the digital datasets with raw data are delivered directly to their organisation;
- The intervention of another private entity was mentioned by only 4 respondents;

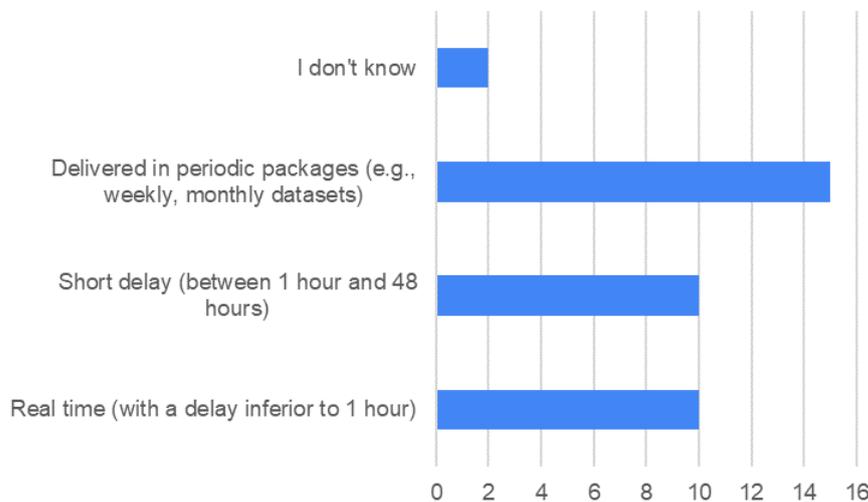


- 2 respondents indicated their organisation receives datasets both directly and indirectly, through a private entity (cases counted as "other").



How do private operators provide these datasets?

Are these data shared ***in real time, or with a delay?***



Are these data shared in real time, or with a delay?

Again, diversity seems to be the rule – many participants receive different data in different time frames. Vehicle location is usually delivered in real time or with a short delay and trip data is usually delivered in periodic packages.

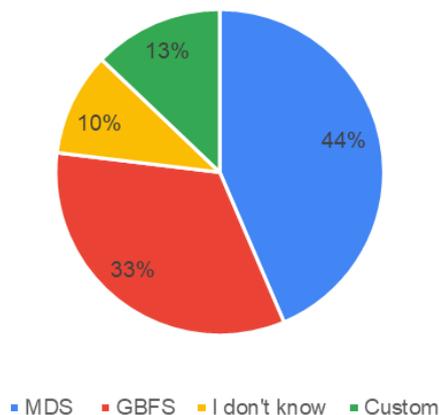


In sum:

- Well over half (17) are receiving data in real time (delay inferior to 1 hour) and/or with a short delay (between 1 and 48 hours);
- 6 are only receiving “*periodic packages*” (e.g., weekly, monthly datasets).

5.6 Data Specification – practice

Which data specifications, or formats, are mostly used to share these data with public authorities? The 25 respondents from the public sector were presented with a multiple-choice question.



Which data specification is used to share this data?

Three respondents didn’t know how to answer this question, but 22 did, and three quarters of those (17) are using MDS¹⁰.

¹⁰ MDS stands for *Mobility Data Specification*, an open-source format originally created by the Los Angeles Department of Transportation. In November 2019 stewardship of MDS and the ownership of this repository was transferred to the Open Mobility Foundation.



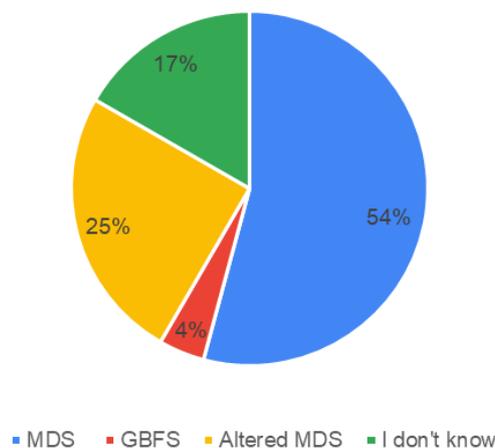
But there are important *nuances*:

- 5 are using *only* MDS, and an additional 12 are using MDS **and also** other formats;
- 2 are using *only* GBFS¹¹, but an additional 11 are using GBFS **and also** MDS;
- 5 respondents receive data in a custom format¹², 3 of which indicate that format alone.

This is the current practice, regarding data specifications – now, what about preferences?

5.7 Data Specification – preferences

These 25 respondents from local and regional authorities were asked “*what data specification, or format, do you consider the most appropriate to share these data with public authorities?*”



Which data specification do public authorities consider the most appropriate to share these data?

¹¹ GBFS stands for *General Bikeshare Feed Specification*, which was created in 2014 by Mitch Vars with collaboration from public, private sector and non-profit shared mobility system owners and operators, application developers, and technology vendors. The North American Bikeshare Association has supported and hosted it since 2015, and in 2019 chose MobilityData to govern and facilitate the improvement of GBFS.

¹² For the purposes of this survey, a “*custom format*” designates a format developed for, and used in, an individual a city, region, or country.



Everybody stated a preference, except 4 respondents who answered, *"I don't know"* (tellingly, the 3 that didn't know the format being used, plus 1 currently using a custom format).

In terms of stated preferences, MDS lead over the other formats grows – 17 respondents find it the most appropriate.

But here, again, there are important *nuances*:

- 13 indicate *only* MDS, and an additional 6 mention MDS **and also** other formats;
- Only 1 respondent mentions GBFS alone, and an additional 3 mention GBFS and also other formats;
- Some respondents mentioned an **altered version of MDS** format adequate to privacy concerns and multimodality.

Three respondents pointed out the relative advantages and vulnerabilities of GBFS and MDS:

- *"GBFS provides location and status of parked vehicles, but does not comprehend vehicle type";*
- *"MDS poses questions regarding privacy that have to be addressed and overcome; maybe a GBFS-Extended and an MDS-Light need to be considered";*
- *"GBFS is critical for real-time operations and MDS is critical to historical analysis".*

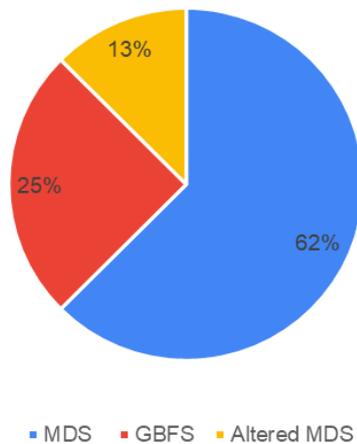
This is the public side. **What about the private?**

We asked the same question to shared micromobility operators and third-party data aggregators.

Of the 8 (eight) responding shared micromobility operators, *all are using MDS* and, except for one of them, also GBFS (reminder: our questions asked them, to respond considering their operations *"as a whole"*).

We can safely assume that many of them are, in some part of the world, also sharing data using custom formats determined by local authorities.





Which data specification do private operators consider the most appropriate to share these data?

When comparing practices with preferences, we find that:

- Only half indicate MDS alone;
- 2 prefer GBFS alone (i.e., they would rather drop MDS);
- One mentions *“a more privacy focused version of MDS, which incorporates aggregation and broader geographies rather than individual raw data”*;
- No one mentioned custom formats as the most appropriate.

One respondent commented:

“Mobility data sharing could (should?) aim to collect just enough data for mobility authorities to have a better understanding on the patterns, needs and even user profiles (not knowing the specific users without their consent, of course). Current specifications are too simple/humble (GBFS) or too complex/demanding (MDS). Maybe there should be something in between: a solution that is both scalable and flexible to consider all modes and vehicle types, and that can provide major desire lines and routes throughout a specific period respecting privacy concerns (meaning no individual routes, especially outliers in time-space analysis).”



5.8 Capacity and Challenges

Sharing data consists of more than mere transmission – for that transmission to be possible, and useful, several tasks must be performed, both before and after it takes place. Data have to be collected, cleaned, and prepared for transmission – and, once transmitted, must be checked (and often corrected), uploaded in existing databases and (if all of this is to serve any practical purpose) analysed.

All of these tasks require staff hours, of course, but also the necessary know-how and expertise, proper hardware and software, and an organisational framework that provides all of this, along with other key ‘ingredients’, like a clear purpose, reliable rules and procedures, and technical support when necessary.

In sum, data sharing requires that participating organisations have (or acquire) and invest in it several types of resources – in other words, it requires **organisational capacity**.

Well, is the capacity there?

There are no detailed and objective indicators established for this specific purpose – and if there were, we would be collecting them, not asking survey questions.

Hence, this survey chose to collect **perceptions and opinions**.

To frame the questions properly and put respondents at ease with what was being asked, the questionnaire explicitly mentioned that *“these questions may require generic and subjective assessments”*, and that *“learning about current perceptions is also useful”*.

The survey approached this issue through two different angles: the availability of *“the necessary resources”*, and *“the main challenges raised”* by data sharing.



One question was asked for each of these angles, with the question on availability of resources being asked *before* the question on challenges¹³.

These two consecutive questions were asked to two distinct sets of respondents:

- A **public** set, composed by the 25 respondents from the public sector, local and regional officials who indicated they are dealing with digital datasets with raw data provided by private shared micromobility operators;
- A **private** set composed by the 8 respondents from private shared mobility operators and the 5 respondents from third-party data aggregators.

This enables some degree of comparison.

These two sets reflect an option – we chose to ask these questions only to respondents who are **actually involved** in the data sharing practices the survey seeks to analyse.

Inquiring other public authorities about their perceptions and opinions on these same issues would no doubt be interesting and useful, but not for the goals of this survey.

On **resources**, the first question asked:

«In general terms, does your organisation have the necessary resources to deal with data sharing? »

Respondents were asked to indicate their agreement or disagreement with each of a series of individual statements, using a four-point scale (from 1 to 4), where '1' meant "I fully disagree", and '4' meant "I fully agree".

This scale had no intermediate point, and "I don't know" was not made available as an option for answering – thus, the survey assumedly 'pressed' for an opinion.

¹³ A question on "challenges" would more likely prime respondents to think about difficulties, easily contaminating the assessment on the availability of "the necessary resources".

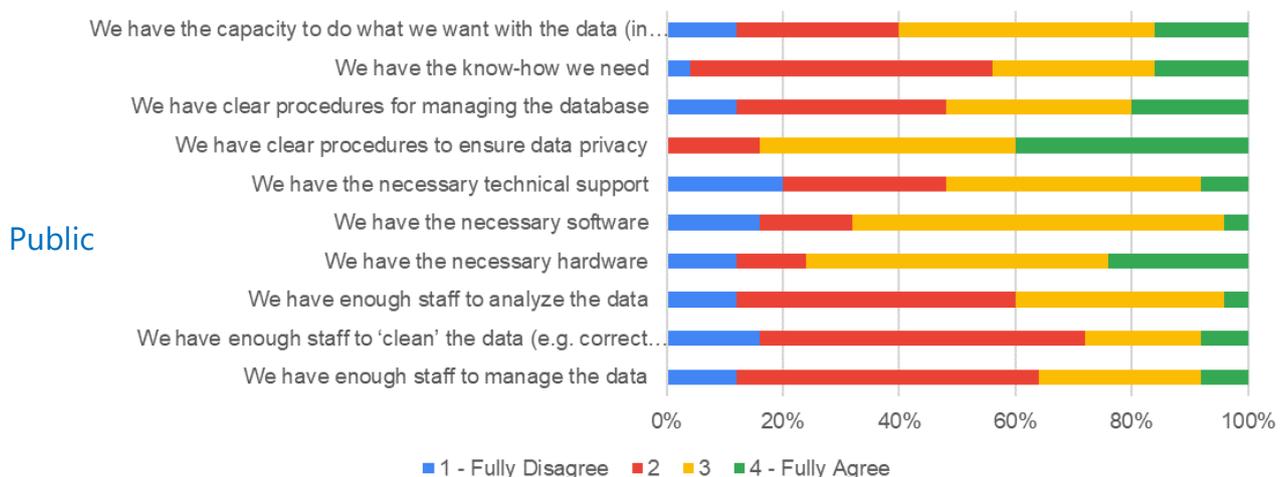


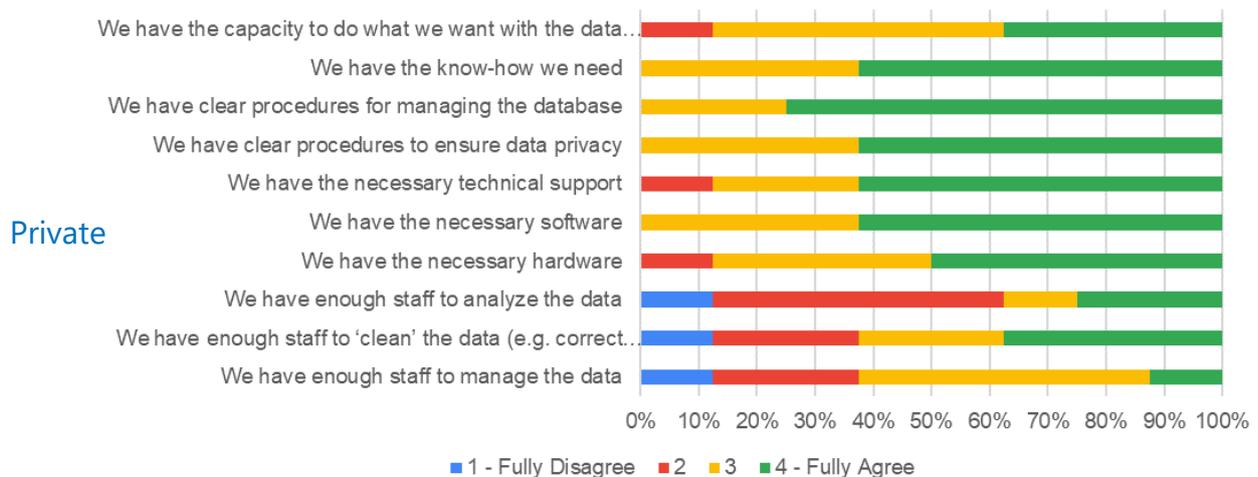
Both sets of respondents mentioned above were presented with the following statements:

- *We have enough staff to manage the data*
- *We have enough staff to 'clean' the data (e.g., correct positioning errors)*
- *We have enough staff to analyse the data*
- *We have the necessary hardware*
- *We have the necessary software*
- *We have the necessary technical support*
- *We have clear procedures to ensure data privacy*
- *We have clear procedures for managing the database*
- *We have the know-how we need*
- *We have the capacity to do what we want with the data (in legal limits)*

The results merit a global overview, and a 'sectoral' analysis, following four items: staff, procedures, IT ware and support, and overall know-how and capacity.

The first graphic illustrates the responses from the set of **public** respondents, and the second graphic the responses from the set of **private** respondents.





Overall, the responses show a ***much more positive assessment on the private side***, than on the public one:

- On all items, there is a substantively higher percentage of respondents from the private sector expressing agreement or complete agreement with these positive statements;
- On all items, the percentage of respondents expressing disagreement or complete disagreement is higher on the public side, especially for complete disagreement.

On the public side, the most positive assessments are reserved for two items – clear procedures for ensuring privacy, and the necessary hardware.

Staffing seems to be the ‘Achilles heel’ on the private side, with very positive assessments for all other items – which, no wonder, directly relate to their core business.

Let’s zoom in.

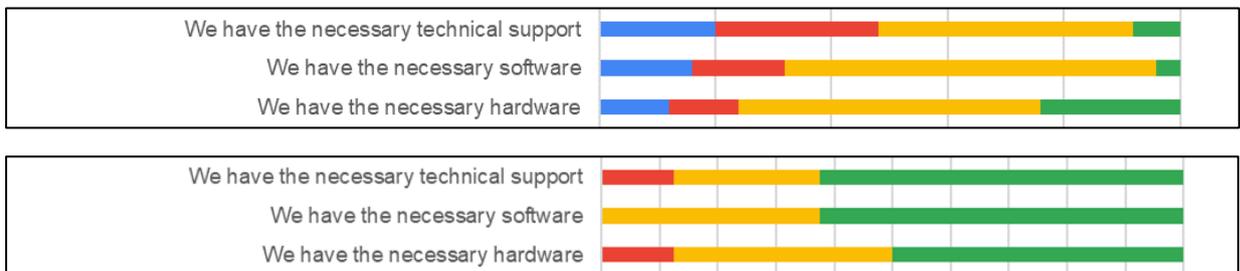
A more ‘sectoral’ analysis shows that ***staffing*** is, actually, the domain on which public and private sector perceptions and opinions are closer, although, here as well, the private sector (bottom graphic) has a more positive assessment.





[public on top, private at the bottom]

On the topic of **IT ware and support**¹⁴, the private sector clearly feels better equipped.



[public on top, private at the bottom]

The lack of “*necessary technical support*” indicated by several public respondents may be a matter of special concern, and deserves further inquiry, looking at the full spectrum of possibilities – it could be technical support to quickly fix technical malfunctions, but it could also be of a consulting nature. The fact is, without proper support, underperformance will emerge, remain, and discourage development.

What about **procedures**?

One must not underestimate the importance of having, in organisational settings, clearly established or official ways of performing key tasks.

¹⁴ IT stands for Information Technology.

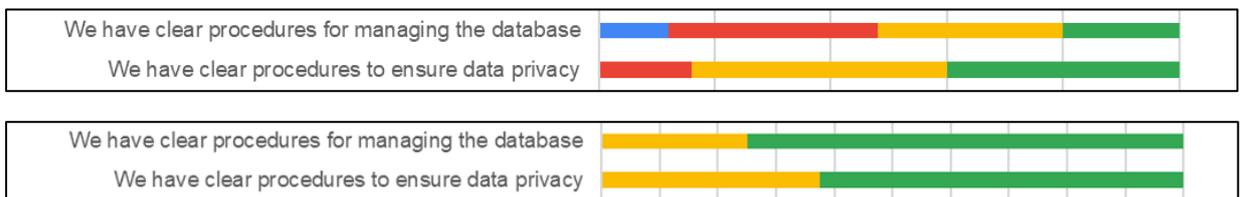


Clear procedures ensure respect for legal requirements and safeguard the organisation’s liability – but, for organisations involving several people in the execution of complex tasks, they are also a prerequisite for efficiency and improvement.

Without clear procedures in place, time is spent guessing and second-guessing, avoidable mistakes are made, work is lost, learning is happenstance, and improvement is curtailed.

Thus, having clear procedures for key tasks is a mark of organisational capacity. The survey asked respondents to assess two key elements: database management, and data privacy.

Here, again, the private sector (bottom graphic) clearly feels much better equipped. The lack of clear procedures for managing the database indicated by a few respondents from the public sector, should be another matter of special concern – mismanagement renders a database close to useless.



[public on top, private at the bottom]

Finally, on the more general topic of **overall know-how and capacity**, differences are also very clear.



[public on top, private at the bottom]



Maybe the most revealing comparison is this:

- All private sector respondents believe their organisation has the know-how it needs to deal with data sharing, with over half of them completely believing in that;
- Over half the respondents from the public sector disagree or strongly disagree with the same statement.

Moving on, let us now look at the second question, which focused on **challenges**, asking:

«What are the main challenges raised by data sharing from shared micromobility? »

Respondents were asked to pick, from a given list, the challenges they considered *“the most important for [their] organisation”*.

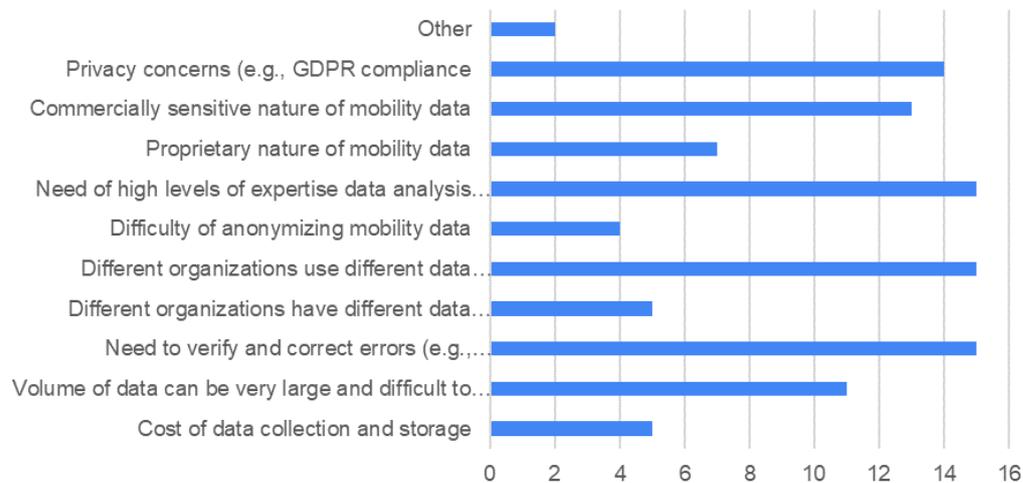
This was a multiple-choice question, with no top or bottom limits being placed on the number of choices – almost all respondents picked more than one item.

The two sets of respondents already mentioned above, from the public and private sectors, were presented with this list of ‘challenges’:

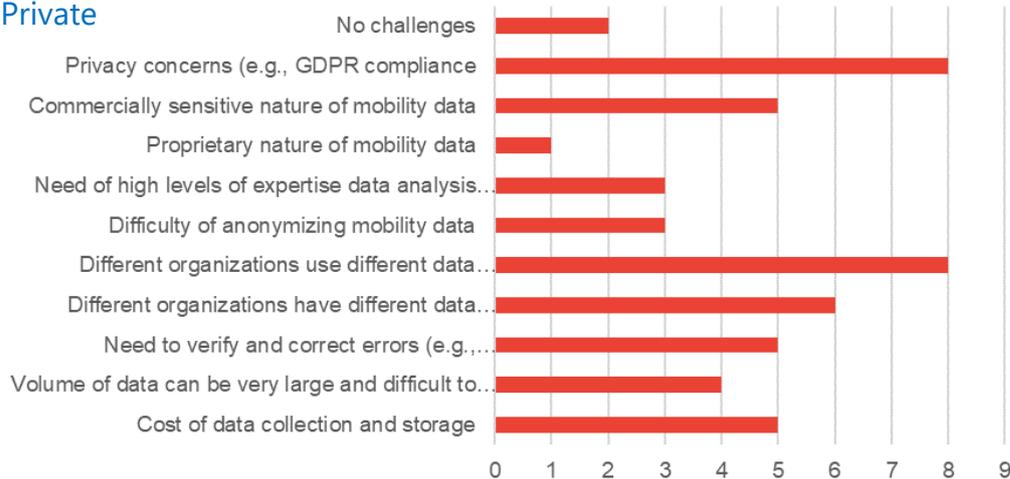
- *Cost of data collection and storage*
- *Volume of data can be very large and difficult to process*
- *Need to verify and correct errors (e.g., positioning errors)*
- *Different organisations have different data requirements*
- *Different organisations use different data specifications/ formats*
- *Difficulty of anonymising mobility data*
- *Need of high levels of expertise data analysis and visualisation*
- *Proprietary nature of mobility data*
- *Commercially sensitive nature of mobility data*
- *Privacy concerns (e.g., GDPR compliance)*
- *Other: [...]*



Public



Private



[public on top, private at the bottom]

Even considering there are more respondents from the public sector (N=25) than the private (N=13), some points stand out:

- On the public side, there are **more issues being flagged** as “most important” challenges by over 50% of respondents;
- **Privacy concerns** (e.g., GDPR compliance) are considered a top challenge on both sides;
- However, it is interesting (and perhaps surprising) to note that on the public side the concern with the “**commercially sensitive nature**” of the data is much *closer* to the concern



- with privacy, and the concern with the “**proprietary nature**” of data is much higher (in relative terms) on the public side;
- The use of different **specifications**/formats is also considered a top challenge for both sides;
 - However, the same does not happen with the use of different data **requirements** (more of a concern for the private side);
 - The need of high levels of **expertise** for data analysis and visualisation is a top challenge for the public side, being mentioned by more than half of its respondents, which does not happen on the private side;
 - The need to **verify and correct errors** (e.g., positioning errors) is also one of the top challenges for both sides, although more pronouncedly so for the public side, and for both sides it is followed closely by the difficulties of managing large volumes of data – two tasks that can be highly consuming in terms of staffing;
 - **Cost of data collection and storage** is, in relative terms, more relevant as a challenge for the private side.

5.9 How could sharing be made easier?

Considering the existing procedures, capacity, and challenges, how could public and private agents make data sharing easier *for each other*?

The same public (N=25) and private (N=13) sets of respondents mentioned in the previous subchapter were asked the same open question.

How could private shared micromobility operators make it easier for public authorities to deal with data sharing?



Public respondents stated the following¹⁵:

- **“Standardisation across the industry”**, with an agreement on data formats and requirements;
- **“More cooperation”**, with the public sector, with private operators *“proactively engaging with public sector bodies to provide data that meets their needs, possibly as part of a ‘no data/ no play’ arrangement”*;
- Providing data in a way that allows for **“all operators to be visualised together as one system”**, because *“it’s not relevant for us to have one dashboard for each operator”*;
- **“More availability to share raw data from the operation”**, but **“be more consistent with their data standard interpretation”**, *“clean the data themselves”*, and *“inform, in good time, about eventual changes on their data in order to prepare our system”*.
- **Technical support** from operators, through a *“handbook with clear instructions”*, or by providing *“clear and documented endpoints/APIs which are stable and have a minimum technical support team behind it”*, or with *“support fees adequate to cover costs associated with data analysis and visualisation (third party or dedicated municipal staff)”*.

And how could public authorities make it easier for shared micromobility operators and third-party data aggregators to deal with data sharing?

Here is what **private** respondents had to say:

- Adopting a **“privacy focused data standard”** across cities, with **“common data sharing requirements”**, which are *“associated with clear and specific use cases for mobility data”*;
- Participating in the **standardisation process**, through *“deeper involvement with standards communities”*, to ensure data specifications *“meet their needs and can address desired policy outcomes”*;
- Using **“a playbook of how to request the data and work with third party aggregators or internally”**, if they have the

¹⁵ Comments were aggregated according to topic. Choice of quotes (for exemplification) and bold letters by the authors of this report.



resources and capacity, because *“we've found that cities have **different interpretations of GDPR** and the exception ban within, and that leads to different paths and ramifications such as the sort of legal agreements that have to be in place, and in many cases this creates an impasse from local authorities because of the complexity to navigate the data-sharing legal requirements and processes needed”*;

- Public authorities should *“have better **security measures** to ensure low risk of data leakage, mishandling, etc.”*, and *“set up rules or specifications making it harder to breach GDPR when sharing data with them”*;
- Cities should *“make it mandatory for mobility operators to **share data through data processing solutions** offered by third-party data aggregators”* as *“a regulatory function of the city and a condition to maintain the permit”*, and in turn, *“cities should have strong agreements in place with third-party data aggregators to ensure data protection and prevent data misuse”*.

5.10 Are public authorities using shared data?

Public organisations can use data from shared micromobility for different purposes. What have these shared data been used for, and how often?

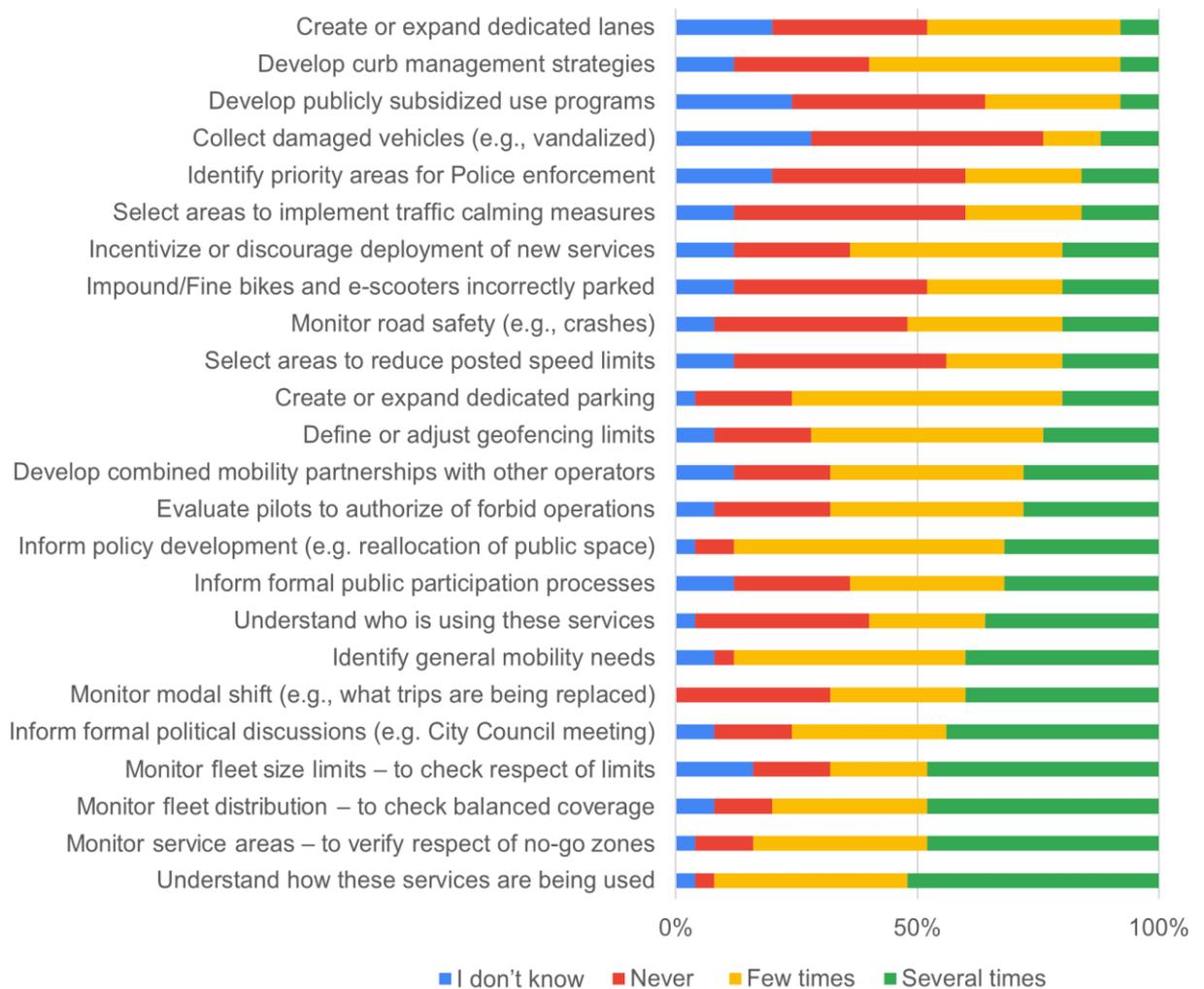
The set of public sector respondents directly dealing with shared digital datasets, mentioned in the previous subchapter (N=25), were asked to indicate, for each (potential) application, how often (if ever) shared data had been used for that purpose – *“never”*, *“few times”*, or *“several times”*. *“I don't know”* was also an option.

The questionnaire presented a list of 24 potential applications, which were collected and systematised through desk research



from several sources – including published documents on use cases¹⁶, and input from POLIS member cities and regions.

These potential applications were presented in a continuous list¹⁷. The results merit both some global comments, as well as an analysis by ‘clusters’, composed by affinity.



¹⁶ Especially considering NUMO and POPULUS resources (cf. Reference section at the end of this Report).

¹⁷ For the full list and used order, cf. questionnaire (Annex A, Question 22).

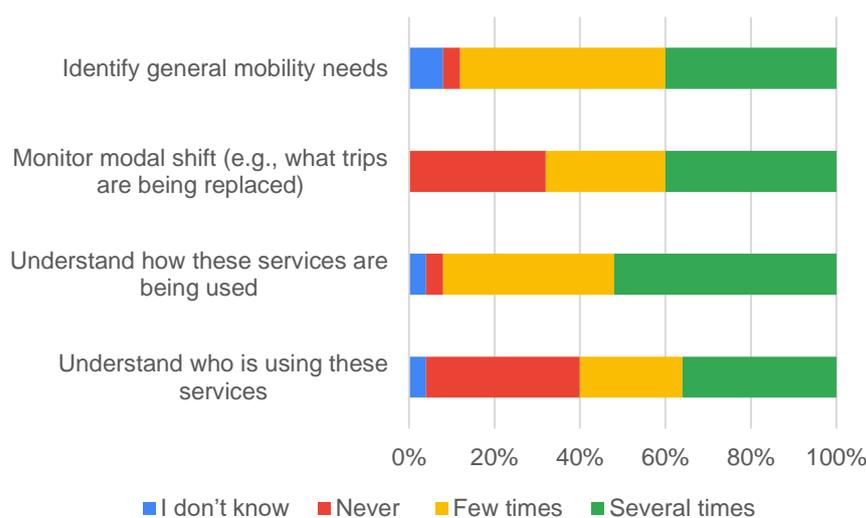


On a general note, we can see:

- The **most reported** uses of the shared data are related to monitoring – of general mobility behaviour (mobility needs, how these services are used, etc.) and of service performance (fleet distribution, service areas, etc.);
- The **least reported** types of uses are related to enforcement, road safety and adaptation of infrastructure or its management, i.e., three topics where action is instrumental to deal with the most frequent complaints and concerns about the impact and risks of shared micromobility in city streets.

For a more detailed analysis of these responses, we clustered the 24 items by affinity (please note that this clustering was *not* used in the questionnaire).

First, a more ‘general’ **monitoring and understanding** of mobility behaviour, including general mobility needs and modal shift, as well as how and by whom are these services being used.



Two things are clear:

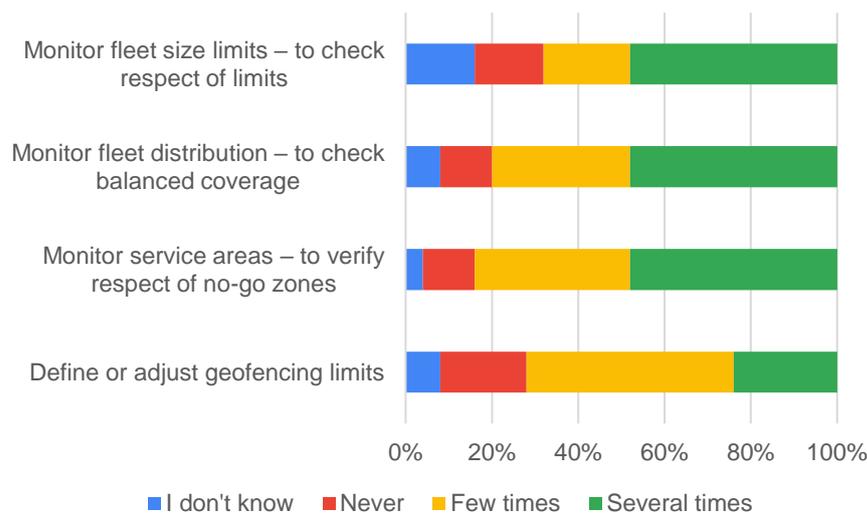
- More than half of the respondents have engaged “several” or at least “a few” times in all these applications;
- There is a difference between the 2 more ‘general’ and the 2 more ‘specific’ applications, as almost everybody worked on the general ones, but almost 40% never used the data to check for modal shift or for who is using these services.

Is it because the shared data do not allow for that analysis to be made? Or because that analysis requires key resources (e.g., expertise, updated mode split data, etc.) that are not available inside the public authority? Or because it is not seen as a priority?

These questions require further consultation.

Let us now look at the use of shared data to **check for compliance** with operational rules by the operators.

Public authorities (often) set rules for the operation of shared micromobility services, on the fleet size (e.g., setting a maximum limit), its distribution (e.g., so a balanced coverage includes in lower-income areas) and zones where service is not allowed. Many of these rules are translated into geofencing limits.



Two trends stand out:

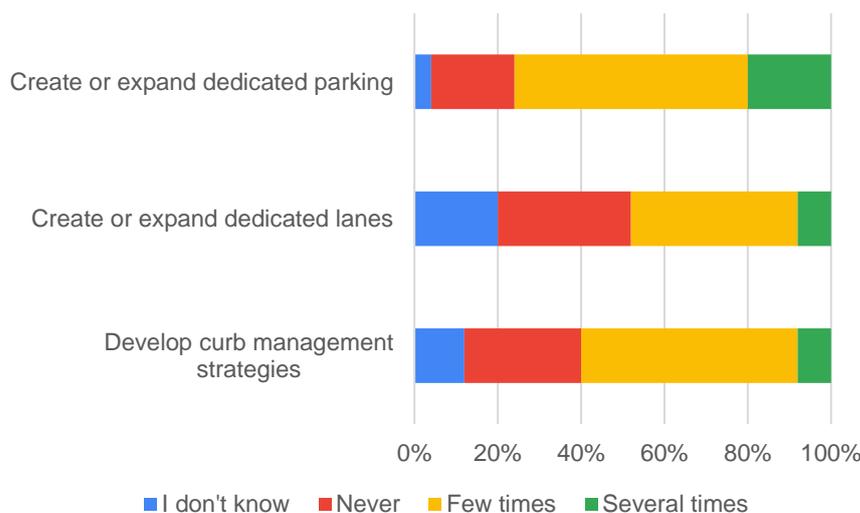
- **Monitoring compliance** with the rules are quite common applications, that have been done by 75% of the respondents, including “*several times*” by almost half of the respondents;
- By comparison, using the data to define or adjust **geofencing** limits is not as frequent, and there are more respondents saying they “*never*” did it.

One expects the definition and adjustment of geofencing limits to be less frequent than the monitoring of rules, supposedly a more ‘ongoing’ activity.

However, the (slightly) higher proportion of respondents saying their public authorities have “never” done it, deserves further inquiry – geofencing is instrumental to both these operations and their oversight, and it is important to understand if these public authorities (and others) do not use this tool by option, or because of lack of capacity.

The next cluster: **infrastructure design and management**.

It is worth noting, first of all, that when these services arrived, the most vocal complaints were about **circulation** and **parking** of e-scooters and dockless bikes on sidewalks (many users were afraid to ride in the roadway, and all parking was reserved for cars).



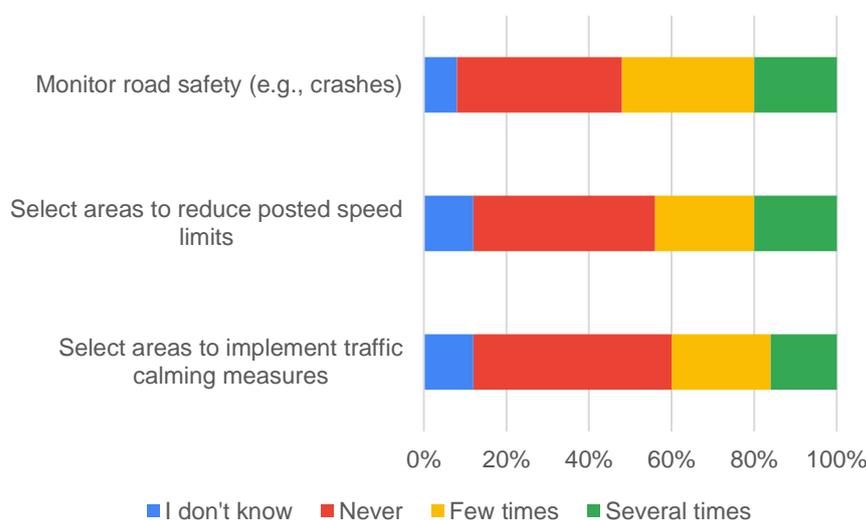
So, are shared data being used to create or expand parking or dedicated lanes for bikes and e-scooters? Or to develop curb management strategies?

The overall response seems to be 'yes, but...'

- **Parking** is more frequent, but hardly frequent enough: almost 80% have used shared data to create or expand dedicated parking, but only 20% have done it "several times";
- Over 50% have used shared data to create or expand dedicated lanes, or develop **curb management** strategies, but less than 10% have done it "several times", and around 30% have "never" done it.

Furthermore, the fact that 20% "don't know" if these data have been used for creating or expanding dedicated lanes is quite troubling, since that is (at least in theory), in what regards transport planning, one of the most direct and visible applications, and also one of the best arguments to gain leverage for the expansion of cycling infrastructure.

What about **road safety**?



Upon the arrival of shared micromobility services, road safety was a frequent topic in the public debate, with marked differences in approach – some advocated for acting upon the user and the vehicle (making helmets mandatory, imposing automatic speed limitation in the vehicles, etc.), while others advocated for acting on the infrastructure, especially to reduce speeds of motorised vehicles (objectively, the main source of danger).

As mentioned above, road safety is, overall, one of the least reported applications of the shared data.

It is important to note that the low usage of these data to monitor road crashes may be due to the lack of specific attributes in the data (i.e., the shared data may not inform about crashes). This is a limitation of the data (and the survey did not inquire about that).

However, this low usage can also be due to the lack of internal databases and procedures for monitoring road safety at the local level – and that is a limitation *of the organisation*. This specific item requires further consultation.

60% of the respondents never used these data to plan for **traffic calming**, or do not know if it was ever used for that effect (which, by itself, is not a good indication).

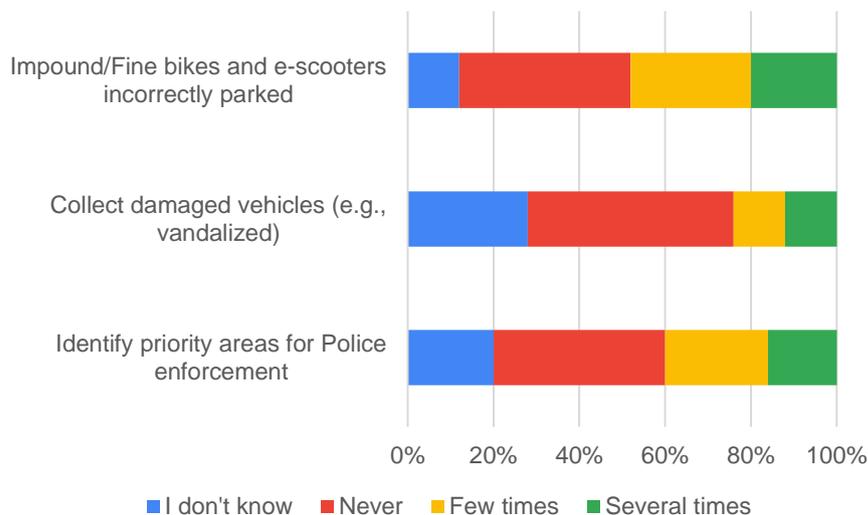
The low usage of data to advance traffic calming (either through reducing speed limits, or implementing other measures) should be a matter of special concern:

- Micromobility users are among the most **vulnerable users** of the roadway, and their number is growing, among other factors due to the availability of these shared services;
- **Reducing** the **speed** of motorised vehicles is the most effective way of reducing the number and severity of crashes, and of improving the safety of all road users, especially the most vulnerable;
- After decades of **car-centric transport planning** and management, many urban areas have street networks that enable speeding by motorised vehicles, and traffic calming is a key measure to prevent that (illegal) behaviour.



Another common topic in early ‘public debates’ – **enforcement**.

Are public authorities using shared data to impound and or fine incorrectly parked bikes and e-scooters? To identify priority areas for police enforcement? To detect and collect damaged vehicles?



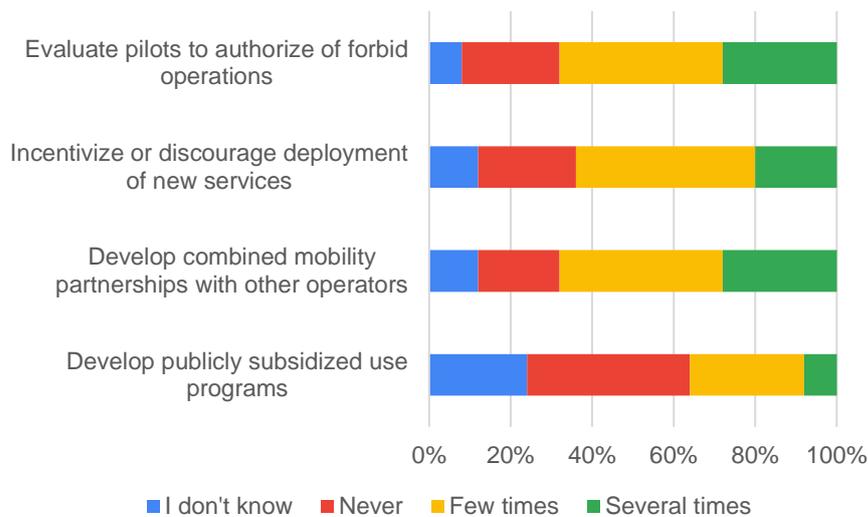
These are, in relative terms, the least used applications:

- In all cases, shared data have never been used by at least 40%;
- Collecting damaged vehicles is the least reported application: less than 25% have done it, and almost 50% have never done it.¹⁸

Let us now look at the use of shared data to **regulate deployment** and **develop public-private partnerships**.

¹⁸ This may be because, usually, this task is undertaken by the operators themselves.





Three results stand out, about the utility of shared data:

- It plays a role on **decisions about deployment**: more than 60% reported having used these data “several” or a “few” times¹⁹, both to evaluate pilots, and to incentivise or discourage deployment of new services;
- It is important for public promotion of combined mobility, having been used by over half the respondents (almost 70%) to develop partnerships with other operators for that purpose;
- It has already been used by almost 40% to develop publicly subsidised use programmes.

One respondent commented clearly made the link between data sharing, capacity to exploit, and deeper cooperation:

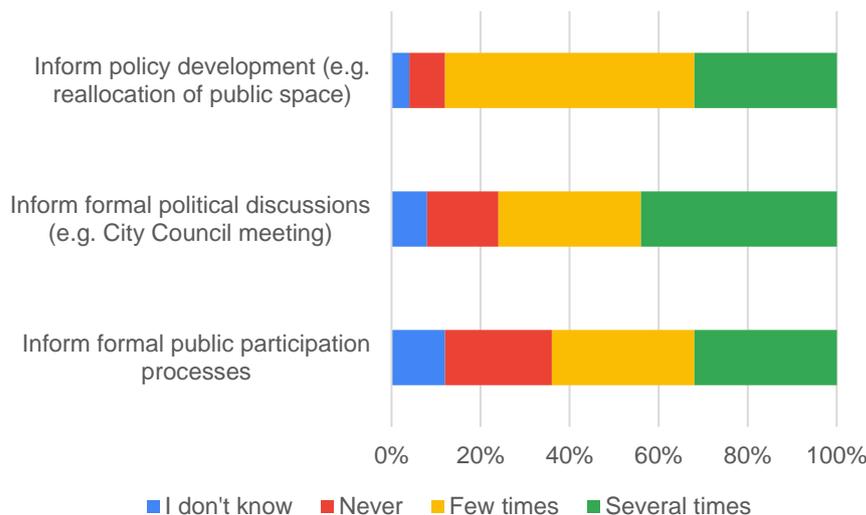
“The public administration must have a strong expertise in data exploitation to try to develop policies with data analysis. If so, data sharing for urban sharing services must be mandatory and, at the

¹⁹ This number is perhaps more revealing than the percentage on “several times” alone, since the frequency with which public authorities ponder authorising the deployment of these services depends, first of all, on operators requesting that authorisation. The same goes for incentivising or discouraging that deployment.



same time, sharing services (or part of them) should be eligible for receiving public subsidies (such as public transport).”

Finally, are shared data **informing the political process**, from, public participation to policy development?



Clearly, yes:

- Almost 90% report shared data have been used to “inform policy development”, which explicitly includes reallocation of public space:
- Almost 80% report it has informed “formal political discussions”, which explicitly include City Council meetings, with over 40% reporting that has happened “several times”.

On this specific topic, two additional comments are in order, and advise further consultation:

- How does the high usage in “policy development” relate to the much lower usages reported above for road safety, infrastructure improvements and enforcement? These are key topics for urban mobility policy, and it makes sense to expect data to be instrumental in the implementation of policies developed with data.



- A total of 8 respondents reported having used shared data “several times” to inform public participation processes – they are the same that also used it “several times” for policy development – is there a link?

5.11 Higher-Level Outcomes

Above and beyond these potential ‘direct’ applications of shared data, what can be expected in terms of higher-level outcomes?

Policy outcomes can be defined as “*the ultimate changes that a policy will yield*”²⁰. Systematic data sharing between distinct organisations necessarily requires the adoption of a series of interconnected principles, guidelines, and practices which, taken together, can be considered a policy.

Through their data sharing policy, public authorities acquire a resource – data. But ‘having data’ for the sake of ‘having data’ cannot, obviously, be the goal of a data sharing policy. Moreover, it is legitimate for both parties involved in this ‘sharing’ to expect these data to be a means to an end, and not an end-in-itself.

In the previous subchapter, we analysed the ‘output’ of these data sharing policies, i.e., the ‘immediate’ effects of having these data available – are they being used in specific tasks related to the mission of public authorities?

Now we will analyse expectations about the ultimate changes these policies can contribute to – the potential *outcomes*.

All respondents (N=125) were presented with a list that included various potential higher-level outcomes.

These were collected from a few sources, especially including NUMO’s micromobility data platform²¹ and expectations voiced

²⁰ “*The Public Impact Fundamentals*” (cf. Reference section).

²¹ For NUMO’s resource, cf. Reference section at the end of this Report.



by public and private participants throughout the meetings of POLIS' Working Group on Governance & Integration.

The systematised list of 13 higher-level outcomes consisted of the following:

- *Improve access to necessities, social mobility, quality of life;*
- *Improve access to micro-mobility services, especially in underserved communities;*
- *Facilitate access to micro-mobility vehicles, with a short walk;*
- *Increase road safety for riders and residents of all ages and abilities;*
- *Improve the infrastructure for riding and parking micro-mobility vehicles;*
- *Reduce unsafe riding behaviours, and better understand safety incidents;*
- *Ensure shared micro-mobility vehicles are safe and withstand use;*
- *Reduce overall energy consumption by shared micro-mobility operations;*
- *Accelerate the shift towards more energy efficient transport modes;*
- *Minimise the negative environmental impacts of redistributing, and recharging vehicles;*
- *Increase the lifespan of shared micro-mobility vehicles;*
- *Increase understanding of how, where, and by whom these services are being used;*
- *Increase the understanding and respect between riders, residents, and other road users.*

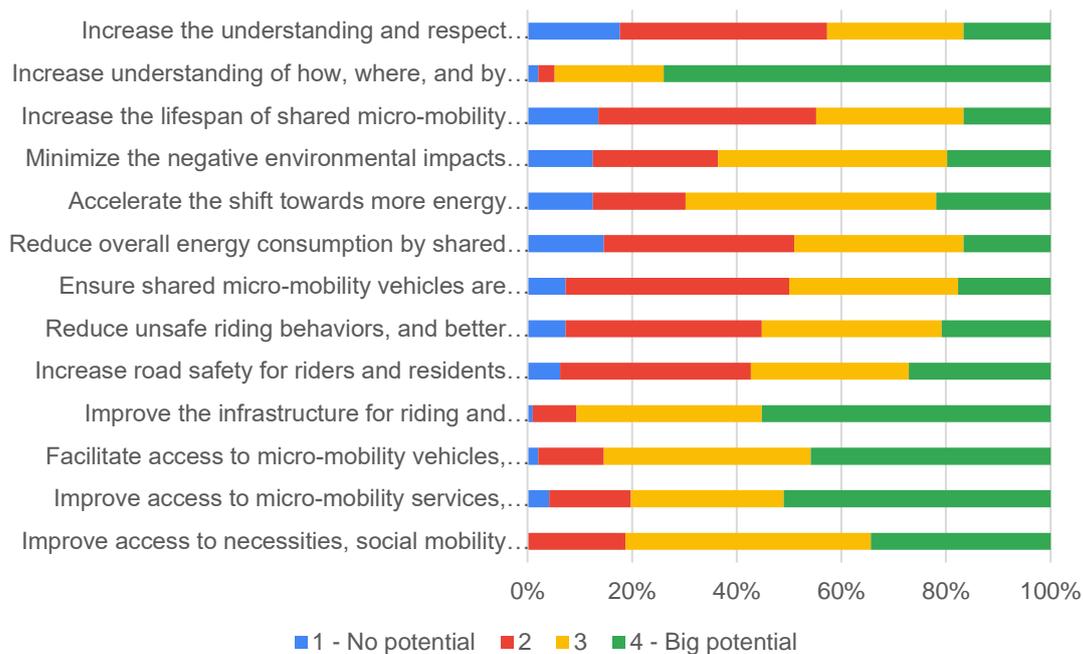
The question stated that data generated by shared micromobility services *"can help public authorities achieve higher-level outcomes"*.

It then asked *"how much can data sharing help in each of the following outcomes? Please indicate the potential you perceive"*.

Asking about a perceived potential is, assumedly, asking for a subjective assessment, that is to say, an **opinion**.



For this, respondents were given a four-point scale, with no midpoint, going from 1 to 4, with '1' meaning "no potential", and '4' meaning "big potential". There was no option for answering "I don't know" – again, 'pressing' for a position.



Overall, **higher** expectations for three types of outcome:

- The top expectation – increasing the **understanding** about the use of these services (by whom, where, and how);
- Second in line, a set of four outcomes that are directly related to **improving the use of the service and its contribution to the public interest** – improving the infrastructure, facilitating access to the vehicles and to services, and improving access to necessities, social mobility, and quality of life;
- Third, the **environmental gains**, both the impact in these services themselves (minimising the negative impacts of redistribution and recharging vehicles) and the contribution of these services on urban mobility as a whole (to accelerate the shift towards more energy-efficient transport modes).



On the other hand, we can also see **lower** expectations on the potential contribution of data sharing for three types of outcome, for which more than 50% of the respondents see little or no potential:

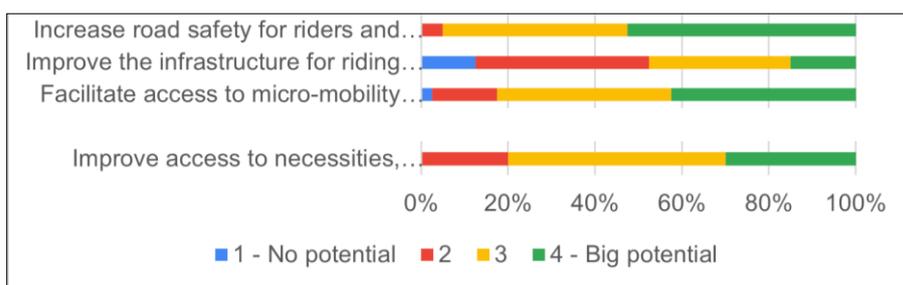
- Increasing the **lifespan** of shared micromobility vehicles (as well as ensuring they are safe and withstand use);
- Reducing the overall **energy consumption** by shared micromobility operations;
- The least expected outcome: increasing the understanding and **respect** between riders, residents, and other road users.

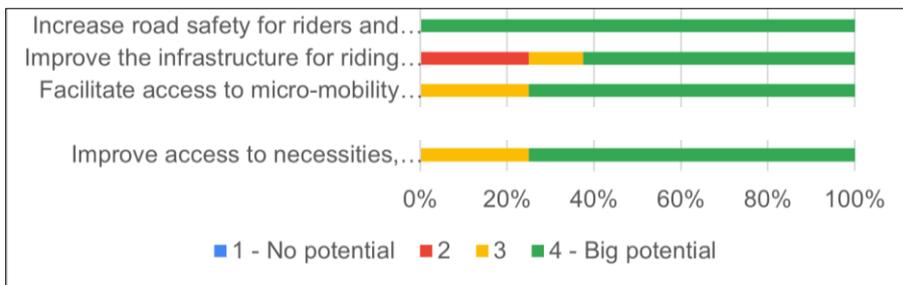
As mentioned, the results above are for the responses provided by all survey participants (N=125), from both the public and the private sector, and including those who are not dealing directly with the sharing of digital datasets with raw data.

We conducted further analysis of the results, zeroing-in on the responses provided by two sets of participants who are, in fact, dealing directly with these data – the public officials (N=25) mentioned in the previous subchapter, and the shared micromobility operators (N=8).

On most of the outcomes, the responses from these two groups are fairly aligned with the responses from the full sample: there are some differences, to be sure, but some degree of variability should be expected.

However, by comparing the responses between these two groups, three differences stand out. The following graphics show this (public responses on the first graphic, in this page, and the responses from private operators on next page graphic).





[public graphic previous page, private operators graphic above]

Private operators have much higher expectations about the contribution of data sharing to:

- Increase road safety and improve the infrastructure;
- Facilitate access to micromobility vehicles;
- Improve the impact these services can have on improving access to necessities, social mobility, and quality of life.

5.12 What about other transport services?

A final question asked of all the respondents (N=125):

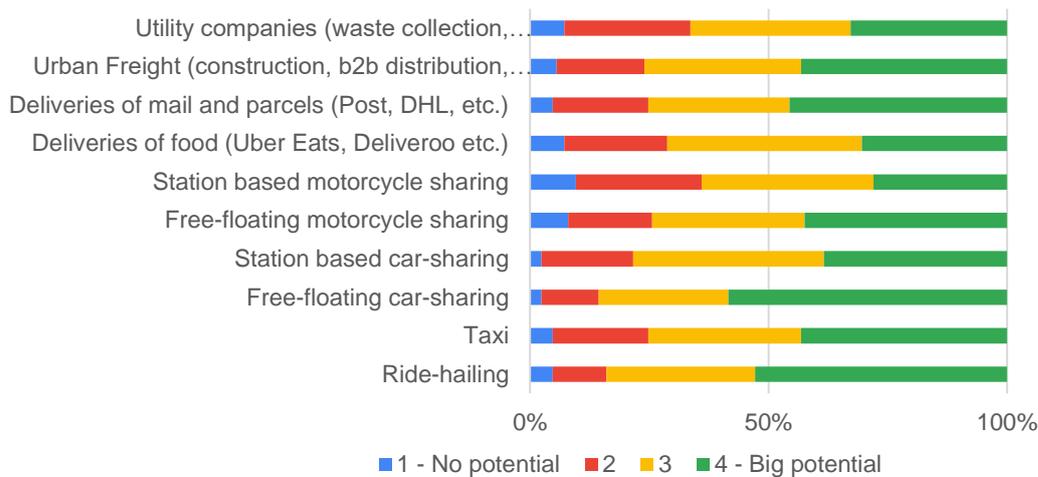
“Other types of urban mobility and transport services could also share data with public authorities, and some already do.

How much can sharing data from these sources help improve urban mobility? Please indicate the potential you perceive.”

Respondents were asked to use a four-point scale with no middle point, from 1 to 4, with ‘1’ meaning “no potential”, and ‘4’ meaning “big potential”. No option for answering “I don’t know”, to ‘press’ for a position.

They were presented with a list of 10 types of urban mobility and transport services. So, what do we see?





Important insights stand out:

- Clearly, **the potential is there** – on all types, at least 70% respondents see some degree of potential, including at least 30% perceiving “big potential”;
- Perceived potential is **higher** in free floating car-sharing, closely followed by ride-hailing;
- Perceived potential is **lower** for station-based motorcycle sharing, and utility companies, with over 30% of respondents perceiving low or “no potential”;
- **Urban freight and deliveries** of mail and parcels stand out, since more than 40% perceive “big potential” for both.

Some interesting nuances arise. Perceived potential is...

- ...**higher for ride-hailing than for taxi**, possibly because, in most taxi operations, clients do not use data-generating apps (let’s not forget, however, that GPS tracking came to the taxi sector before digital ride-hailing even existed);
- ...**higher for free-floating than station-based car sharing**, possibly because the latter has less of an impact of parking availability, and cars cruising for parking are less of an issue;
- ...**higher for urban freight than for utility companies** (waste collection, maintenance services), possibly because the latter are less frequent (let’s not forget, however, they also have an important impact on urban traffic).



One respondent commented:

"It is important to make sure requirements for shared micromobility are also imposed to other modes and business models. If we require shared e-scooter providers to give detailed information on their operations, but don't require that from car sharing, ride hailing, taxi or Public Transport, we're using the wrong reasons [to demand data sharing from micromobility]. Providing data can be very costly, and in a low-profit market [as micromobility] this can be the death of a mobility solution that has a relative low impact on the urban fabric (compared to ride-hailing and car-sharing)."

Another respondent called the attention to potential difficulties:

"Enforcing data sharing by commercial companies is not easy in all cases – [for example], there is no formal contact [nor] contract with DHL about their services in our city."



6. Conclusions

Before drawing any conclusions, we must first bear in mind two limitations inherent to the methodology used in this survey:

- This is an **exploratory** survey – it used a convenience sample, that is not statistically representative of the full universe of potential respondents: therefore, these results cannot be extrapolated to that full universe;
- This is a **survey** – it asks previously determined questions and counts answers from (mostly) closed sets of options given for that effect: it asks about practices, opinions, needs, but does not enable a deeper, qualitative exploration of the reasons behind the answers (for that, research uses other tools²²).

With due consideration to these limitations, we can take some conclusions from these results – specifically, about sharing practices, data applications, and organisational capacity.

First, about **sharing practices**:

- **Sharing is more of a formal requirement** than a voluntary initiative – sharing as a something made mandatory by contractual rules, permits or license conditions, is the most cited basis, and although *written agreements with no contractual force* are the second most cited basis, they are (very) rarely alone;
- There is a **shared concern about privacy** – but the concern about commercially sensitive data is more ‘intense’ for public actors;
- Both public and private parties find **standardisation of data specifications and requirements** to be very important.

Second, about **data applications**:

- Shared data seem to be used **more for general purposes** than for activities with a direct effect in the field – the most

²² Especially interviews and focus groups.



reported uses relate to monitoring, the least reported uses relate to enforcement, road safety and adaptation of infrastructure or its management;

- **Private operators have much higher expectations** about the impact data sharing can have on improvements that are important to the growth, safety, and positive social effects of their services;
- There is **clear potential to widen data sharing policies to other types** of urban transport and mobility services – many of which have a much stronger impact on traffic behaviour.

Finally, about **organisational capacity**:

- There is a **capacity gap** between the public and private organisations involved in data sharing – aside from staffing, which seems to be a challenge for both sides, private operators report much more positive assessments;
- This capacity gap **will grow**, because it is driven by factors that are directly related to the core business of private operators (procedures, IT ware and support, overall know-how and capacity), and comparatively peripheral to the mission of local and regional authorities.

This **capacity gap poses problems to both sides**:

- It diminishes the ability of the public sector to obtain and use insights critical to improve the streets on which these services operate, and thus to make them safer and more appealing;
- It hampers the ability of the public sector to monitor and enforce rules, creating an environment that does not reward complying operators, and that systematically harms public acceptance (and potential growth) of these services;
- It fosters a defensive posture and delays the building of trust that is indispensable to growing public private partnerships, including combined offers and publicly subsidised use.



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Appendix A - Questionnaire

The survey was conducted through the questionnaire below, which was made available to respondents in an online setting, using software from Google.

The questionnaire was dynamic, i.e., respondents would see only one section at a time, and responses to filter questions (screeners) could make the respondent automatically “jump” (skip) over some sections, without being aware of that (questions and response options are numbered below, for easy reference, but were not numbered in the online questionnaire).

All content within [BRACKETS] in the version below was not presented to the respondent.

POLIS welcomes the application of the whole or parts of this questionnaire by other non-profit organisations, for compatible purposes – in return, we’d like to learn about the results.

Sharing Data from Shared Micro-Mobility

Shared Micro-Mobility services are available in many cities and regions. Their operation often generates digital data about the number, spatial distribution, and use of these vehicles.

This data can be useful for various transport-related activities, from planning to management, research, and enforcement. Do PRIVATE operators share this data with PUBLIC authorities? How do they share it? What about public authorities who receive this data? Are they using it? For what purpose?

Data sharing practices vary from place to place. Knowing those practices and understanding the needs and preferences of public authorities and private operators will help us address common challenges, for the benefit of all.

For the purposes of this survey, “Shared Micro-Mobility Services” designates services which provide vehicles for (usually) short trips inside urban areas. These vehicles are BICYCLES (with or without electric power), STANDING ELECTRIC SCOOTERS (also called e-scooters, or kick-scooters), and (rarely)



other small devices. These vehicles can be found in fixed stations, or “free-floating” in public spaces (i.e., they are not fixed to specific locations). The use of this service is generally paid, and commonly requires (not always) the use of online apps.

The goal of this survey is to learn about the current practices and opinions of different organizations (public or private) regarding the sharing of data generated by Shared Micro-Mobility services.

This survey is organized by POLIS, the leading network of European cities and regions committed to Transport Innovation (www.polisnetwork.eu). We will publish the aggregated results of this survey, but will NOT publish the individual responses, nor share them with third parties – your responses will be treated as CONFIDENTIAL.

For any questions regarding this survey please contact, at the POLIS Network:

Pedro Homem de Gouveia – pgouveia@polisnetwork.eu

Responding to this survey usually takes about 10 to 15 minutes. Please remember to click the SUBMIT button when you reach the end. Thank you very much for your participation.

Ready to start?

Let's go!

[SECTION # 2]

Who is responding?

This survey addresses the realities and practices of organizations. We know it can be difficult to collect the official positions of large organizations. Because of that, we also welcome replies from experienced individuals. Please remember, ALL responses will be treated confidentially.

1. In what capacity will you be answering this survey?
 - As an individual – my answers reflect my personal experience and opinions
 - As an organization – my answers represent my organization's experience and positions
 - Other: [COMMENT BOX]
2. Your answers to this survey will take as reference the practices of which organization? Please tell us the NAME of your organization:
[COMMENT BOX]
3. What category best describes your organization:
 - Public sector – City (Local Government)
 - Public sector – Municipal Transport Agency or Company
 - Public sector – Region or Province (Regional Government)



- Public sector – Regional Transport Authority
- Public sector – Regional Transport Operator
- Private Sector – Shared Mobility Operator [JUMP TO # 11]
- Private Sector – Third Party Data Aggregator [JUMP TO # 15]
- Private Sector – Transport Consultant [JUMP TO # 17]
- University or Research Institute [JUMP TO # 17]
- Other: [COMMENT BOX – JUMP TO # 17]

[SECTION # 3]

Your Public Organization

4. What is the name of the geographical area (e.g., city or region) covered by your organization’s jurisdiction or operations?
 - [COMMENT BOX]

5. To which Country does that geographical area belong?
 - [COMMENT BOX]

6. What are the responsibilities, or activities, of your Public organization in relation, specifically, to Shared Micro-Mobility services? (Please indicate all that apply)
 - Monitoring
 - Addressing through transport planning
 - Addressing through transport management
 - Developing regulations
 - Controlling access to the market
 - Collecting and managing data
 - Enforcing legal rules
 - Improving street infrastructure
 - Operating a Shared Micro-Mobility service
 - Other: [COMMENT BOX]
 - My organization does NOT have responsibilities or activities.

7. Presently, is there at least one Shared Micro-Mobility service operating in this area?
 - Yes
 - No [JUMP TO # Section 17]

[SECTION # 4]

What’s up?

In the following questions, please consider the geographical area (e.g., city or region) covered by the jurisdiction or operations of your organization.

8. Which Shared Micro-Mobility services are presently operating in this area? (Please indicate all that apply)
 - Bike sharing with fixed stations
 - Free-floating bike sharing
 - E-scooter sharing with fixed stations



- Free-floating e-scooter sharing
- Other: [COMMENT BOX]
-
- Are there any of these Shared Micro-Mobility services provided by an operator from the PRIVATE sector?
- Yes, all of them
- Yes, but not all of them
- No [JUMP TO # Section 17]

[SECTION # 5]

Sharing information?

Shared Micro-Mobility services usually generate digital data, which is stored by their operators. These digital data indicate the location of vehicles, their functional conditions, their use, etc.

These data can, in turn, be used to visualize, understand, and evaluate several aspects of the service. Operators can share this information with Public authorities in different ways.

9. Are PRIVATE Micro-Mobility operators sharing with your organization any information (maps, numbers or graphics, datasets, etc.) about their operations?
 - Yes, all of them
 - Yes, but not all of them
 - No [JUMP TO # Section 17]
 - I don't know [JUMP TO # Section 17]

[SECTION # 6]

Sharing datasets?

10. Is any one of those Private operators sharing digital datasets with raw data?
 - Yes, all of them
 - Yes, but not all of them
 - No [JUMP TO # Section 17]
 - I don't know [JUMP TO # Section 17]

[SECTION # 7]

About digital datasets

In the following questions, please consider ONLY the relationship with the PRIVATE operators who shared (or are sharing) with your organization digital datasets with raw data.

11. These datasets refer to what type(s) of service(s)? (Please indicate all that apply)
 - Bike sharing with fixed stations
 - Free-floating bike sharing



- E-scooter sharing with fixed stations
 - Free-floating e-scooter sharing
 - Other: [COMMENT BOX]
12. On what basis are these datasets shared with your organization? (Please indicate all that apply)
- Voluntary basis (e.g., they offered to do it)
 - Written agreement with no contractual force (e.g., memorandum of understanding)
 - To comply with contractual rules, permit or license conditions
 - To comply with Local or Regional regulations
 - To comply with National legislation
 - Other: [COMMENT BOX]
 - I don't know
13. How do Private operators provide these datasets? Please pick the option that best describes the current process.
- Directly to your organization
 - Indirectly, through another Public entity
 - Indirectly, through another Private entity
 - Other: [COMMENT BOX]
 - I don't know

[SECTION # 8]

Content, delay & format

We are well advanced in the survey questionnaire!

Next, some detailed questions about the sharing of datasets.

14. The digital datasets shared with your organization indicate what? (Please indicate all that apply)
- Fleet distribution (vehicles cannot be individualized)
 - Individual vehicle location
 - Individual vehicle status (e.g., free for use, disabled)
 - Individual trip origin and destination
 - Individual trip route
 - Other: [COMMENT BOX]
 - I don't know
15. Are these data shared in real time, or with a delay? By "delay", we mean time elapsed between the event and the access to its data. (Please indicate all that apply)
- Real time (with a delay inferior to 1 hour)
 - Short delay (between 1 hour and 48 hours)
 - Delivered in periodic packages (e.g., weekly, monthly datasets)
 - Other: [COMMENT BOX]
 - I don't know



16. Which data specification, or format, is used to share these data with your organization? (Please indicate all that apply)

- MDS (Mobility Data Specification)
- GBFS (General Bikeshare Feed Specification)
- Other: [COMMENT BOX]
- I don't know

17. Which data specification, or format, DO YOU CONSIDER the most APPROPRIATE to share these data with Public authorities?

- MDS (Mobility Data Specification)
- GBFS (General Bikeshare Feed Specification)
- Other: [COMMENT BOX]
- I don't know

[SECTION # 9]

Capacity & needs

The next questions ask you to assess your organization's CAPACITY and NEEDS to deal with data sharing. We know that answering these questions may require generic and subjective assessments. That's OK, because learning about current perceptions is also useful.

18. In general terms, does your organization have the necessary resources to deal with data sharing? Please indicate if you agree or disagree with each sentence, using a scale from 1 to 4, where "1" means "I fully disagree", and "4" means "I fully agree".

[GRID OPTIONS: 1 – Fully disagree, 2, 3, 4 – Fully agree]

- We have enough staff to manage the data
- We have enough staff to 'clean' the data (e.g. correct positioning errors)
- We have enough staff to analyze the data
- We have the necessary hardware
- We have the necessary software
- We have the necessary technical support
- We have clear procedures to ensure data privacy
- We have clear procedures for managing the database
- We have the know-how we need
- We have the capacity to do what we want with the data (in legal limits)

19. What are the main challenges raised by data sharing from Shared Micro-Mobility? Please indicate, from the list below, which are the most important for your organization.

- Cost of data collection and storage
- Volume of data can be very large and difficult to process
- Need to verify and correct errors (e.g., positioning errors)
- Different organizations have different data requirements
- Different organizations use different data specifications/ formats
- Difficulty of anonymizing mobility data
- Need of high levels of expertise data analysis and visualization
- Proprietary nature of mobility data



- Commercially sensitive nature of mobility data
- Privacy concerns (e.g., GDPR compliance)
- Other: [COMMENT BOX]

20. How could PRIVATE Shared Micro-Mobility operators make it easier for your organization to deal with data sharing?

- [COMMENT BOX]

[SECTION # 10]

Used for what?

21. Public organizations can use data from Shared Micro-Mobility for different purposes. In your organization, what has this shared data been used for? How often?

[GRID OPTIONS: I don't know, Never, Few times, Several times]

- Identify general mobility needs
- Understand how these services these services are being used
- Understand who is using these services
- Monitor modal shift (e.g., what trips are being replaced)
- Evaluate pilots to authorize or forbid operations
- Incentivize or discourage deployment of new services
- Monitor fleet size limits – to check respect of limits
- Monitor fleet distribution – to check balanced coverage
- Monitor service areas – to verify respect of no-go zones
- Monitor road safety (e.g., crashes)
- Create or expand dedicated parking
- Create or expand dedicated lanes
- Select areas to reduce posted speed limits
- Define or adjust geofencing limits
- Select areas to implement traffic calming measures
- Impound/Fine bikes and e-scooters incorrectly parked
- Collect damaged vehicles (e.g., vandalized)
- Identify priority areas for Police enforcement
- Develop curb management strategies
- Develop combined mobility partnerships with other operators
- Develop publicly subsidized use programs
- Inform policy development (e.g. reallocation of public space)
- Inform formal political discussions (e.g. City Council meeting)
- Inform formal public participation processes

[ALL JUMP TO Section # 17]

[SECTION # 11]

What's up?

In the following questions, please consider your activities as a whole.

22. Which Shared Micro-Mobility services is your organization presently operating? (Please indicate all that apply)



- Bike sharing with fixed stations
- Free-floating bike sharing
- E-scooter sharing with fixed stations
- Free-floating e-scooter sharing
- Other: [COMMENT BOX]

23. Is your organization sharing with PUBLIC authorities any information (maps, numbers or graphics, datasets, etc.) about your operations?

- Yes, everywhere
- Yes, but not everywhere
- No [JUMP TO # Section 17]
- I don't know [JUMP TO # Section 15]

[SECTION # 12]

Sharing raw data?

24. Is your organization sharing digital datasets with raw data with any Public authority?

- Yes
- No [JUMP TO Section # 17]

[SECTION # 13]

Datasets with raw data.

In the following questions, please consider all your data sharing practices with Public authorities, as a whole.

25. On what basis are these datasets shared with Public authorities? (Please indicate all that apply)

- Voluntary basis (e.g., they offered to do it)
- Written agreement with no contractual force (e.g., memorandum of understanding)
- To comply with contractual rules, permit or license conditions
- To comply with Local or Regional regulations
- To comply with National legislation
- Other: [COMMENT BOX]
- I don't know

26. How do you provide these datasets? (Please indicate all that apply)

- Directly to Public authorities
- To a third-party data aggregator
- Other: [COMMENT BOX]

[SECTION # 14]

Content, delay & format

We are well advanced in the survey questionnaire!

27. The digital datasets shared by your organization indicate what? (Please indicate all that apply)



- Fleet distribution (vehicles cannot be individualized)
 - Individual vehicle location
 - Individual vehicle status (e.g., free for use, disabled)
 - Individual trip origin and destination
 - Individual trip route
 - Other: [COMMENT BOX]
 - I don't know
28. Are these data shared in real time, or with a delay? By "delay", we mean time elapsed between the event and the access to its data. (Please indicate all that apply)
- Real time (with a delay inferior to 1 hour)
 - Short delay (between 1 hour and 48 hours)
 - Delivered in periodic packages (e.g., weekly, monthly datasets)
 - Other: [COMMENT BOX]
 - I don't know
29. Which data specification, or format, is used to share these data with Public authorities? (Please indicate all that apply)
- MDS (Mobility Data Specification)
 - GBFS (General Bikeshare Feed Specification)
 - Other: [COMMENT BOX]
 - I don't know
30. Which data specification, or format, DO YOU CONSIDER the most APPROPRIATE to share these data with Public authorities?
- MDS (Mobility Data Specification)
 - GBFS (General Bikeshare Feed Specification)
 - Other: [COMMENT BOX]
 - I don't know

[SECTION # 15]

Capacity & needs

The next questions ask you to assess your organization's CAPACITY and NEEDS to deal with data sharing. We know that answering these questions may require generic and subjective assessments. That's OK, because learning about current perceptions is also useful.

31. In general terms, does your organization have the necessary resources to deal with data sharing? Please indicate if you agree or disagree with each sentence, using a scale from 1 to 4, where "1" means "I fully disagree", and "4" means "I fully agree".
[GRID OPTIONS: 1, 2, 3, 4]
- We have enough staff to manage the data
 - We have enough staff to 'clean' the data (e.g. correct positioning errors)
 - We have enough staff to analyze the data
 - We have the necessary hardware
 - We have the necessary software



- We have the necessary IT support
 - We have clear procedures to ensure data privacy
 - We have clear procedures for managing the database
 - We have the know-how we need
 - We have the capacity to do what we want with the data (in legal limits)
32. What are the main challenges raised by data sharing from Shared Micro-Mobility? Please indicate, from the list below, which are the most important for your organization.
- Cost of data collection and storage
 - Volume of data can be very large and difficult to process
 - Need to verify and correct errors (e.g., positioning errors)
 - Different organizations have different data requirements
 - Different organizations use different data specifications/ formats
 - Difficulty of anonymizing mobility data
 - Need of high levels of expertise data analysis and visualization
 - Proprietary nature of mobility data
 - Commercially sensitive nature of mobility data
 - Privacy concerns (e.g., GDPR compliance)
 - Other: [COMMENT BOX]
33. How could PUBLIC authorities make it easier for your organization to deal with data sharing?
- [COMMENT BOX]

[SECTION # 16]

Used for what?

34. Public organizations can use data from Shared Micro-Mobility for different purposes. As far as you know, the data shared by your organization has been used for what? How often?
[GRID OPTIONS: I don't know, Never, Few times, Several times]
- Identify general mobility needs
 - Understand how these services are being used
 - Understand who is using these services
 - Monitor modal shift (e.g., what trips are being replaced)
 - Evaluate pilots to decide on deployment or expansion
 - Incentivize or discourage deployment of new services
 - Monitor fleet size limits – to check respect of limits
 - Monitor fleet distribution – to check balanced coverage
 - Monitor service areas – to verify respect of no-go zones
 - Monitor road safety (e.g., crashes)
 - Create or expand dedicated parking
 - Create or expand dedicated lanes
 - Select areas to reduce posted speed limits
 - Define or adjust geofencing limits
 - Select areas to implement traffic calming measures
 - Impound/Fine bikes and e-scooters incorrectly parked
 - Collect damaged vehicles (e.g., vandalized)



- Identify priority areas for Police enforcement
- Develop curb management strategies
- Develop combined mobility partnerships with other operators
- Develop publicly subsidized use programs
- Inform policy development (e.g. reallocation of public space)
- Inform formal political discussions (e.g. City Council meeting)
- Inform formal public participation processes

[SECTION # 17]

Higher-level outcomes

We are advancing well in the survey.

35. Data generated by Shared Micro-Mobility services can help Public Authorities achieve higher-level outcomes. HOW MUCH can data sharing help in each of the following outcomes? Please indicate the potential you perceive in a scale from 1 to 4, where "1" means "no potential", and "4" means "big potential".

[GRID OPTIONS: 1 – No potential, 2, 3, 4 – Big potential]

- Improve access to necessities, social mobility and quality of life
- Improve access to micro-mobility services, especially in underserved communities
- Facilitate access to micro-mobility vehicles, with a short walk
- Increase road safety for riders and residents of all ages and abilities
- Improve the infrastructure for riding and parking micro-mobility vehicles
- Reduce unsafe riding behaviors, and better understand safety incidents
- Ensure shared micro-mobility vehicles are safe and withstand use
- Reduce overall energy consumption by shared micro-mobility operations
- Accelerate the shift towards more energy efficient transport modes
- Minimize the negative environmental impacts of redistributing, and recharging vehicles
- Increase the lifespan of shared micro-mobility vehicles
- Increase understanding of how, where, and by whom these services are being used
- Increase the understanding and respect between riders, residents, and other road users

[SECTION # 18]

What else?

One final question, now looking BEYOND Shared Micro-Mobility services.

36. Other types of urban mobility and transport services could also share data with public authorities, and some already do. HOW MUCH can sharing data from these sources help improve urban mobility? Please indicate the potential you perceive, using a scale from 1 to 4, where "1" means "no potential", and "4" means "big potential".

[GRID OPTIONS: 1 – No potential, 2, 3, 4 – Big potential]

- Ride-hailing



- Taxi
- Free-floating car-sharing
- Station based car-sharing
- Free-floating motorcycle sharing
- Station based motorcycle sharing
- Deliveries of food (Uber Eats, Deliveroo etc.)
- Deliveries of mail and parcels (Post, DHL, etc.)
- Urban Freight (construction, b2b distribution, etc.)
- Utility companies (waste collection, maintenance services, etc.)

[SECTION # 19]

Last comments...?

37. Would you like to add any comment on the issues covered by this survey?

- [COMMENT BOX – MAY BE LEFT BLANK]

[SECTION # 20]

You've reached THE END of the survey :-)

38. If we need any clarification about your replies to this survey, can we contact you? If yes, please provide an E-MAIL address:

- [COMMENT BOX – MAY BE LEFT BLANK]

39. Would you like to receive the results of this survey? If yes, please provide an E-MAIL address:

- [COMMENT BOX – MAY BE LEFT BLANK]

===== END OF QUESTIONNAIRE =====



About POLIS

POLIS is the leading European network of cities and regions focusing on urban transport innovation. We cooperate to develop sustainable urban mobility solutions for the city of today and tomorrow. Polis draws its expertise from a network of decision makers, researchers, managers, and practitioners working in authorities at local and regional level across the European Union. Building on results developed in European projects and in thematic working groups that touch upon key transport challenges, we link innovation and public policy orientations on urban and regional mobility with European policy development.

POLIS has a **Working Group for Governance & Integration**, managed by Pedro Homem de Gouveia. For information and engagement, write to: pgouveia@polisnetwork.eu

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