



DELIVERABLE

D8.6 Updated Business and Exploitation Plan 2

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Every effort has been made to ensure that all statements and information contained herein are accurate, however the PoliVisu Project Partners accept no liability for any error or omission in the same.

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Executive Summary

PoliVisu is entering its final year of operation as a H2020 funded project and focus is shifting from piloting solutions to sustainability and scalability. This involves formulating paths for partners to work together to unlock new commercial opportunities and ensuring open and easy access to all the non-commercial outputs from the project. Results from the previous years' work include the development of four spin-off research projects in the field of data and policy making, as well as increased awareness and interest in the project outputs

The **non-commercial project outputs** designed to encourage Policy Makers and Urban Planner to use big data to support their policy making remain housed in the open-access Policy Visuals web-based Toolbox. Validation of the Toolbox approach has been further cemented by a focused survey (see Appendix B) and discussions with public servants which show that the number one item that will help them better use data for policy are real-life case studies featuring recognisable use cases. Building on this verification PoliVisu plans to build on the case studies from the Toolbox and turn them into human stories upon which a communication campaign to highlight the impact of the PoliVisu approach can be built. This approach is intended to broaden the reach of the results, through multi-level messages for different audience types and channels - from general messages for social media, to evidence based content for presentations and blogs, to deeper technical details reserved for white papers and academic papers. In addition, a long-term permanent home for the Toolbox will be sought so it can continue to be updated and provide relevant support after the end of the project.

Regarding the commercialisation potential of PoliVisu two working groups have been set up to turn the initial business models for the two innovative technical outputs into a reality.

- **Traffic Modeller:** A mathematical model of a cities or regions transport system with a web-based interface for simulating traffic predictions managed by Plan4All
- **WebGLayer:** Visual analysis of big historical data through interactive maps and charts (helping users to discover hotspots, risky areas etc.) managed by InnoConnect

The previous version of this plan reviewed the suitability of the GIS market for positioning PoliVisu's tools. However, stiff competition, advanced data storage requirements and lack of 'social good' angle convinced the Team to explore additional possibilities. This report therefore covers the potential of both the CivicTech and Smart City markets, which provide opportunities and barriers for each Tool.

The chosen business model for both products is a B2B one which smartly leverages the software and customer bases of additional PoliVisu partners. Licencing fees have been determined as the most appropriate revenue model and Consortium software owners are exploring integration between their products in order to offer enhanced, value-add services to existing customers. These talks will continue in more detail during the third year of the project and will result in multiple working contracts/arrangements between parties with agreements around revenue sharing. The current plan is to focus on expanding deployments in the Czech Republic and Flanders to gather more use cases and knowledge that will further refine the commercial offerings before expanding sales to other geographies.

A timeline of activities for both commercial and non-commercial activities is outlined at the end of this document providing a baseline project plan for the exploitation work during the third year of the project. The next version of the Business and Exploitation Plan will be made available in the last month of PoliVisu's H2020 operation which will outline the sustainability actions to be undertaken after initial funding has ceased.

Chapter 1: Introduction

This edition of Business and Exploitation Plan reports on activities and results achieved during the second exploitation wave. To recap, the PoliVisu exploitation strategy is organised around three waves that progress sequentially from year one to three. The first wave was launched at the start of the project and its aim was largely **exploratory** i.e. to get a broad view of the market (back then seen primarily through a GIS lens), to map all potential stakeholders (value network analysis), and to create a long-list of exploitable outcomes that these stakeholders might be interested in. This groundwork was instrumental in steering the development of the second **'implementation** wave' over the past year during which initial ideas were tested and refined based on feedback from prospective adopters. Besides pilots, this category includes new cities, public and private organisations, research bodies, NGOs and civil society groups from across Europe. Their needs, preferences and experiences will ultimately determine our final solution and, as such, are given special attention in this deliverable. By the time this document is published, the third and final wave will commence. The final phase is called **'acceleration'** because it's aim is to speed up the route to market by bringing PoliVisu, its concepts and tools closer to potential adopters. Planned activities for this stage include, among other things, the roll-out of a special training program and several Proofs of Concept to be implemented by cities that initially weren't part of the pilot network.

The report and plan is organised as follows

- *Chapter 2: Aims and Approach* provides a summary of project-level objectives and goals that partners (a) worked on in the previous year and (b) should expect to achieve in the final year. How the former were achieved, i.e. what methods and steps were taken, is described in a section on methodology.
- *Chapter 3: Updated Results* lists the main exploitable outputs with a particular focus on WebGLayer and Traffic Modeller as the primary vehicle for technical/commercial exploitation. All applicable IPRs are mentioned here and the non-commercial route is described as well.
- *Chapter 4: Market Research* introduces the concept of CivicTech and explains why PoliVisu has a better fit with this market rather than the GIS one. Market analysis (size, dynamics, barriers, drivers, competitors) is followed by the presentation of feedback from pilots and external stakeholders.
- *Chapter 5: Updated Exploitation Proposition* outlines tactics for improving the PoliVisu value offering through bettering positioning within CivicTech, greater focus on the most impactful visuals, development and nurturing of strategic partnerships
- *Chapter 6: Business Models and Commercialisation* includes an initial business plan for Traffic Modeller and WebGLayer
- *Chapter 7: Exploitation Pathway* provides the strategies and tactics for commercial and non-commercial exploitation along with a timeline of activities to be followed

The deliverable also has three appendixes. Appendix A provides an overview of PoliVisu training activities. Appendix B is a verbatim version of the online questionnaire¹ launched in September 2019. Appendix C is a landscape review of relevant or similar projects involving data and mobility policy.

¹ <https://forms.gle/w7PFZK9jcnrLYyEN9>

Chapter 2: Aims and Approach

2.1 Objectives Update

During the second year of operation PoliVisu remained an ambitious and innovative project that is attempting to turn the way public sector uses data to make and communicate policy decisions on its head. With an experienced policy making organisation at the helm as Coordinator, AIV, PoliVisu created conditions for its partners to:

- Develop innovative visualisations for key policy challenges (focused on urban planning and mobility)
- Gather feedback on the visualisations directly from policy makers
- Identify gaps in user needs to be fulfilled by the project

Moving into its final year as a H2020 project, the PoliVisu team wish to formulate a more refined exploitation plan focused on the sustainability of both commercial and non-commercial results. The goal for this exploitation plan now becomes both strategic and tactical. In essence, it provides a roadmap for the project in its final year, giving all partners a sense of purpose on how to:

- Formulate paths for partners to work together to unlock new opportunities
- Facilitate access of PoliVisu partner solutions to new markets
- Create optimum conditions for the wider commercialisation of results
- Ensure open and easy access to all the non-commercial outputs from the project
- Secure funding for spin-off research and development

By the end of next year, a final exploitation plan for the three years after initial funding ceases will be published, along with key messaging, product packaging and business models, as well as roles and responsibilities.

2.2 Methodology

As described in the previous version of this deliverable, exploitation research takes the form of three waves - Exploration, Implementation and Acceleration. The project is currently in the Implementation phase which involves building the clear strategy for exploiting commercial and non-commercial elements in its final year. Activities undertaken in the past twelve months to help build this strategy include:

Enhancing awareness of PoliVisu

- Participation in 16 conferences and events in 2019 up to the date of writing this deliverable, and 6 more events scheduled for the rest of 2019. This adds up to 22 conferences and events where PoliVisu was disseminated in one year.
- Messaging on social media

Understanding Potential Adopters Better

- Training policy makers on using the PoliVisu visualisations and soliciting feedback
- Understanding feedback from pilot deployments
- Policy maker survey

Discerning the potential of the Tools

- Original pilot activities
- New deployments
- State-of-the-Art review
- Clustering activities with other projects

Chapter 3: Updated Results

3.1 Exploitable Results Review

The main exploitable outcomes remain broadly the same as last year and comprise eight categories of ‘hard’ and ‘soft’ results. Six were identified in year one, one was created in the second year and one is planned for the final year. Hard results include visualisation tools, data, metadata and technical models; soft include original concepts, training material, case studies and the wider knowledge base for better policy making. All eight categories with the corresponding target audiences and potential exploitation channels are reviewed below.

1. **PoliVisu Policy Making Model:** The methodology/process to be followed for incorporating big data into the different stages of the traditional policy-making cycle. Helps potential users to understand what type of big data visualisations should be used at each stage and how they can be used for co-creation to deliver useful results (see D3.5 PoliVisu Policy Making Model).
 - *Potential Audience:* Public Sector decision makers and their stakeholders to be able to easily follow/understand the model. Standards bodies helping government and regulators make public policy (e.g. IEC, ISO and UNECE). Participation organisations wishing to engage people using big data and co-creation techniques (membership orgs, think tanks, researchers).
 - *Potential Exploitation Channels:* Ability to access through the Toolbox so visitors can explore the cycle based on their needs. Explainer videos. Published research papers. Presentations at appropriate conferences.

2. **Advanced Visualisations:** Visual representations using big and open data that allow policy makers and their stakeholders to drill down into data and better understand the problems and explore the impact of potential policy changes (e.g. closing a street or locating a service). Advanced visualisations need to be built by someone with data/programming skills. These experts could be members of the PoliVisu consortium or be customer’s own experts (see D3.6 Policy Experimentation & Functional Design 2).
 - *Potential Audience:* Public Sector decision makers and communication managers who wish to better share or explore mobility challenges and the impact of potential policy solutions, and engage stakeholders, are the primary audience. However, PoliVisu must consider citizens, media and researchers who can all also receive benefits.
 - *Potential Exploitation Channels:* Online access to a range of tools that can be used to create visualisations, as well as visualisation examples from pilots, through Toolbox (see below), new visualisation commissions may come through individual partners and advertising at conferences and events across Europe.

3. **Policy Ready Data & Metadata:** Metadata represent a common thread connecting data, policies, advanced visualisations, (traffic) models etc. A catalogue service through metadata enables a user to answer complex discovery-related queries, such as: “Which datasets, sensor measurements and traffic models can be used for a city of Antwerp to follow the European Noise Directive?” Moreover, such catalogue service may be connected to mainstream search engines like Google, Bing, Yahoo etc. Metadata thus acts as a bridge between the geospatial world and mainstream IT development (see Deliverables D4.2 Metadata specifications and D8.2 Standards White Paper ed. 1 for info).
 - *Potential Audience:* Tech Industry benefits from integration of geospatial and mainstream IT systems while advisors of Public Sector decision makers, citizens and researchers are the primary end users of catalogue service(s) capable of searching in a complex way.
 - *Potential Exploitation Channels:* Present geospatial data and metadata for mobility policy through (1) PoliVisu Catalogue based on OGC and W3C compliant services and (2) Google Rich Cards (advanced snippets).

4. **Policy Knowledge Base:** Information on specific mobility policies and best practices including visualisations that could be potentially adopted/replicated by other Public Sector users with similar challenges. Includes the outputs/results from the PoliVisu projects pilot sites (see D6.3 Policy Implementation & Compliance Report).
 - *Potential Audience:* Public Sector decision makers should be easily able to locate/find information that is relevant for them online (see Toolbox below)
 - *Potential Exploitation Channels:* City Managers should be easily able to locate/find information that is relevant for them via the PoliVisu Toolbox (see below).

5. **PoliVisu Training:** Support tools which help PoliVisu users understand the benefits of using big data for data-driven decision making. This will not be technical training on how to create a visualisation, it will be more focused on process/approach/business case for big data visualisations.
 - *Potential Audience:* Public Sector workers who wish to understand more about what big data is and the benefits of adding big data into the policy making process.
 - *Potential Exploitation Channels:* Training may take the form of Webinars, a short online course, and workshops at relevant European conferences.

6. **PoliVisu Toolbox:** Online portal that hosts all the outputs/results from PoliVisu with access to the tools and techniques which need to be adopted to create advanced visualizations for more effective/co-creative policy making. In addition, the Toolbox provides credibility for adopting the PoliVisu approach with stories/examples/case studies from the pilot cities, as well as research findings, published papers etc. (see D8.4 PoliVisu Playbox 1).
 - *Potential Audience:* Public Sector workers who wish to understand more about what big data is and the benefits of adding big data into the policy making process.
 - *Potential Exploitation Channels:* Training may take the form of live and recorded webinars, short online courses, and workshops at relevant European conferences, all promoted via social media and personal invitations to participants networks.

A new exploitable result that has been developed during the second year of operation is:

7. **Story Telling Modules:** This is a structured walk through a visualization explaining through text blocks its aim, why it was created and how to read the data and extract intelligence. The goal is to better help users understand how data and visualisations can be used in a policy context, by making the connections between the visual and the policy explicit.
 - *Potential Audience:* Policy teams who wish to understand more about how visualisations can be used for informing policy.
 - *Potential Exploitation Channels:* Inclusion in the Toolbox as part of/or replacing the pilot case studies. These will also be used as part of the training program and be distributed through our social media channels and networks.

In the final year of the project, PoliVisu will add one more exploitable result:

8. **PoliVisu Book:** Publishing a definitive go-to book on big data and policy making with chapter contributions from other similar projects and initiatives so the reader benefits from a wide source of results and lessons learned
 - *Potential Audience:* Anyone interested in big data and policy but primarily public sector decision makers
 - *Potential Exploitation Channels:* To be given away at Smart City Expo in Barcelona as part of PoliVisu's 'final' event, along with other conferences and will be made downloadable on the PoliVisu website, the Toolbox and via Open Access academic systems.

3.2 Commercial Results Update

The Consortium decided that the innovative products with the most commercial potential come out of exploitable product **(2) Advanced visualisations**. These two products are:

- **Traffic Modeller:** A mathematical model of a cities or regions transport system with a web-based interface for simulating traffic predictions
- **WebGLayer:** Visual analysis of big historical data through interactive maps and charts (helping users to discover hotspots, risky areas etc.)

As outlined in the previous exploitation plan, instead of creating a new joint business entity, PoliVisu intends to create an environment for multiple strategic business partnerships that will give the SME owners of PoliVisu's innovative commercial products the opportunity to grow their company and offering. By partnering with other PoliVisu organisations that provide different services/products within similar markets, PoliVisu provides each of its organisations with an opportunity to expand their product portfolio and reach new customers. The idea is to use these partnerships to strengthen weak aspects of businesses, share resources and even customers. Based upon informed Consortium discussions, the business models, approach and go-to-market strategy is outlined in chapter 6 of this document - Future Exploitation Plans.

3.3 Non-Commercial Results Update

Outside of the expected city pilot results, a number of new initiatives and research projects have been born from PoliVisu findings to-date.

- **Ile de France Smart Services²:** Consortium partner Issy Media in Issy les Moulineaux took knowledge generated by the PoliVisu project in its difficult quest to find and access data that was dispersed between different public and private bodies in the region and helped launched a new Smart City platform called "Ile de France Smart Services". The aim of the platform is to make it easier to create smart services by bringing together data that covers the whole of the Île de France including 2.5 million buildings in the Paris region, its infrastructures and networks, etc. The 3D map that covers 100% of the territory (12 000km²) will be enriched as the needs of the Paris Region are developed.
- **PoliRural³:** Consortium partner Plan4All developed a new H2020 policy making project but rather than focusing on map-based visualisations it uses systems dynamics to visualise/model a system and then explore potential policy impact through changes to the system. The aim is to create an inclusive learning environment where rural populations, researchers and policymakers come together to address common problems. Through its work PoliRural will leave decision makers at different levels of government better equipped to tackle existing and emerging rural challenges, rural populations more empowered and rural areas more resilient.
- **DUET⁴:** DUET (Digital Urban European Twins) is a brand-new innovation initiative from Consortium Lead Informatie Vlaanderen which leverages the advanced capabilities of cloud and high-performance computing (HPC), in the form of Digital Twins, to help public sector decision-making become more democratic and effective. Building on the data literacy findings from PoliVisu, DUET creates digital replicas of a city, so people, no matter their background, can use the Digital Twins interfaces for easy policy impact exploration and experimentation.
- **Mozambique:** Consortium partner Politecnico di Milano, took the work of PoliVisu and used it to win corporate social responsibility money from the university so it could help country of Mozambique better open data and use it for enhancing smart mobility.

² <https://smartidf.services/fr>

³ <https://polirural.eu/>

⁴ <https://www.digitalurbantwins.com/>

Chapter 4: Market Research

Before delving into business and exploitation plans, this chapter explores how PoliVisu will deliver impact through different market approaches.

4.1 Market Overview

4.1.1 GIS Market Update

Our previous version of the exploitation plan focused on the European GIS market. Its findings were clear that in order to compete in the competitive marketplace, PoliVisu would need to adapt itself to compete with other players. It would need to become more of a data processing and storage platform which is not within the project remit. In addition, from further research and conversations with policy makers, it became increasingly clear that the GIS sector was less likely to take and use PoliVisu tools for the social good it was envisioned to do. This divergence from i) the aims of the original call and ii) the initial vision for PoliVisu was deemed significant. As such, exploitation *solely* within the GIS sectors is not considered wise. To compensate for this fact, PoliVisu has looked at additional market's for it's outputs, where it can potentially be positioned as an eParticipation/CivicTech tool or Smart City enabler.

4.1.1 CivicTech Market

This young market is categorised by several different terms like e-participation, govtech, e-democracy and digital democracy. There are many reasons why PoliVisu falls into this market, the prime one being its original purpose and reason for creation – to deliver collaborative policy. This market is where new tools are being increasingly used to reinvigorate and improve citizen participation in democratic and collaborative decision making, with services tending to fall under one of four categories:

- **Governance services (transformation):** The majority of organisations fall into this category, providing services and tools to digitise public services and improve decision taking using collaborative tools.
- **Citizen autonomy (engagement):** This is the second most popular category with tools and platforms to empower citizens in direct democracy.
- **Data management (models):** This category involves collection, analysis and visualisation of data to help people better understand information and create more knowledgeable opinions, usually on real-time policies.
- **Common causes (support):** Involves supporting social causes and initiatives, especially in the most vulnerable communities.

PoliVisu, somewhat uniquely, cuts across many of these categories. Its tools, from traffic models to open source visualisation libraries, help cities make better, more informed transport decisions that affect hundreds of thousands of citizens. Some of them are vulnerable communities e.g. they live far away from transport infrastructure (transport poverty) or, conversely, too close to the main transport hub, therefore experiencing higher levels of congestion, pollution, noise, et cetera. Regardless of their situation, all citizens with basic devices and access to the internet can interact with PoliVisu visualisation and provide feedback on their experience, thus establishing a two-way communication channel with local government.

The tools in this market vary greatly and like PoliVisu, have often come from city administrations, government and civil society, including e-petitioning, e-consultations, e-voting, participatory budgeting and crowdsourcing. They all involve tapping into the wisdom of the crowd by making democracy more responsive, transparent and participatory. PoliVisu carries this ethos further by equipping both politicians and civil society with data-based evidence and intelligence in order **to inform their civic discourse**. PoliVisu solutions should be seen as an effective addition to governments' existing suite of eParticipation tools, beginning of course with transport and mobility policy.

Market Size

The civic tech market is hard to measure precisely. For one, there is no universal definition of ‘civic tech.’ Perhaps the most accurate definition is that civic tech is something that sits at the intersection of technology, government and society. For another, while the market may be young and relatively small, it encompasses a wide range of products and services that lack clearly defined boundaries. This results in overlaps with other industries (GIS, e-government, crowdfunding etc.), making accurate market analysis all the more difficult. Nevertheless, attempts to measure the state of play in civic tech had been made in the past.

In 2013, the Knight Foundation published a report⁵ in which the market was divided into two clusters: open government and community action. The former included tools for data access and transparency, data utility, decision making, resident feedback, mapping and visualization, and voting; the latter for civic crowdfunding, community organisation, information crowdsourcing, neighbourhood forums, and peer-to-peer sharing. The findings showed consistent high growth measured by the number of organisations in each cluster. Specifically, from 2008-2012 the market grew at an annual rate of 23%. Growth varied between clusters, with Community Action growing faster than Open Government.

The foundation also examined clusters by investment time. Somewhat intuitively, projects in the Open Government cluster that seek to advance government transparency, improve the accessibility of government data/services, and foster civic involvement in democratic processes were mostly supported through grant funding, whereas those falling under Community Action (e.g. P2P sharing, neighbourhood forums, civic crowdfunding) mostly attracted private capital.

Barriers

- (1) **Lack of Successful Business Models:** A core challenge for this market is that very few start-ups have meaningfully scaled up and achieved sustainable business models which are flexible enough to adapt to a rapidly changing public sector landscape. This is partly due to the fact that the market is still young, unregulated and unstable. Recent research⁶ claims that whilst the number of organisations created year-per-year in this sector is rising, most rely on grants, subsidies and investments to survive, with maybe 1 in 3 being financed by customer sales only. Therefore, a key focus of the year ahead must be addressing this issue by seeking out the sustainable business models that are beginning to emerge and learning from them.
- (2) **Bureaucratic Purchasing Processes:** The public sector is often dogged with lengthy buying cycles, complex bureaucratic processes and, as a whole, is quite resistant to change.
- (3) **Limited Customer Base:** While civic tech is about open government (i.e. GovTech), the size of potential market in terms of customers is limited to the number of local/public authorities present in the country/region. Take pilot countries, for instance. There are 606 registered cities and towns in Czech Republic, 66 cities in Flanders, 1276 communes in Île-de-France. While some may find the numbers impressive, these figures pale in comparison with the private market i.e. businesses, which reach almost 1M in le-de-France alone.⁷ This particular feature of GovTech market doesn't mean it's not worth entering. But industry players, especially newcomers, should bear this unique challenge in mind.

Competitors

There are many players in the CivicTech space, a selection of the most well-known across Europe are provided below:

⁵ <https://knightfoundation.org/features/civictech/>

⁶ Knight Foundation and Rita Allen Foundation (2017) “Scaling Civic Tech: Paths to a sustainable future.” <https://knightfoundation.org/features/civicttechbiz/#step-0>

⁷ <https://www.gouvernement.fr/en/20-facts-and-figures-that-show-just-how-much-the-ile-de-france-region-has-to-offer>

<i>Competitor Name</i>	<i>About</i>	<i>Business Model</i>
MySociety	mySociety is a social enterprise, based in the UK and working internationally. They build online technologies that give people the power to get things changed and share these technologies so that they can be used anywhere.	Not-for-Profit social enterprise funded by National and local government as well as by US foundations.
Mapillary	Mapillary is a global network of contributors who are working together to build better maps. Anyone can join and collect street-level images, using simple tools like smartphones or personal cameras. With computer vision, it connects images across time and space to create immersive street-level views and extract map data.	For profit. Offers commercial licenses to imagery and machine-extracted data, private hosting, and ArcGIS tools
DSI4EU	Digital Social Innovation provided a network of organisations and repository of case studies and funding opportunities for digital social innovation.	Funded by H2020 grant money, as DSI and previously as DeScale. Project funding ended in June 2019.
TechSoup Europe	TechSoup is a network of 24 partner organisations serving a community of over 435 000 civil society organisations in the region equipping them with transformative technology products, knowledge, and services so they may benefit from technology and make social change.	Not-for-profit, receiving a mixture of grants, consultancy, code reviewing and training/hackathon events.
Fluicity	Fluicity deals with the crisis of trust between citizens and politicians through an app that brings to life citizens' projects and ideas by enabling a dialogue between elected officials and citizens.	Private, for profit, business - currently only cities in France and Belgium
Novoville	Novoville is a citizen engagement platform operating in 40 cities across Europe. Citizens are provided with an app through which they can apply for services, report problems, and, most importantly, share their opinions. This information feeds through in real-time dashboard controlled by the council.t.	Private for profit, set up with seed funding.

It is interesting to note that most of the competitors in this space focus on high level data visualisation dashboards but not the deep dive data exploration and predictions provided by PoliVisu tools. It may be interesting to talk to existing CivicTech providers and understand the fit they see with PoliVisu. Could PoliVisu's tools be offered/integrated/re-sold through these providers?

PoliVisu CivicTech Market Conclusions: Whilst the emerging CivicTech market feels like a natural fit because of PoliVisu's aims and tools (especially the giveback nature of the Toolbox and the social good element of WebGLayer), being able to make money commercially can be tenuous and potentially a long time coming so the project and its partners may need to (a) continue to explore GIS and Smart City market options and (b) rely on both a mix of public and grant money in the short to medium term.

4.1.2 Smart Cities Market (Mobility)

There is money in the smart cities market. Currently valued, according to Mordor Intelligence, at 475 billion Euros it is expected to reach a value of 1,303 billion Euros by 2024 at a CAGR of 18.30% over the

forecast period⁸. It is also a fast-growing market. More and more cities are using Internet-of-things (IoT) solutions and platforms to bring together large amounts of city data and use knowledge and visuals to monitor city infrastructures, managing everything from traffic flows, safety and parking to water and air quality. Cities using these kinds of tools can also use them to take the new data and use it to tackle longer-term planning decisions focused on mobility and environmental sustainability as per PoliVisu aims. Therefore, there is wide opportunity for PoliVisu to support the growth of smarter cities with its policy making model, case studies and other relevant outputs. For cities who have not yet invested in costly IoT platforms, PoliVisu commercial tools provide a great entry point into this world.

The smart city concept branches out into many directions of which mobility is one. Others include governance, energy, infrastructure, healthcare and buildings, to name just a few but they all overlap with each other to some degree. The smart mobility segment is strongly associated with Intelligent Transport Systems (ITS) that promote integrated, multimodal and low-emission mobility solutions. This market has witnessed a remarkable growth over the past few decades, reaching \$6 billion globally in 2016 according to some estimates.⁹ The main drivers behind this development are ICT enabled web, mobile and big data applications that challenge traditional players and business models with disruptive service offerings e.g. MaaS, MoD, Info mobility (more on them below).

Faced with this challenge, mobility service providers in the public and private sectors have started to innovate to keep pace with reality. European public transport systems are actively using new tools and data sources to provide better travel experiences through real time information, route optimisation, digital ticketing etc. Car sharing schemes continue to grow exponentially across Europe. Although some of the longest and most successful brands originated in the US (e.g. Zipcar), Europe now represents over half of the global car sharing market with six million users and a fleet of over 70,000 cars.¹⁰

Citizen demands for greater flexibility combined with market opportunities resulting from public-private cooperation have created a fertile ground for the emergence of Mobility as a Service. In fact, Europe now has more MaaS initiatives than any other part of the world.¹¹ Some of the best-known examples include WienMobil (AT),¹² Whim (FI),¹³ UbiGo (SE).¹⁴

MaaS is often seen as a precursor of Mobility on Demand which takes mobility concept to the next level. The two are similar in that both leverage emerging mobility services, integrated transit networks, real time data and the other elements of the wider ITS to provide a more traveller-centric transport offering. But whereas some services within MaaS are fixed (e.g. public bus), MoD adjusts service provision according to traveller needs. For instance, users can request to be picked up or dropped off at any point along the route using an app that communicates with the bus driver. As such, MoD is proving to be particularly popular in remote areas and/or during night hours.¹⁵

It is clear that mobility landscape is changing fast. Unable to rise to the challenge, old business models and narrow definitions are giving way to broader, more inclusive and sustainable concepts. One such concept - Sustainable Urban Mobility Plan (SUMP)¹⁶ - was recently introduced by the European

⁸ <https://www.mordorintelligence.com/industry-reports/smart-cities-market>

⁹ <http://www.climateaction.org/news/global-smart-urban-mobility-market-to-hit-25bn-by-2024>

¹⁰ <https://www2.deloitte.com/uk/en/pages/manufacturing/articles/car-sharing-in-europe.html>

¹¹ <https://maas-alliance.eu/maas-in-action/>

¹² <https://www.wienerlinien.at/eportal3/ep/channelView.do/pageTypeld/66533/channelId/-3600061>

¹³ <https://whimapp.com/>

¹⁴ <https://www.ubigo.me/>

¹⁵ <https://www.intelligenttransport.com/transport-articles/72098/how-why-bus-sector-innovate/>

¹⁶ <https://www.eltis.org/mobility-plans/sump-guidelines>

Commission in a bid to make urban transport system more accessible, balanced, attractive, safe, sustainable and future-proof.

Market Size

It is hard to find consistent data on the size of smart mobility market in Europe. According to one source, it was worth \$757 million back in 2015, and was projected to double by 2020.¹⁷ Another source, a French study,¹⁸ claims that national smart mobility market is worth €4.5 billion annually, a considerable difference compared to the first statistic which ostensibly measures the whole of Europe. According to research commissioned by the Transport Systems Catapult in 2014, the Intelligent Mobility market was estimated to grow from its annual value of around £140 billion to just over £900 billion a year by 2025.¹⁹ Different concepts and methods used by various studies make it difficult to say with confidence how big exactly is European let alone international smart mobility market. However, one common thread that emerges from existing research is that Europe is in the vanguard of innovation. From real-time traffic management to congestion charging to low-emissions zones, Europe occupies a leading position in advanced ITS adoption²⁰ which is driven significantly by changes in the mobility itself. As mentioned previously, traveller preferences are moving toward more personalised, flexible, on-demand services, so smart mobility is increasingly about how to use digital technologies to seamlessly manage a user journey end-to-end.

Today, over 3,000 start-ups operate in Europe's smart mobility market.²¹ 717 of these offer services such as P2P car sharing, carpooling, car rental, ride-hailing and MaaS. 221 start-up's are tackling the problem of inner-city parking, with offerings ranging from road-side and vehicle-based solutions to smart sensors. By helping drivers find available parking spaces more effortlessly and faster, these companies are helping cities become more connected, efficient and ultimately less congested. Others concern info-mobility providing data and insights to help make better decisions.

Government pledges to invest in transport are likely to make smart mobility even more attractive for startups. In October 2019, the European Commission launched a call worth €1.4 billion to support key transport projects through the Connecting Europe Facility, the EU's central funding instrument for infrastructure networks. The investment will help build missing connections across the continent, while focusing on sustainable transport modes.²²

Barriers

Despite these efforts, effective government policies, especially at local level, are lagging behind. Technology has made it possible for the private sector to create profitable business models. However, because the private sector often starts innovating without a specific regulatory framework being in place, existing policies, if not updated, soon become unfit for accommodating new/disruptive mobility solutions (think of Uber and the challenges it faced in cities the world over).

Even when the right framework is put in place at, say, local level, compliance issues may occur if no changes to regional or national policies are introduced. As synchronisation takes time, the whole process can become very time consuming, which is a disadvantage in a fast-moving market.

Another challenge concerns the market itself. Although 3,000 start-up's may seem a lot, many companies were excluded from the sample because they stayed on the market for two years or less. Despite a

¹⁷ <https://www.statista.com/statistics/279589/size-of-the-european-smart-transport-market/>

¹⁸ <https://www.plateforme-attractivite.com/en/toolbox/>

¹⁹ <https://ts.catapult.org.uk/intelligent-mobility/market-breakdown/>

²⁰ <https://parksmart.gbci.org/navigant-reports-how-innovative-mobility-solutions-lead-smart-cities>

²¹ <https://urbanmobilitydaily.com/the-european-mobility-startup-landscape/>

²² https://ec.europa.eu/transport/themes/infrastructure/news/2019-10-16-cef_en

massive injection of VC (Venture Capital) funding, many mobility start-up's are learning the hard way that transportation profits are elusive. Uber is still making billions worth of losses every quarter. Uber's rival Lyft is in a slightly "better" position; its losses were \$644 million.²³

With mounting losses and no concrete proof of long-term profitability, the idea of a profitable smart mobility tech company may look like a mirage to some. The market therefore needs to be flexible enough to adapt itself and participants have yet to design a business model that can be self-sufficient in the long run.

Competitors

The PoliVisu annual review ended with a recommendation from our Reviewers that the project needs to take a closer look at innovations happening now in the field of Big Data and Transport policy to (a) ensure we are progressing beyond the state-of-the-art and (b) to take and leverage good practices. Initial research identified 23 smart city innovation projects (see Appendix C). The landscape is truly diverse in terms of solutions providers. The existence of companies, projects and initiatives offering 'soft' tools provides some reassurance that there is demand for case studies, training material etc. all of which form an important part of the Toolbox. On a different note, one interesting discovery that emerged from competitor analysis is the growing use of cycling data in urban planning. PoliVisu will consider cycling data alongside other sources its pilots currently use (e.g. sensors, ANPR, floating car data) in traffic models to make urban policy making even more evidence based. Another relevant finding has direct implications for the sustainability of visualisation tools like WebGLayer. At present, it is mostly used for analysis and prediction using historic sensor data. With some adjustments, the tool could be improved to do the same based on real time information. If implemented, the change would increase WebGLayer's attractiveness to potential customers, who are increasingly challenged to make informed decisions in real time.

PoliVisu Smart City Market Conclusions: Unlike GovTech, smart mobility market features lower levels of government-citizen interaction. It is mostly driven and shaped by evolving consumer preferences, on the one hand, and private sector innovation, on the other. Although PPPs are not uncommon in this market, government's role is largely regulatory, and it can either stifle or stimulate innovation depending on vested interests, political will, safety and social justice considerations, among other things (Uber example again comes to mind). Smart mobility market is also less about policy visualisations than service offerings that citizens can use in their everyday life, such as annual MaaS subscription or a routing app. While undoubtedly relevant, smart mobility market per se does not necessarily have the best fit with PoliVisu's value proposition, which has public authorities as the primary target group. Having said that, smart cities cannot function without data, and policy makers need to make sense of their city data in order to help this concept become a reality. This is where PoliVisu can help. By providing insights into citizens' travel patterns through advanced visualisations, PoliVisu indirectly contributes to the creation of smart transport system, one in which mobility services are co-designed by multiple stakeholders based on real evidence.

4.1.3 Cross-Market Drivers

Open Government drivers: Several factors drive forward the Open Government movement/market. First, government institutions the world over are under pressure from civil society to create more open, accountable services for all. As a result, public administrations slowly but steadily abandon the culture of working behind closed doors in favour of more transparent approaches that promote trust between policy makers and citizens. Second, new digital tools offer higher quality service than legacy systems, leading to a better user experience. Authorities that are serious about improving their performance metrics invest in easy-to-use crowdsourcing technology to better understand and incorporate citizen insight in various

²³ <https://www.curbed.com/2019/8/9/20798955/uber-lyft-bird-ipo-earnings-call-micromobility-profit>

stages of policy making, from design to delivery. Third, private enterprises, NGOs, community groups and other non-governmental stakeholders can create new, value-added products and services based on government assets. TransportAPI²⁴ is one example of successful data analytics and aggregation business built around open transport data.

Transport policy drivers: Aside from general engagement, PoliVisu specialises in a particular industry - transport and mobility. This niche according to Forbes is a good thing because many VCs are becoming increasingly interested in vertical software as these types of companies can create better products that reflect the needs of a specific community better than anyone else. As European transport policy is at an exciting time, there are opportunities for PoliVisu to leverage these drivers, which are characterised by

- **Shift to holistic approaches:** There is a need for transport policy to be more collaborative and holistic as the mobility ecosystem increases in complexity
- **Greater focus on sustainability:** A shift to zero and low-carbon solutions increased the need for integrated policies that pull different public and private actors together to work on decarbonisation
- **New integrated transport models:** Concepts such as Mobility as a Service (MaaS) and other connected transport solutions offer opportunities for the roll out of innovative new business models

PoliVisu Conclusions: Transport policy has evolved to include more ambitious objectives than simply helping people get from A to B. Today, a smart transport policy is one that can spur innovation, protect the environment and increase trust in government processes while at the same time making travel more effortless, enjoyable and affordable for all. PoliVisu will leverage these drivers of change in its messaging to potential adopters, explaining how its tools can help decision makers deliver transport and mobility policies fit for the 21st century.

4.2 Customer & Pilots' Insights

Following the exploitation plan for Y2 outlined in the previous version of this deliverable, PoliVisu took several concrete steps to better align its future offering with the expectations of potential customers. These were identified as:

- **Public sector:** This group includes not just decision makers - that is, people in power with the ability to influence policy - but also (a) support staff who use different tools to generate evidence upon which policy measures can be adopted, and (b) those within administrations who need to communicate with the general public on a regular basis i.e. communications staff.
- **Civil society:** To this category belong various groups and communities that seek to promote specific interests through campaign work, advocacy, lobbying etc. Examples include cycling charities, road safety groups, transport unions.
- **Research:** Here we can find representatives of the research community coming from universities, think-tanks, private institutes, media organisations and consultancies, among many others. As such, stakeholders in this group include academics, journalists, citizen scientists, independent consultants and research managers affiliated with different organisations that work on topics of relevance to PoliVisu i.e. transport, mobility, data driven policy making, GIS, civic tech.

For commercialisation purposes, public sector actors were deemed the primary target customers so the project undertook three distinct tasks to better understand their wants/needs: (i) conducting hands-on workshops with policy makers at major conferences, (ii) gathering stakeholder feedback via pan-European

²⁴ <https://www.transportapi.com/>

survey, (iii) talking to pilots, who also qualify as potential customers due to their embeddedness into the local policy structures, about their plans for PoliVisu post-project.

4.2.1 Training Feedback

Public sector stakeholders were engaged during two specialised hands-on workshops that took place in Vienna and Venice (see Appendix A for a more detailed overview). On the conference stand, hundreds of stakeholders were interacted with, and around 40 stakeholders attended the voluntary workshops, selecting PoliVisu from multiple other simultaneous tracks. During the workshop’s participants were asked to undertake a variety of exercises using PoliVisu’s visualisations and provide feedback on the experience and the visuals themselves. Using Mentimeter, an interactive presentation tool, important feedback was gathered to stimulate group conversation.

Ninety percent of participants struggled to access the big data they need for policy making. When questioned further about the reasons for this and asked to rank some predetermined answers they chose the ‘lack of clear purpose’ as the primary reason, followed by lack of internal skills and the high cost of procuring big data. The answers not highly surprising since they had volunteered to come to a workshop to help build their capacity to use big data for policy making but helped reinforce PoliVisu’s data literacy aim.

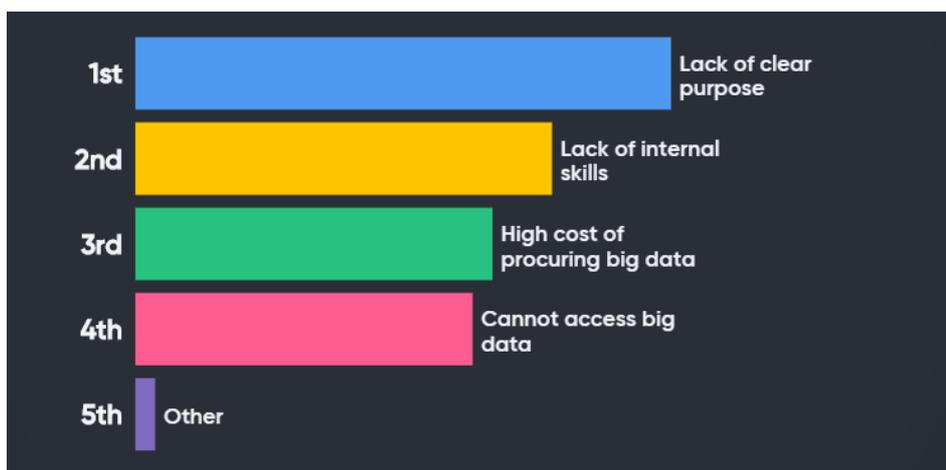


Figure 1. What are your reasons for not using big data?

When asked what would help participants to use big data for policy making, only a few participants volunteered ideas. The results fell into one of two broader categories (1) Real case studies and training, and (2) Regulations. The conversation segwayed into PoliVisu’s Policy Visuals Toolbox showcasing the case studies and policy elements that could provide help and inspiration.

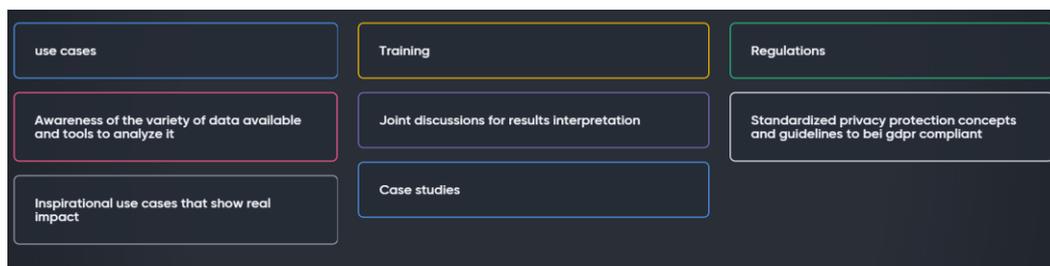


Figure 2. What could help you use (big) data for policy making?

Explaining that the PoliVisu team wanted the Policy Visuals Toolbox to be a central repository of inspiration, help and access to resources for using big data in policy, the Team asked if there are any other city initiatives that could serve as a best practice example of using big data for policy. Participants

struggled to come up with any answers. Only one example was finally given - Estonia and the Xroad initiative.

In conclusion, the hands-on-events provided clear feedback for improving the policy visualisations and demonstrated a strong needs for PoliVisu’s case study approach to supporting data literacy. However, the results were skewed to non-commercial outputs. In order to better understand the commercial aspects, the Consortium decided to undertake a pan-European survey.

4.2.2 Pan-European Survey

PoliVisu launched an online survey to gain an understanding of how public, private and third sector organisations use collaborative, data-driven policy making to achieve their objectives, and better understand what tools they are using and preferred business models. To that end, a list of 20 questions (see Appendix B) was developed by 21c in cooperation with AIV, Polimi, pilot partners and external experts.

To maximise the response rate, the survey team deployed a multi-pronged strategy which included direct outreach via email, promotion on social media (Facebook, Twitter, LinkedIn), via newsletter and a word of mouth. PoliVisu received it's target of 51 responses, all of which have been aggregated and anonymised so that no individuals can be identified from the answers given. The main findings are presented below.

Geographic spread

The survey was actively promoted for about a month. During this period, we received 51 responses from 19 countries, of which two were outside Europe (Israel, India). On a per-country basis, most responses came from the Czech Republic (9), Greece (5), Belgium (4) and Ireland (4).

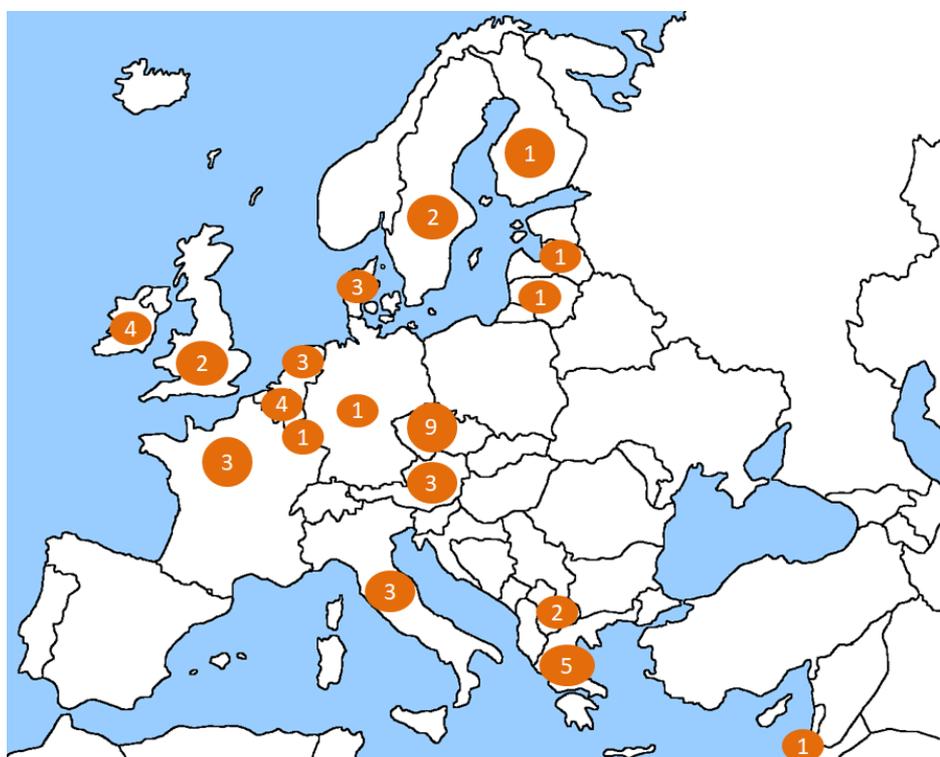


Figure 3. Geographic spread of survey responses

Participant background

Participant background was established by asking two questions: What organisation are you from? And what is your role in the organisation? Answers to the first question contained very specific names which we later categorised as either public, private, research or other. Out of 51 responses, 30 came from public authorities, 15 from private companies, 4 from research institutions and 2 from other organisations. Participants' roles broadly correspond to the four main categories: mayor, elected official, politician, councillor, advisor, consultant (public); CEO, managing director, president, manager, associate (private); academic staff, project leader (research); trade unionist (other). PoliVisu was pleased to attract some high-profile politicians and civil servants in answering the survey.



Figure 4: A word cloud of respondents' roles

Given the focus on GovTech and Smart City markets, public authorities occupy a special place in our exploitation strategy. For that reason, the research team was keen to get a better understanding of which public authorities answered the questionnaire. Upon closer inspection, we identified seven types of actors that characterise Europe's diverse public sector landscape. Among the respondents we found municipalities, cities, regions, state owned enterprises, provinces, county councils, one agency and one commune.

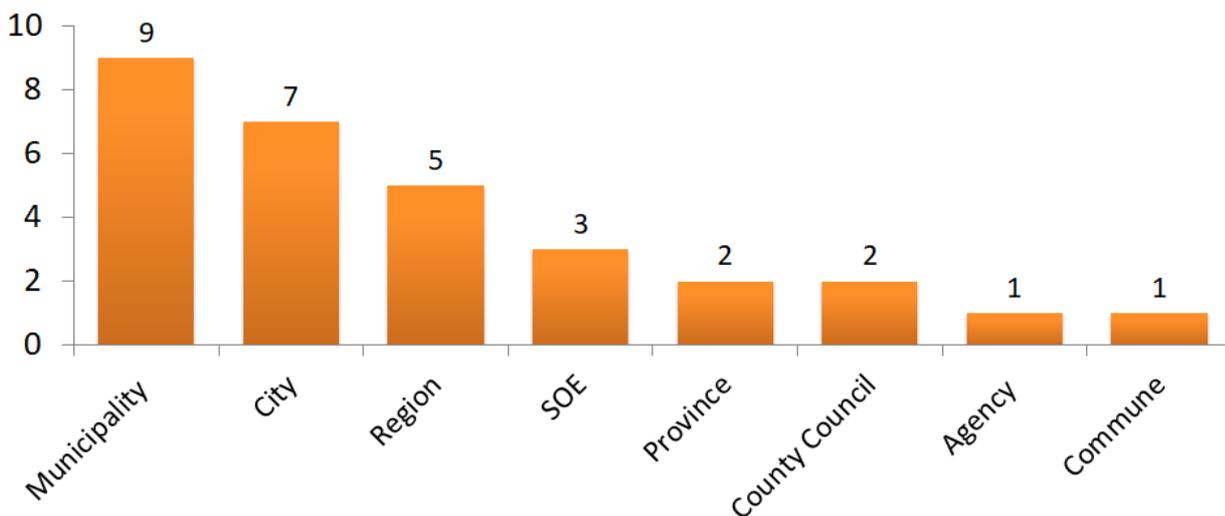


Figure 5: Public sector split

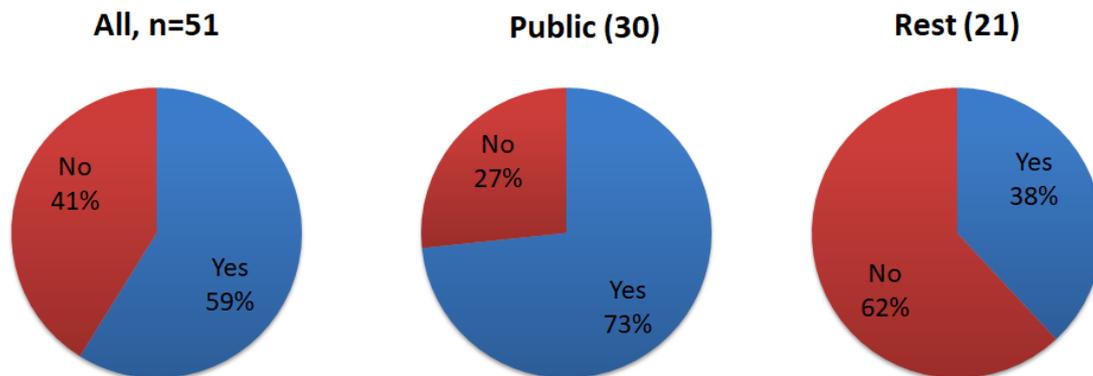
Having described the general characteristics of survey respondents, it is now time to proceed to the analysis of main findings. There are three main parts to be discussed: 1) participants' involvement in transport decision making, 2) the degree of collaboration and co-creation present in policy making, and 3) use of data driven evidence in policy processes. As we wanted to understand how different participants

responded to questions, we provide a separate breakdown for public and all the other participants (labelled as 'rest') in addition to the totals for all respondents.

Part 1: Participant's involvement in transport decision making

Questions in this section ask participants about their involvement in transport decision making to determine their relevance for PoliVisu.

Q1.1) Are you involved, either directly or indirectly, in policy decisions concerning transport and mobility?



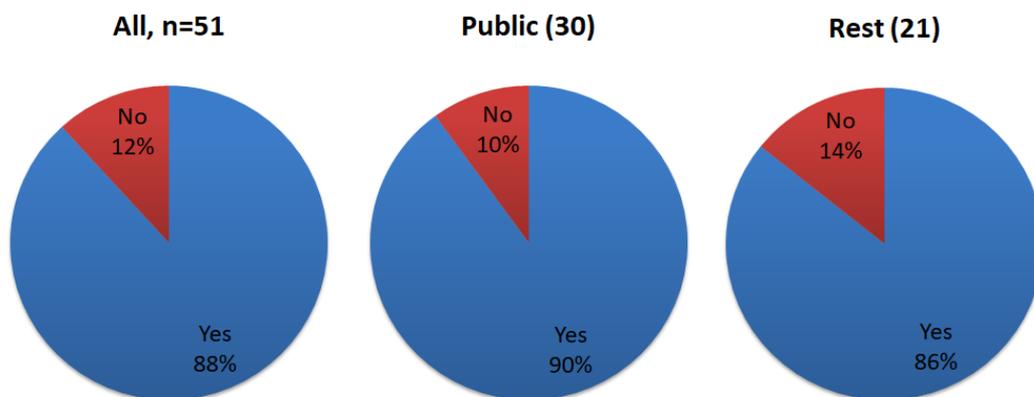
This question was answered by all 51 participants, with almost two thirds saying yes. When we look at just public sector respondents, that share is much higher (73%). However, when this category is excluded, the share of people involved in transport becomes considerably lower (38%).

Those who answered yes to the previous question had an option to provide more details about their involvement. Almost half (48.1%) mentioned strategic planning. A quarter (25.9%) said they are involved in the design and innovation of new solutions. The smallest shares are found in transport and infrastructure projects (7.4%), and in real time traffic management (3.7%).

Part 2: The degree of collaboration and co-creation present in policy making

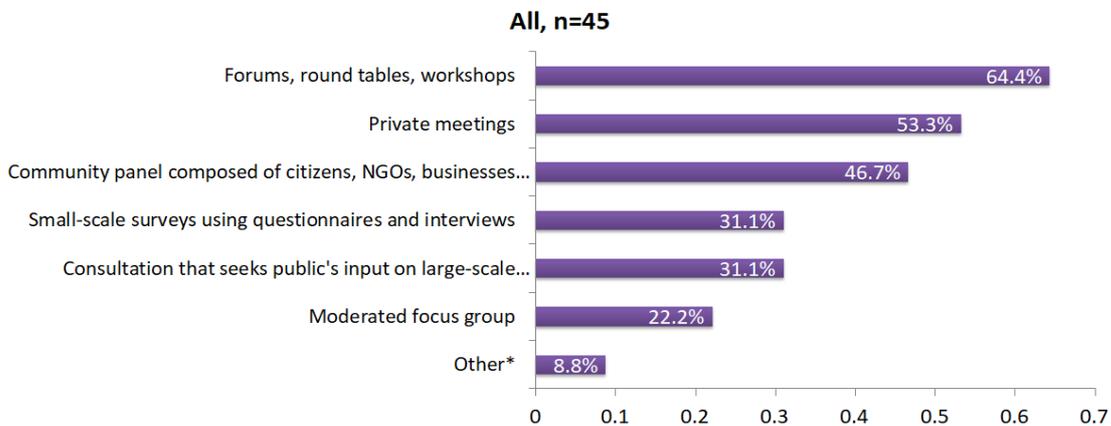
In this part, we wanted to find out whether respondents involve third parties in decision making and, if so, how? What do third parties think of it? Additionally, we explored challenges facing collaborative decision making and how best to address them.

Q2.1) Do you involve third parties in decision making processes?

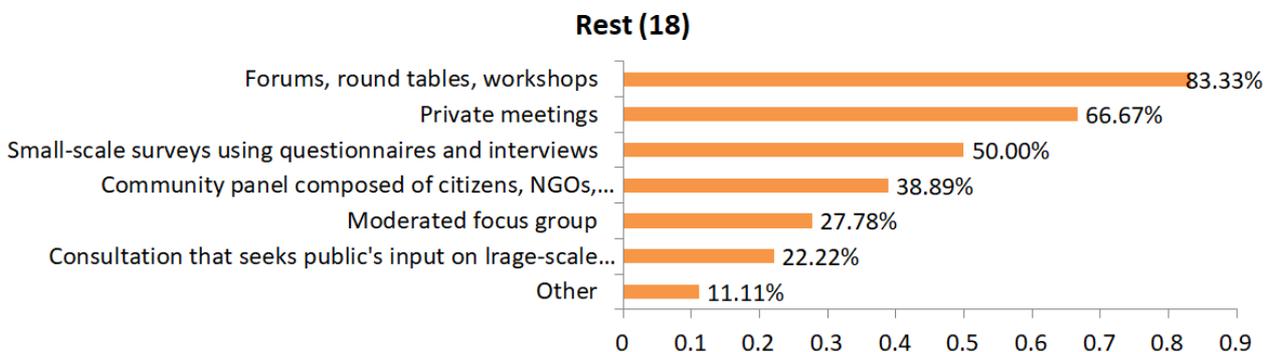
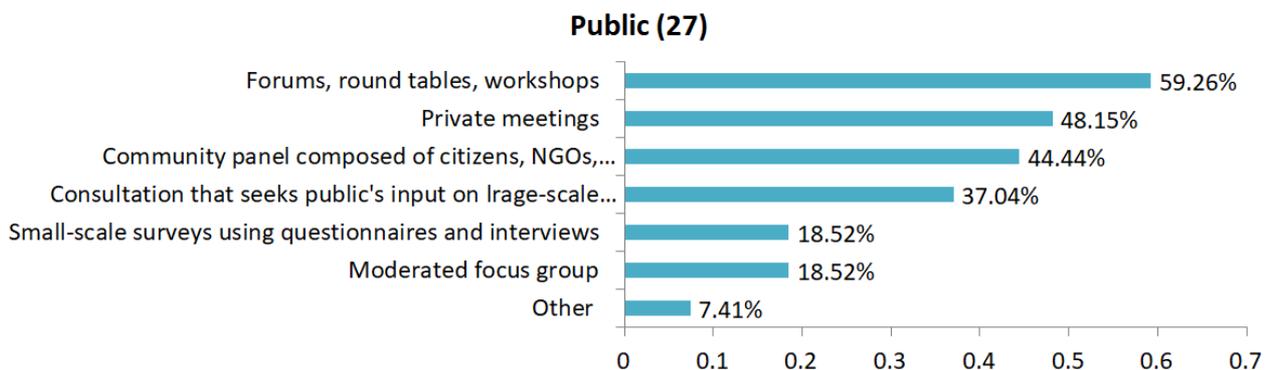


The vast majority of respondents engage external stakeholders to support policy making, especially in the public sector.

Q2.2) How do you involve third parties in your current decision-making process?

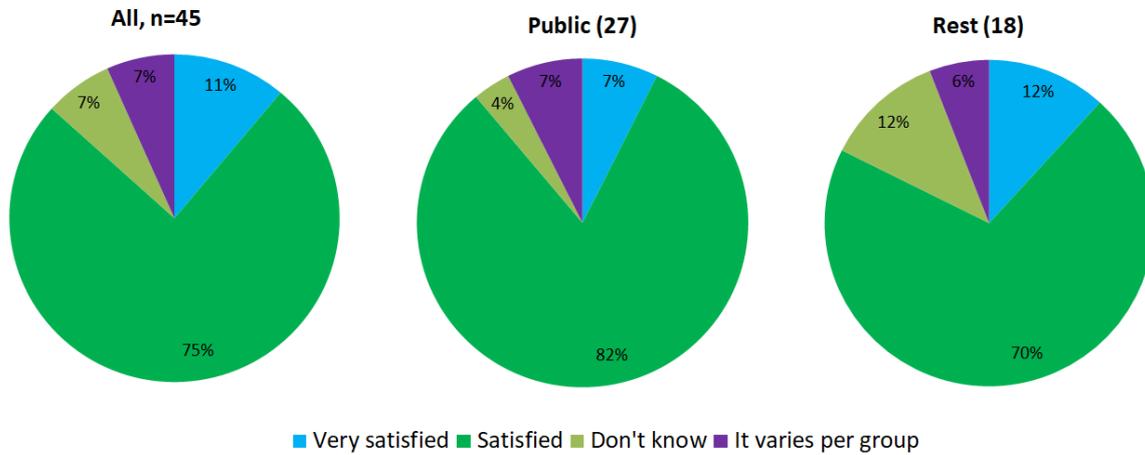


Based on the answers received, forums, round tables and workshops are the most popular means of engaging third parties. This is followed by private meetings, community panels, surveys, consultations and focus groups. Some forms of engagement are unique to specific respondents and are captured in the other option e.g. public meetings at a City Hall, foresight initiatives, experiments.



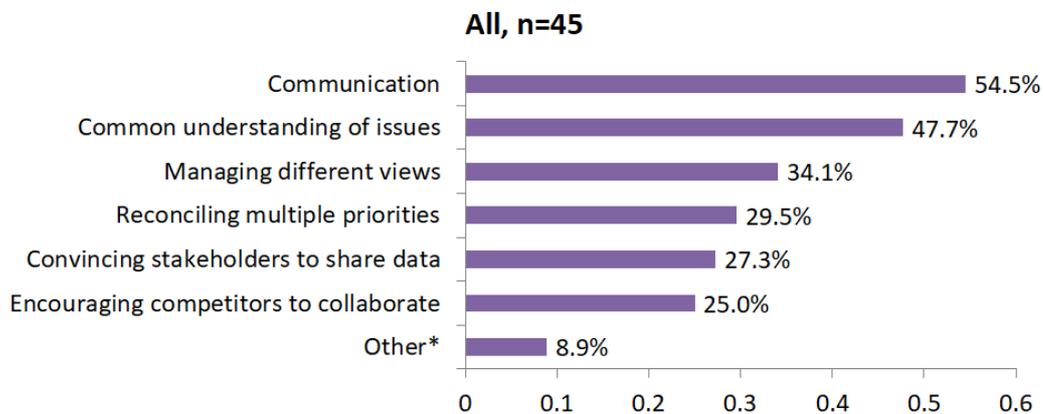
It appears that public stakeholders use similar means of engagement as respondents from other categories. The most popular tactics in both groups are forums, round tables, workshops and private meetings. Some minor differences are observed in the use of community panels and consultations (more popular with public stakeholders), and small-scale surveys and focus groups (more popular with all others).

Q2.3) Overall, how satisfied do you think your stakeholders are with your current process?

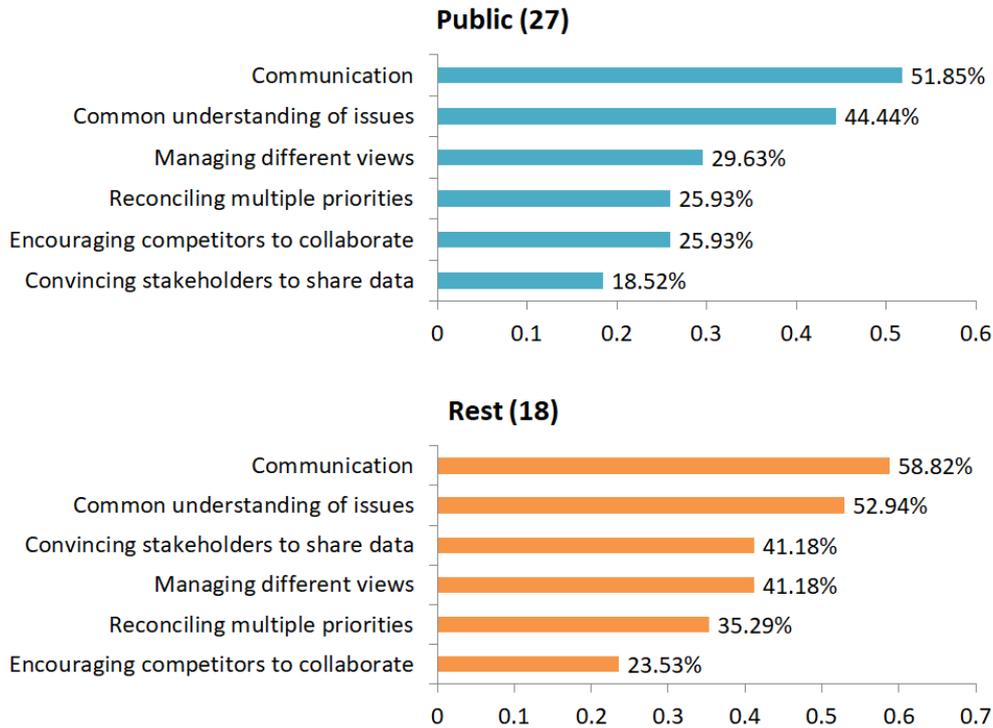


One interesting observation from the survey is that most respondents believe their third parties are happy with how collaborative policy making is being implemented. As many as 89% of public respondents think external stakeholders are either satisfied or very satisfied with the current process. At 82%, the share among private, research and other respondents is somewhat smaller but still impressively high.

Q2.4) What's your biggest challenge in collaborative decision making?

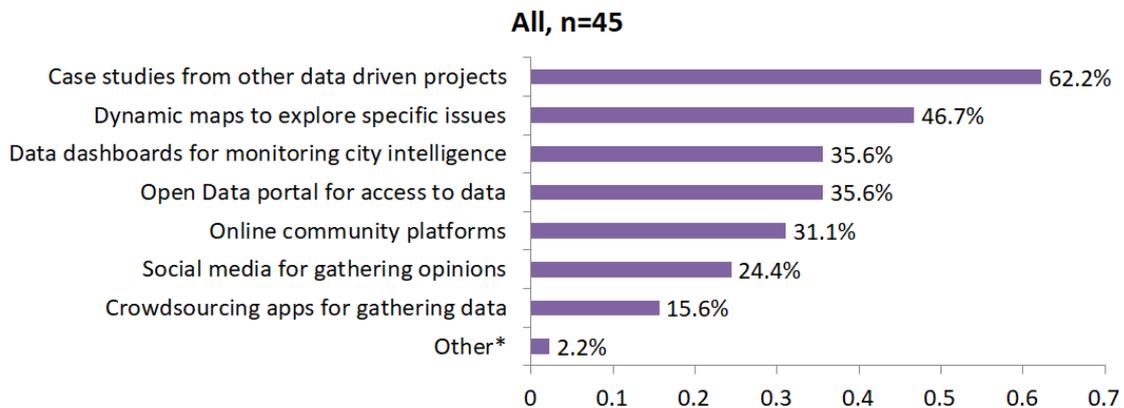


More than half of respondents who answered this question marked communication as the biggest challenge impeding collaborative policy making. The inability to reach a common understanding of issues is not far behind - it was deemed the biggest challenge by 47.7% of respondents. In third place we have the struggle associated with managing different views (34.1%). This is followed by the difficulty with reconciling multiple priorities (29.5%), with convincing stakeholders to share data (27.3%) and with encouraging competitors to collaborate (25%). Some said that national government is a problem, while others find it challenging to get an accurate representation of society.

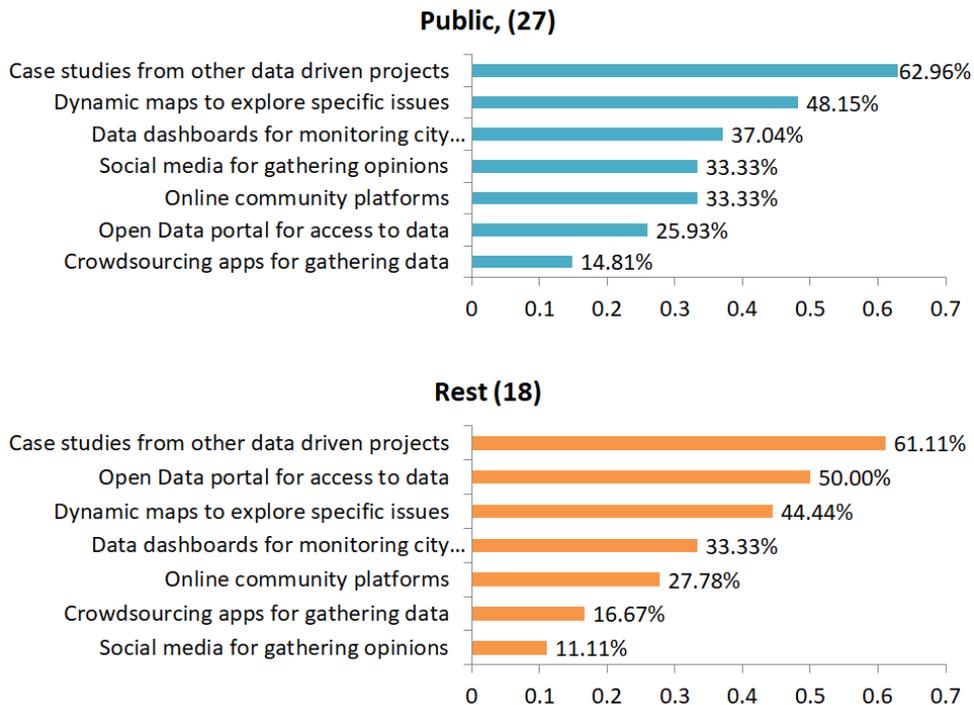


Looking at the split between the two main groups, we find that both see eye to eye when it comes to communication and a common understanding of issues. But when it comes to convincing stakeholders to share data, this becomes more of an issue for private, research and other respondents than for the public ones.

Q2.5) What kind of tools could help you make better, more collaborative policy decisions?



The last question of the section focused on tools for supporting collaborative policy making. Our preconceived assumption was that most respondents will select a technology-driven solution like maps or a dashboard. However, to our big surprise, it was case studies - in other words, a 'soft' tool - that most respondents were interested in, not maps, dashboards, portals, platforms or apps, although some of these were also quite popular.

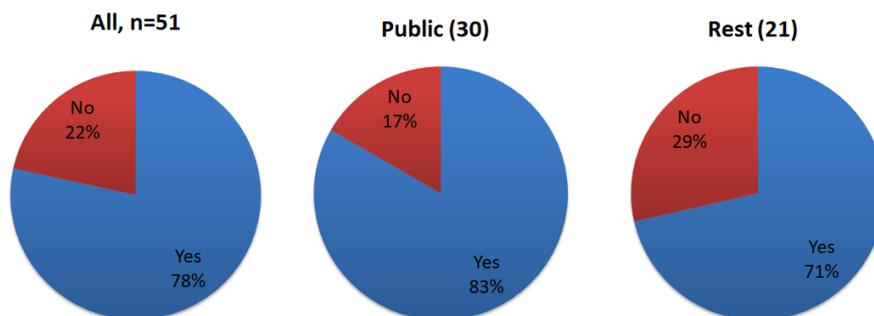


The demand for case studies was strong among both public and non-public respondents. One noticeable difference concerns social media, toward which public respondents exhibit a stronger preference. Another interesting observation concerns Open Data portals. While half of non-public respondents see them as an important tool, only a quarter of the public ones think Open Data portals can help make policy making more collaborative. This difference could be explained by the demand for open data which is usually stronger at societal level. It is often private companies, SMEs, research institutions, media organisations and citizen groups who experience a need for open data, which is increasingly seen as an enabler of innovation, transparency, social welfare and efficiency gains, to name just a few benefits.

Part 3: Use of data driven evidence in policy process

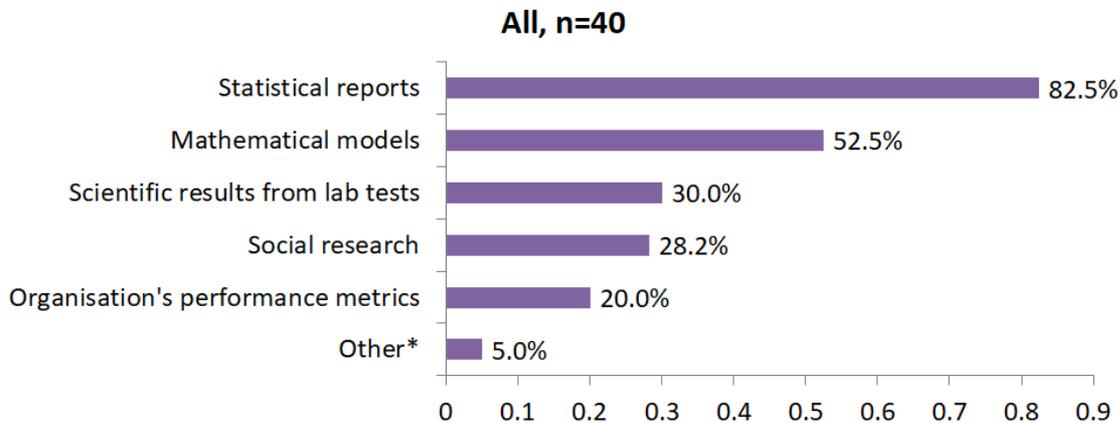
In the final part, we shift our focus from co-creation to evidence-based policy making. First, we explore whether participants use data driven evidence to make and communicate decisions. Our main goal here is to understand what types of evidence are being used and whether there are any significant differences between public and non-public respondents. We then narrow our focus to visualisations as a variant of data driven evidence. In the last few questions we gather information on the different tools used for policy visualisations, on people/departments responsible for transport related visualisations, and on business models that may entice participants to use a policy visualisation tool.

Q3.1) Do you use data-driven evidence to help make and communicate decisions?

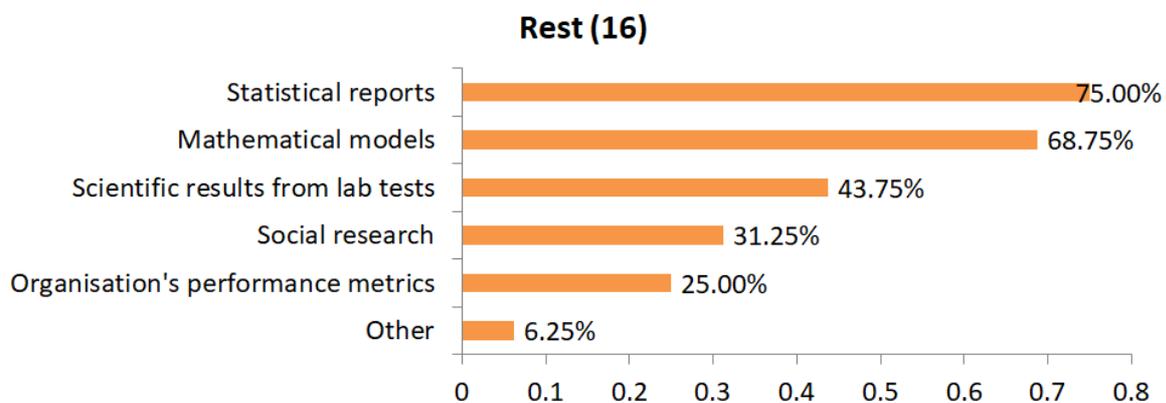
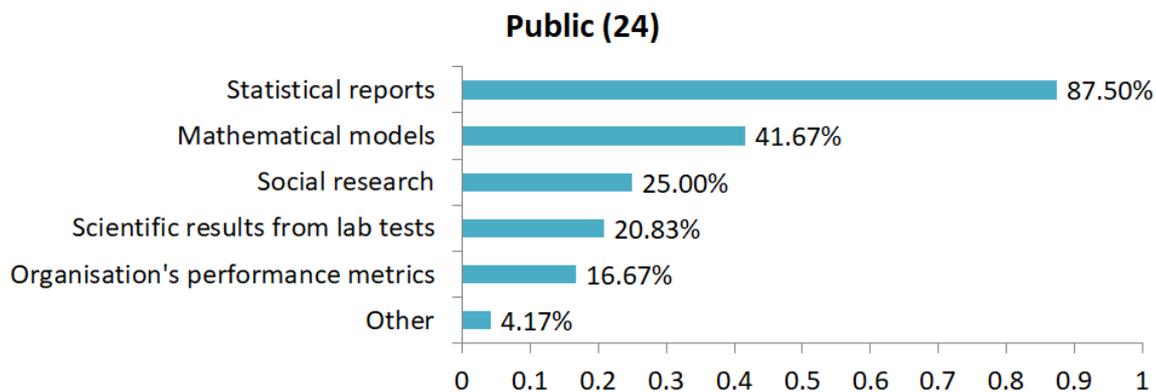


The vast majority of respondents said they use data driven evidence to make and communicate decisions. 83% of all public respondents use data driven evidence, which is higher than the average.

Q3.2) What data-driven evidence do you use for decision making?



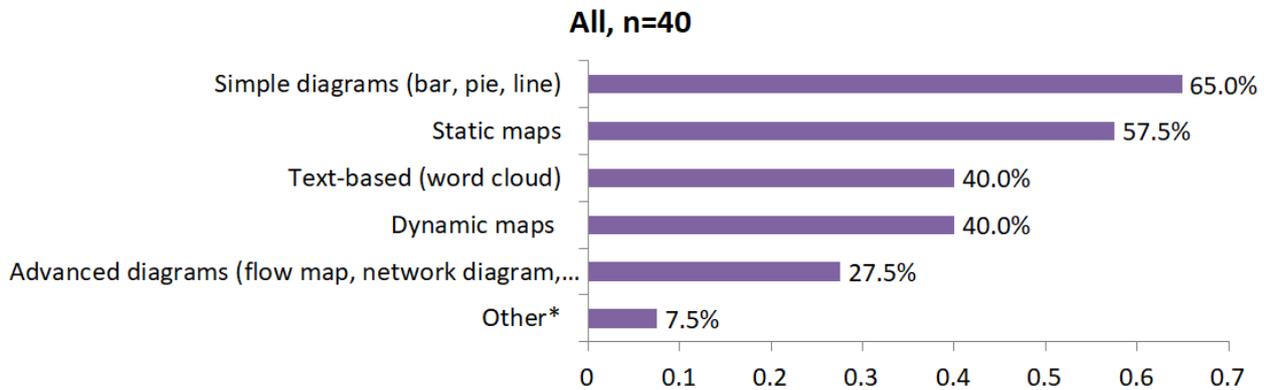
Statistical reports are the most popular form of evidence among those who answered this question. They are used by 82.5% respondents. The second most popular type of evidence is mathematical models (52.5%), which is followed by lab tests (30%), social research (28.2%) and KPIs (20%). In the 'other' category, we have two additional answers: London Datastore and satellite images.



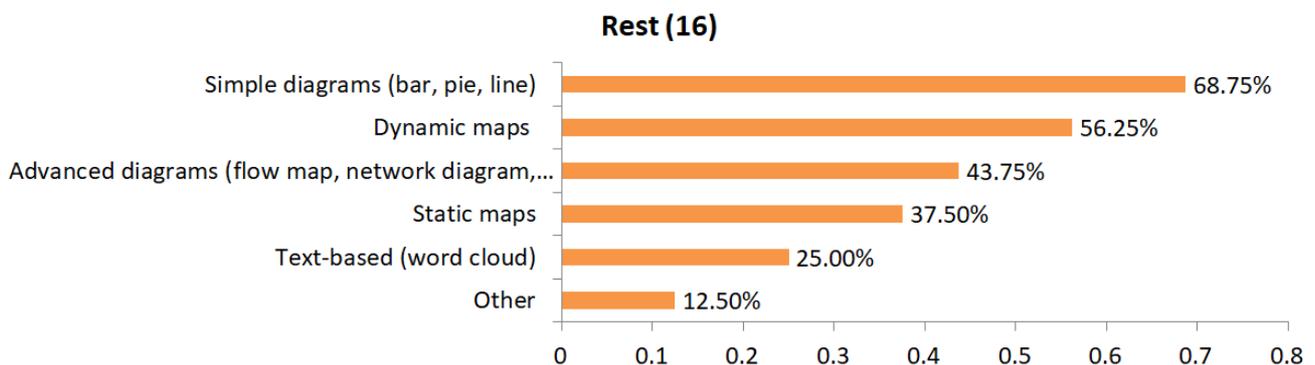
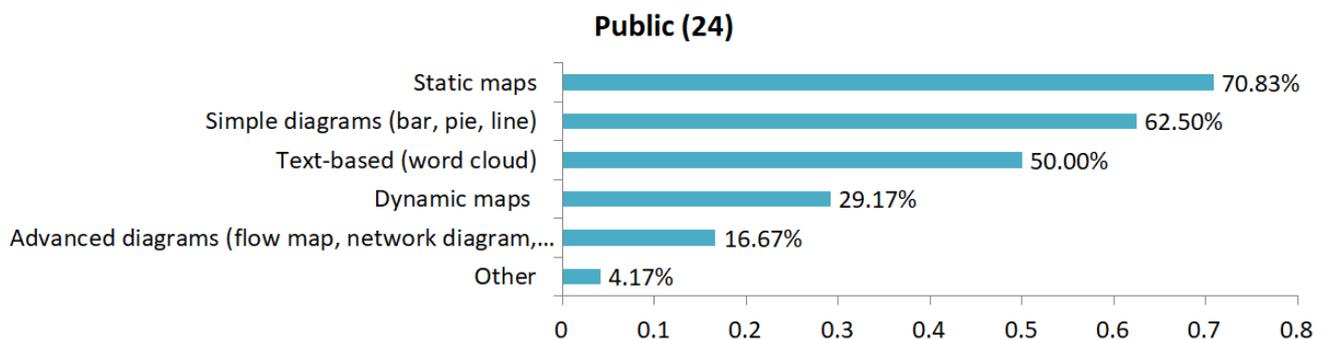
Looking at the split between public and non-public respondents, we find that statistical reports and mathematical models are the two most popular forms of evidence in both groups. When it comes to other evidence types, however, scientific results are more of a priority for the non-public group which includes

research institutions. This group also has a higher share of respondents who use social research and KPIs as evidence for decision making.

Q3.3) What visualisations, if any, do you use to inform and communicate your decision making?

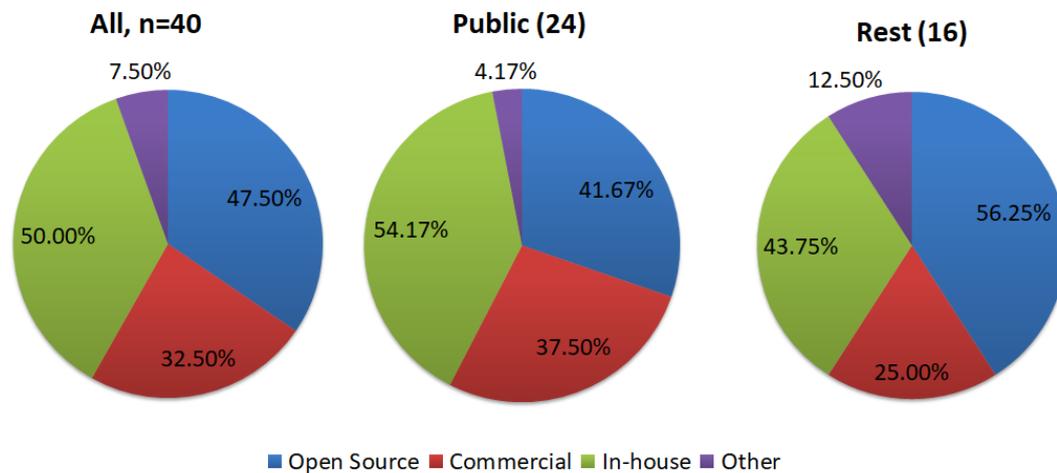


This question yielded results that truly surprised our team. Our initial assumption was that advanced diagrams and dynamic maps will be the most popular visualisations. But it turned out that less advanced types are more widely used e.g. simple diagrams (65%), static maps (57.5%).



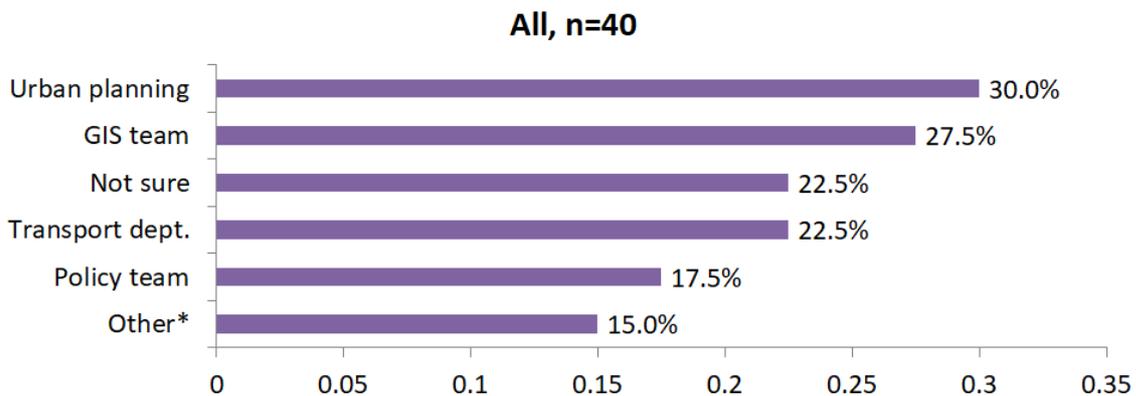
Simple diagrams are the most popular option among non-public respondents and the second most popular option among public ones. Static maps is the most popular visualisation among public stakeholders, who also make less use of dynamic maps and advanced diagrams than respondents from the private sector and research.

Q3.4) What tools do you use for policy visualisations?

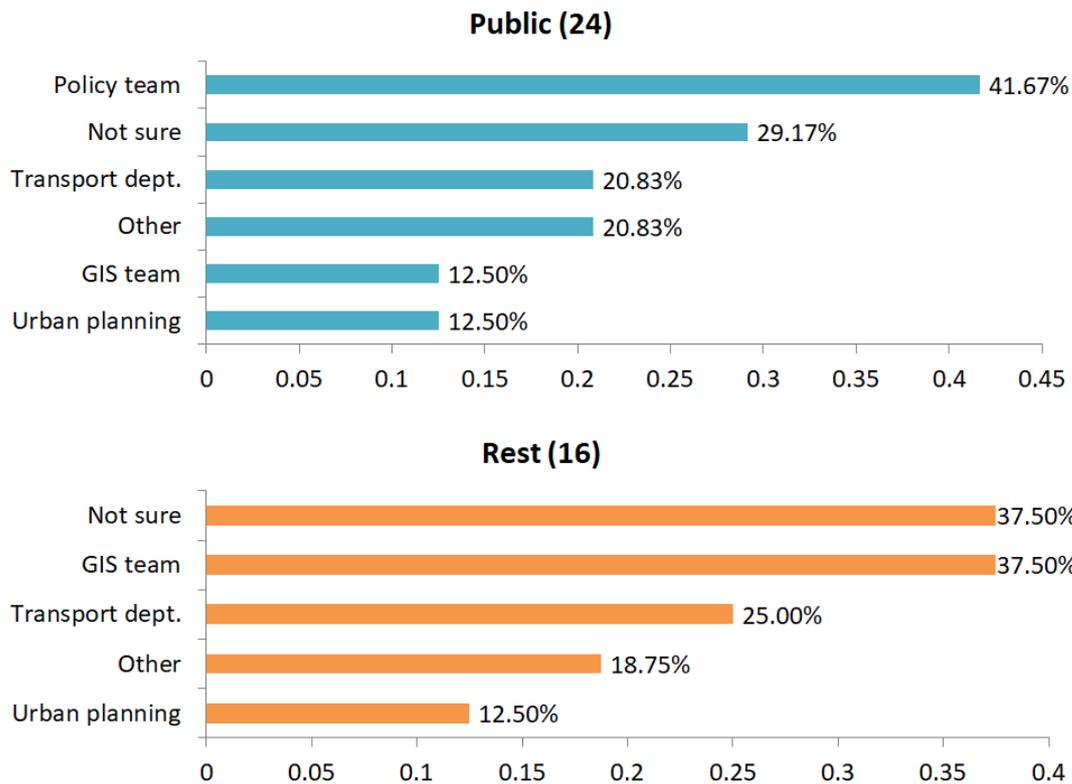


When it comes to visualisation tools, the most popular options are in-house solutions and open source technologies. The former are used by 54.2% of public and 56.3% of non-public respondents.

Q3.5) Where would responsibility for managing transport and mobility visualisations lie in your organisation?

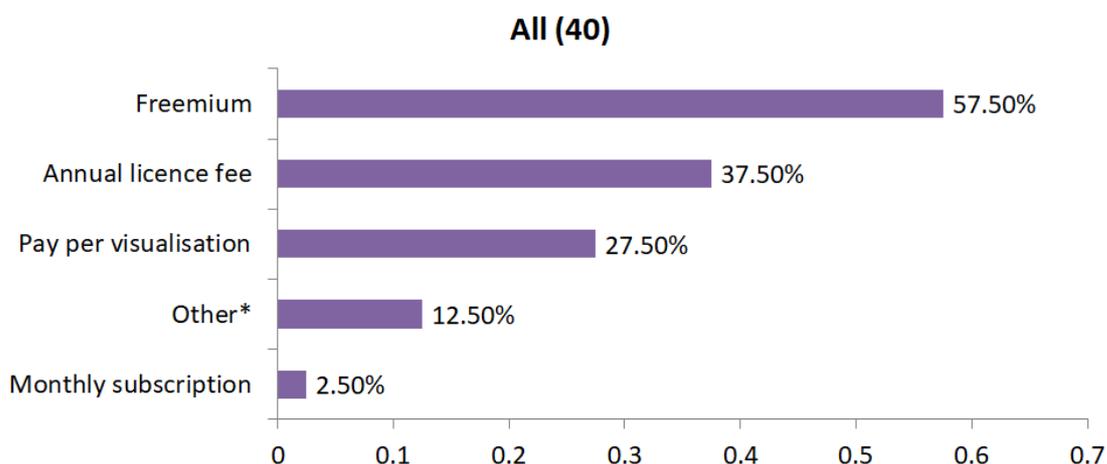


Based on the answers received, it is hard to establish with confidence who exactly is responsible for managing transport visualisations. No option received a majority. A third of respondents mentioned urban planning, 27.5% said it's the GIS team. Almost a quarter are simply not sure. Transport department received as many answers, while policy team received less still (17.5%).

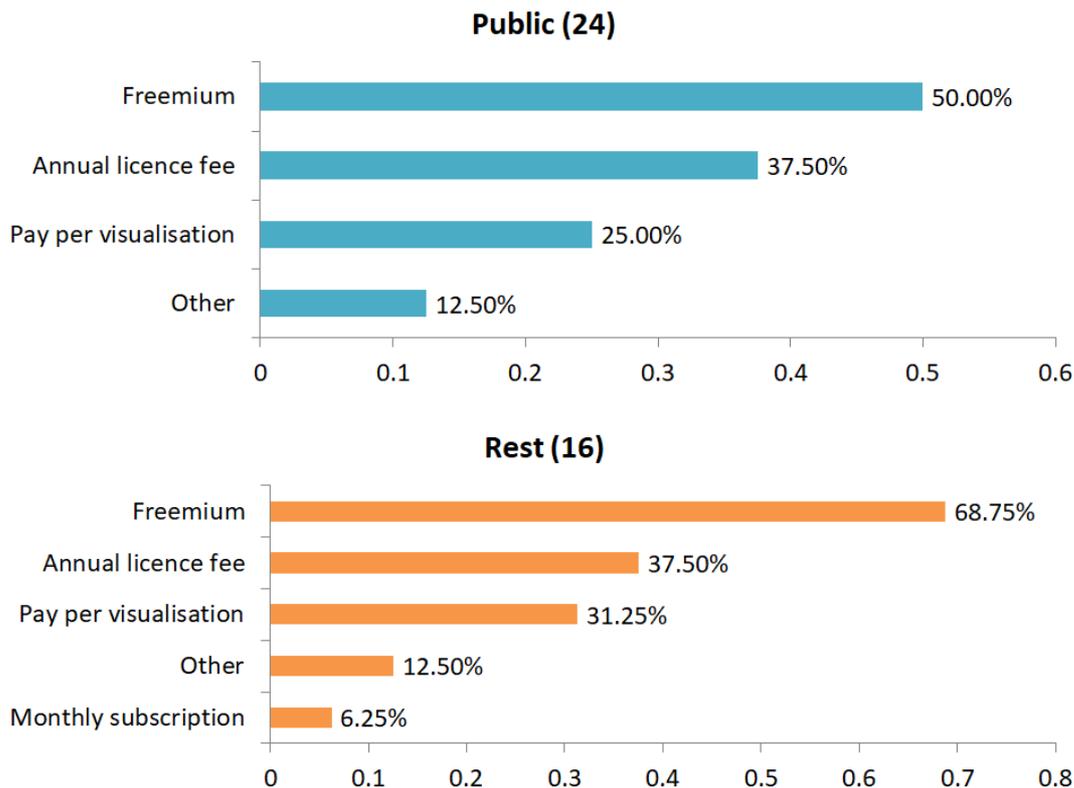


When looking at public and non-public responses, one striking observation is that almost a third of the former and more than a third (37.5%) of the latter are not sure where the responsibility lies. Having said that, 42% of public respondents mentioned policy team, the most popular option in this group.

Q3.6) What kind of business model would encourage you to use a policy visualisation tool?



In our final question, a clear majority emerged for the freemium option (57.5%). Next popular answers were annual license fee (37.5%) and pay per use (27.5%). Only one responded ticked monthly subscription.



We observe the same distribution of answers at the level of individual groups, with freemium, annual license fee and pay per use being the most appealing models for public and non-public respondents alike.

Conclusions: Despite its modest sample size, the survey provided valuable insights for shaping our exploitation approach as PoliVisu prepares to enter its final year as an EU project. From the findings we learned that

- Public sector landscape is very diverse even at the level of local authorities. Here we can find municipalities, cities, provinces, communes and counties each with its unique structure and budget, responsibilities and capabilities, levels of data literacy and governance, priorities and visions. Before approaching local authorities, these intricacies must be well understood if we're to make a success of our commercial offering.
- The need to involve third parties in decision making is not just a rhetorical commitment but something that became a standard practice for the vast majority of respondents. As many as 90% of public stakeholders and 86% of private, research and other actors do that using different means of engagement. The most popular ones are forums, round tables, workshops and private meetings.
- However, most public sector respondents (nearly 90%) believed that their stakeholders were satisfied with engagement processes, meaning PoliVisu's previous messages of using policy visuals for better stakeholder engagement is probably not the best driver for attracting them to the projects tools. However, questions around issues did raise communication and common understanding of issues as the biggest challenges in using big data for policy making.
- There are other tools that can help make policy decisions more collaborative. One unexpected finding of this survey is that it is 'soft' tools like case studies that most respondents are interested in, not necessarily maps, dashboards, portals, platforms or apps (i.e. advanced 'hard' tools), although some of these were also quite popular. Another unexpected finding is that public and

non-public respondents alike continue to rely on simple diagrams and static maps to inform and communicate their decision making.

- Collaborative policy making is not without issues. Poor communication, inability to reach a common understanding of issues, difficulty with managing different views, reconciling multiple priorities, convincing stakeholders to share data and encouraging competitors to collaborate all have been identified as major impediments to the success of multi-stakeholder cooperation.

4.3.3 Pilot Feedback

General Pilot Overview

Since pilots have been both contributing to and using content in the Policy Visuals Toolbox (including PoliVisu visualisation tools), we want to capture their experience with adopting the PoliVisu approach to using data for better decisions and how they see it contributing to their operations in the future. This feedback is important as it will inform the development of our value offering in the final year of the project. It is worth noting that pilot feedback is limited to cities that formed the initial network i.e Ghent, Pilsen, Issy-les-Moulineaux. Feedback from Mechelen, Kortrijk and any other cities that might test PoliVisu during the acceleration phase will be presented separately in the final exploitation plan.

Ghent has long wanted to understand student's mobility pattern in order to better assess its impact on living conditions e.g. house prices, rental market, traffic flows. The city was keen to use PoliVisu Toolbox as it tried to make sense of the mobile phone data obtained from Proximus, the largest telecommunications provider in Belgium. But it soon faced a challenge: how to identify student's residence from the available dataset? The rule²⁵ that was used to determine the most likely lodging place raises a lot of questions as to accuracy and representativeness. So although visualisation per se is not an issue, Ghent must address some data related issues before student heat maps can be useful for policy making. To that end, the city is planning to combine more data sources (Wi-Fi, administrative datasets etc.) and fine-tune the search algorithms in cooperation with Proximus.

In **Pilsen**, major roadworks are underway. They have a significant impact on traffic in and around the city, and more are planned for the years ahead. Before PoliVisu, the city lacked the necessary tools to make accurate predictions which could ultimately inform decision making e.g. what will happen to traffic flows when a new road is added or an existing one becomes partially closed? As a pilot, Pilsen has been using a purpose-built tool, the Traffic Intensity app,²⁶ to support planning and various operational decisions of the local administration. Speaking at the City Council meeting in June 2019, Pilsen's Deputy for Transport and Environment said: "The planned outputs are connected with obtaining data on real traffic in the city, their visualization and subsequent use for traffic control or navigation applications. It is also about creating a model for predicting the impact of closures and restrictions, so when planning certain construction modifications, it is possible to see a change in traffic volume before they start, thanks to the interconnection with the traffic data model. And this is crucial when deciding on future projects and their implementation."

Issy-les-Moulineaux has experienced high traffic volumes caused by people going to Paris for work by car. In order to address the problem, the city has been looking for new means to effectively communicate to citizens why it is important to change their travel patterns and commuting behaviour. When the pilot started, it had neither the tools nor data to create visualisations-cum-communication material. But as the project developed, Issy successfully acquired data from a private service provider (Mediamobile), created first visualisations with the help of Senx, a PoliVisu partner, and validated them in a series of user tests. The initial visualisations prompted policy makers to adopt additional objectives for the city: 1) evaluate

²⁵ To qualify as a 'dorm student' a user had to be i) absent from Ghent during the first week of measurements and ii) not in the city at weekends.

²⁶ <https://dopravaplzen.innoconnect.net/>

the impact of roadworks on congestion, 2) evaluate the impact of services and restrictions on congestion; 3) cooperate with a local start-up on the use of mobility application and evaluate anonymized data on behaviours.

Meeting Feedback

PoliVisu arranged for the Consortium to meet and discuss big data and policy making with a panel of experts from each pilot city. During year 2, the team meet with policy makers and planners from the City of Ghent and the City of Pilsen. Useful feedback includes:

- Policy makers don't necessarily want more data, they want relevant and usable data. This feeds into PoliVisu's premise of **policy ready data**
- Policy makers also must trust the quality of the data they receive from the administration, which raises questions of the level of **data literacy** needs of policy teams. Currently is hard for policy teams to understand the limitations of data (e.g. availability, usefulness and quality). Can PoliVisu visualisations make this better? However, policy teams believe it's not their job to assess data quality.
- They also require data in an **objective and fast way**. If there is a long process then it most likely won't be used. They don't fully understand the processing and cleaning process.
- In terms of visualisations they prefer simple, easy-to-understand visuals like **heatmaps**. However, also require information to also be downloaded into **tables** so they can easily input into traditional consultation documents, reviews and report.
- Big questions remain over how to use data for policy, as (a) data may not be accurate, and (b) currently misses qualitative data such as people's feelings. How accurate does visual data need to be? It is the same data informing policy in different ways. Visual data may just provide a starting point for discussions - **data as a conversation starter?**
- No great weight is put on social media data to provide qualitative information as this does not show a full range of views and is perceived to be **biased**.

The meetings provided useful insight into the minds of policy teams and their viewpoints on data use for policy. Many thoughts are conflicting resulting in new opportunities for further research and study by PoliVisu or new projects. In the short term the insights will help PoliVisu create better messages for policy workers around its products and develop more tailored and targeted communication and training material and activities.

Chapter 5. Updated Exploitation Proposition

PoliVisu's goal remains the enablement of all people to actively participate in urban policy making and hold decision makers accountable for their choices by making policy situations easy to view and explore in an interactive visual form. The vision for the project is a strong one and the exploitation team sees no reason to deviate from this goal. Based upon market research and feedback from policy makers, our exploitation strategy going forward is three-fold:

- (1) **Position PoliVisu better in the CivicTech and Smart Cities markets:** On the technical side, we will move to position and package PoliVisu tools in the Toolbox as civic / smart technologies which will help governments meet their transparency and inclusion goals, whilst combating the fear of digital by showing how we protect individual rights and privacy. We will emphasise in our

dissemination the PoliVisu technology/visualisations not in an isolated way but by embedding real-life collaboration and empowerment benefits through stories and evidence taken from the pilots. This will help expand beyond investments in the visualisations to include the non-technical capacity-building activities for co-creation to make policies more effective. The year ahead will explore how activities such as advocacy and storytelling within the pilots can advance this goal.

- (2) **Focus on two separate commercialisation strategies:** As the visualisations that PoliVisu can produce will vary city by city depending on actual city needs, we will focus on commercialising PoliVisu's two main commercial outputs as separate products, (1) WebGLayer and (2) the Traffic Modeller. Both will be supported by the Policy Visuals Toolbox, leveraging impact statistics and feedback from the pilots to convince new adopters. This synergistic focus will spread the commercialisation risk and make it easier for adopters to better choose the tool that best meets their needs. Key activities will include packing the tools to best attract new adopters, developing the most appropriate communication messages, and ensuring the Toolbox supports their goals.
- (3) **Nurture and develop strategic partnerships:** From the outset, PoliVisu has sought closer relationships with like-minded initiatives to advance its vision of more collaborative, data driven policy making across Europe. In the first year of the project, PoliVisu teamed up with Big Policy Canvas²⁷ to run a joint workshop on big data in policy making.²⁸ It has collaborated closely with Open Geospatial Consortium²⁹ to produce the initial White Paper on metadata standards.³⁰ It is now preparing a submission for the Common Dissemination Booster³¹ which will see PoliVisu joining forces with projects like Cutler, RUGGEDISED, DUET, Colnform, CoSIE, to work on potential shared exploitation opportunities. Also, in the pipeline are cooperation opportunities with various European and international CivicTech initiatives e.g. Open Government Partnership, TechSoup Europe, TransparenCEE.

We see our new strategy as an evolution from the previous exploitation plan. In response to our learnings and the changing global context, we've broadened the frame of our impact area from 'GIS Tech' to 'Civic Empowerment,' acknowledging that technologies must be coupled with collaboration strategies, as well as capacity building and process improvements, to help communities learn how to engage government, and to support government in learning to use technology effectively. The tactics to be deployed in the year ahead are outlined in the next two chapters.

Chapter 6: Business Models & Commercialisation

As outlined in the previous plan, instead of creating a new business entity, PoliVisu intends to create an environment for multiple strategic business partnerships that will give the SME owners of PoliVisu's innovative commercial products - Traffic Modeller and WebGLayer - the opportunity to grow their company and offering. By partnering with other PoliVisu organisations that provide different services/products within similar markets, PoliVisu provides each of its organisations with an opportunity to expand their product portfolio and reach new customers. The idea is to use these partnerships to strengthen weak aspects of businesses, share resources and even customers.

To further widen the opportunity for success PoliVisu has shifted its focus from a strictly GIS market to include a CivicTech and Smart City one. In these fields, priority will be given to particular segments:

²⁷ <https://www.bigpolycanvas.eu/>

²⁸ <https://www.poli visu.eu/single-post/2018/09/07/Joint-Workshop-On-Big-Data-Needs-Trends-Assets-A-Success>

²⁹ <https://www.opengeospatial.org/>

³⁰ <https://bit.ly/2AQjzUi>

³¹ <https://www.trust-it services.com/news/common-dissemination-booster-catalyst-policy-change>

GovTech and Smart Mobility. There are many subtle differences between CivicTech and GovTech, however the main thing to remember is that while CivicTech primarily focuses on community action, GovTech seeks to help governments improve policy processes, making them more efficient, collaborative and citizen centric.

GovTech Business Models

GovTech sector emerged fairly recently and as such many questions remain as to what public authorities want/are able to buy, and which providers are best positioned to address these needs. Other questions are more philosophical in nature. For instance, if the ultimate goal is to bring policies closer to people, should democracy be seen as just another market where companies compete with one another, driven by the desire to make a profit? Perhaps the most fundamental question concerns sustainability. If GovTech is to survive and ultimately thrive, can we build a viable economic model around digital tools whose purpose is to put citizens at the centre of policy making? If so, how?

In the wider CivicTech industry, two major economic models can be distinguished: an associative model and an entrepreneurial model. Typically, associations are volunteer based and operate with minimal costs covered mainly by donations. An example would be Regards Citoyens,³² a French association founded in 2009 which aims to enhance French democratic institutions by creating web applications that reuse public data and are republished in the form of free software. As donations constitute the main source of funding, the underlying economic model becomes quite precarious especially for those organisations that have employees as well as volunteers e.g. VOXE.³³ This often forces Civic and Gov Tech enthusiasts to create a business.

The entrepreneurial model has some advantages. For one, it becomes easier to attract investors/venture backing. Remix,³⁴ a GovTech business that specialises in planning public transit, designing streets and managing new mobility, raised \$27M in three rounds from 14 investors since its launch in 2014. For another, companies can use Business to Government (B2G) model to sell products, services and information/data directly to public agencies. However, the model also has its drawbacks. Businesses used to interacting with other businesses (B2B) or directly with consumers (B2C) often encounter higher-than-expected hurdles when working with government agencies. In part because the profit motive is absent and in part due to bureaucratic hurdles, governments may take more time than private companies to approve and begin work on a given project. Indeed, for many GovTech startups, the long and arduous process of contracting with government is one of the main factors stymieing the development of more and better products.³⁵

If PoliVisu, or any of its partners, choose to pursue a B2G model, there are ways to get around the procurement issue. This can involve going ‘below the radar’ by pricing products/services low enough to avoid the threshold that triggers the bidding process. Additionally, instead of using a fixed-price contract, PoliVisu may wish to operate a usage-based licensing whereby clients pay per use e.g. per visualisation. If a need for such visualisation comes from multiple departments (e.g. communications, transport planning, mayor’s office), the cost can be stretched across different budgets within an organisation, thus reducing the need for procurement.

For B2B and B2C models, a freemium arrangement could be the best option. When implemented correctly, the freemium business model can help drive massive traffic to a company's website, offer a trial experience that overcomes user resistance to buying something new, and can ultimately help convert free

³² <https://www.regardscitoyens.org>

³³ <https://www.voxe.org/>

³⁴ <https://www.remix.com/>

³⁵ <http://parisinnovationreview.com/articles-en/civic-technology-3-mission-impossible>

users to paying customers. Moreover, survey results showed a great appetite among respondents for freemium solutions. However, given the varied nature of PoliVisu tools, some of which are open source while others fully proprietary, it remains to be seen whether freemium principles can be reconciled with the commercial position of certain PoliVisu partners.

Smart City Business Models

As described in the Market section of this document Smart City covers a wide range of projects and initiatives that involve some form of digital solution and many cities are paying out over 50% of its total expenditure on infrastructure programs on private sector solutions³⁶. However, these revenues often refer to major initiatives.

To try and receive better clarity on how smaller projects and start-ups fair in this field, a recent study, *Business Model Framework for Smart City Mobility Projects*³⁷, split over 300 smart city projects from across the world into three categories to explore the underlying business models and revenue streams. They fell equally into city logistics, people mobility and info mobility.

City Logistic projects tend to be mainly about improving productivity and decreasing operational costs. Revenues from usage Fees (pay per use) are the most common - 81% of projects -, followed by Subscription Fees in 56% and Licensing in 12% of the sample projects. This underlines a propensity to offer services under subscription mechanisms rather than with more direct forms of monetization. 11% of the projects generate revenues directly from asset sales and 6% from Leasing, Lending and Renting. Just 2% of the projects generate revenues from advertising.

People Mobility projects were about proposing mobility in restricted situations, such as specific travel type zones or bans. The revenue models here were similar with pay-per-use monetization (93%) but a large portion of projects also offer subscription models (85%) as well. However, a difference from City Logistic projects, was that a consistent part of People Mobility projects (44%) have Advertising as a source of revenue.

Info Mobility is where PoliVisu more comfortably falls. The value created by Info-Mobility projects centres around improving travel speed and reducing delays (96% of the projects), improve travel safety (75%) and reducing travel costs (71%). These projects aim to improve the user's overall travel experience by aiding the user navigate the city, providing information about traffic, weather, and points of interest (88% of the projects), or informing the user on public transport routes and hours (23% of the projects). In terms of income, these projects displayed a propensity for subscription monetization (71%) as a revenue source. Like People Mobility projects, advertising is also important (23%). However, Info-Mobility projects also introduce new forms of monetization: software licensing (26% of the projects), and the sale of user data to third parties (26%).

PoliVisu Business Models

Taking on board the lessons and information gathered during the market research and customer dialogue parts of the project, PoliVisu has outlined separate business models for Traffic Modeller and WebGLayer using the Lean Canvas approach. This canvas is a variation of the traditional "Business Model Canvas" that focuses more on customer problems and how to deliver for particular customer segments. An explanation

³⁶ <https://www.smartcitiesworld.net/news/news/deloitte-identifies-new-business-models-to-fund-smart-cities-2973>

³⁷ <https://iopscience.iop.org/article/10.1088/1757-899X/471/9/092082>

of the “Business Model Canvas” approach can be found online Strategy and content for the approach came from Consortium discussions culminating in a Commercialisation meeting held in October 2019.

6.1 Lean Business Canvas for Traffic Modeller

Simple Problem Statement: Traffic Modeller provides insight for better mobility management by predicting future traffic based on simulation of different future road conditions (‘what if’ analysis).

Customer Segment: Public sector urban planner and mobility managers. Targeting the Smart City market.

Unique Value Proposition: Compared to other competitors in this space, Traffic Modeller (TraMod) is a unique web-based tool. All other modeller solutions (PTV, Visium, Cube, Omnitrans) are desk based. Its user interface is customized for city administrators, meaning there is no need of deep traffic engineering know-how to operate the model. This leads to time and cost savings. It also meets open government criteria by being an open source solution.

Solution: Traffic Modeller is owned by Plan4All which is an umbrella organization encompassing several members of the PoliVisu project mainly from the Czech Republic. Traffic Modeller is not an out-of-the-box solution, set-up. It can take many months to process the data to create the modeller which means significant set up and customisation costs for the purchaser (analyze, process, calibrate the OD matrix data and last but not least also tailoring the UI if requested). To do this the solution requires a strong project manager to liaise with the customer and the technical team. There are two potential starting points:

1. Cities that have no existing models - challenge in needing to find data to build the model, possibly from companies like PTV or by traffic engineers from P4A association
2. Cities with existing traffic models - there are at least 2,500 cities in Europe using some of the above-mentioned desktop traffic software which would make a transition to traffic modeller quicker. However, the challenge is these cities are usually happy with what they have so TraMod would need to displace the incumbent

Sales Channels: Traffic Modeller (TraMod) is currently being used by the City of Pilsen as part of the PoliVisu project. It is expected that they will become the first fully paying customer for Traffic Modeller. As the Plan4All development team are focused on the product and do not have a dedicated salesperson it was decided that a Business-to-Business (B2B) sales approach would be most effective, leveraging the customer base of other PoliVisu partners. The realistic plan is to start expanding business in the Czech Republic and Flanders through other PoliVisu partners where the teams already have a footprint and as numbers scale to look at structuring the organisation for further scalability outside these geographies. Currently three main sales routes have been identified for TraMod that PoliVisu will explore during its final funded year.

1. The team will use testimonials and case studies from Pilsen to target other cities in the Czech Republic through EDIP’s (PoliVisu partner and Plan4All member) existing customer list
2. GeoSparc (Belgium) can use it's network to sell TraMod to its customers (integrated with its own spotbooking software) in return for a % of the yearly licence
3. Macq (Belgium) is developing a modular smart mobility platform (M3) which can be used to offer TraMod to customers interested in traffic models. Using M3 data as a baseline helps speed up the development time. A % of the licence fee will be retained. This could be an important channel for reach into new geographies as Macq has customers in Belgium, Turkey, Ukraine and Lithuania amongst others

Revenue Streams: Cities currently pay an annual licence fee for their existing data/modellers. The PoliVisu survey shows this is a preferred business model for the public sector. Traffic Modeller proposes to adopt the same business model (software-as-a-service) but with better user interfaces at a lower cost. An alternative business model could be software-as-open source with consultancy fees for set-up and operation charged to the client.

Sustainable Competitive Advantage: The Traffic Modeller web-based solution has already been labelled as disruptive in this field.

Key Metrics: Key metrics will be applied to ensure P4All understand what drives financial results, including:

- Customer Acquisition Cost (CAC) - How much needs to be spent to acquire a customer
- Customer Lifetime Revenue (CLR) - Helps determine how much to spend on CAC and keep customers
- Revenue Run Rate (RRR) - determines how the business is scaling

Cost Structure: Cities currently pay an annual licence fee for their existing data/modellers. The team knows that Cube license cost in excess of 20,000 EUR/year, PTV Visum is more expensive. Traffic Modeller proposes to offer a competitive price for early adopters.

- Setup costs (one time) - preliminary estimate 20,000 EUR
- Yearly license - preliminary estimate 20,000 EUR

6.2 Lean Business Canvas for WebGLayer

Simple Problem Statement: Users need to make effective policy decisions that are evidenced-based, considering the needs of the public and other stakeholders. WebGLayer enables easy-to-use, drill-down and analysis of big historical data sets through interactive maps and charts (identification of hotspots, risky areas etc.)

Customer Segment: Policy making teams and urban planners. Targeting CivicTech and Smart City market.

Unique Value Proposition: WebGLayer is a client device-based solution which can handle interactive analysis of datasets consisting of hundreds of thousands of records. The user-friendly interface allows any policy maker to explore the data themselves without the need for a data scientist and can be tailored to explore specific policy problems.

Solution: WebGLayer is an open source software. It is maintained and further extended by start-up InnoConnect. WebGLayer is an ideal solution for interactive analysis of datasets up to a few hundred thousands of records. One of the biggest hits for uses of WebGLayer has been a traffic accident map which is now being used by both Pilsen and Flanders police. InnoConnect are expanding the traffic accident map to create a road safety dashboard product.

Sales Channels: As with TraMod WebGLayer can be sold/marketed via Consortium channels:

1. The team will use testimonials and case studies from Pilsen to target other cities in the Czech Republic
2. GeoSparc (Belgium) can use it's network to sell WebGLayer to its customers in return for a fee share
3. Macq develops a modular smart mobility platform (M3) which can be used to offer WebGLayer to customers as one of its modules in return for a fee share

In addition, InnoConnect can use its Police connections and those of Macq to offer the accident map/road safety dashboard to other forces.

Revenue Streams: Cities pay an affordable monthly/yearly fee for access to WebGLayer features depending on needs. Gives opportunities for cities to start using data for policy making whilst keeping figures below procurement thresholds.

Sustainable Competitive Advantage: WebGLayer provides an affordable way of analysing large historical data sets without having to purchase an expensive platform containing features the customer doesn't need. It's an affordable way of working with policy visualisations that can be used by experts and novices.

Key Metrics: As with TraMod:

- Customer Acquisition Cost (CAC) - How much needs to be spent to acquire a customer
- Customer Lifetime Revenue (CLR) - Helps determine how much to spend on CAC and keep customers
- Revenue Run Rate (RRR) - determines how the business is scaling

Cost Structure: An initial multi-option pricing model for services has been outlined as follows. Please note this is subject to change and refinement. Prices exclude VAT and any additional development support or customer development will be charged at 70 Euros per hour.

Model	Free (for DIY developers)	Starter (built on top of WebGLayer)	Optimal (built on top of WebGLayer)	Business (built with GLayer*)
	Free	10 € / month	275 € / month	1000 € / month
Technology for data calculations and map rendering	Client device GPU processing	Client device GPU processing	Client device GPU processing	Server-side GPU processing
Data source	-	Static file	Live update (automated)	Live update (automated)
Data size (records = row counts)	-	100 000 records	Up to 500 000 records	200 million records
Extra features	Heatmap layer Column chart filters	Heatmap layer Visualise point details from the map 5 column chart filters	Starter features plus: multiple map colour schemes 10 column chart filters checkbox filters share via permalink print to PDF export to csv additional map layers Area selection	✓ All included Unlimited filters
Hosting	-	✓	✓	AWS
Maintenance & updates per month	-	-	2 hours	4 hours
Additional map layers / GIS services	-	-	3	✓ (not limited)

Start up Development Support	For DIY visit webglayer.org	2 hours	3 days	5 days
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* GLayer (currently in development) will be able to handle on the GPU of the server much higher volumes of data at once (tens of gigabytes) for instantaneous filtering and map rendering. Glayer will be more scalable than WebGLayer (designed as client device GPU data processing) and thus shall be used for certain big data use cases, e.g. for the big traffic ANPR or FCD data.

Chapter 7: Exploitation Pathway

7.1 Exploitation Strategy

Moving forward during the final year of the project, PoliVisu will work towards a final Business and Exploitation Plan that will see the benefits of PoliVisu be sustained after the end of initial funding. This includes both the non-commercial outputs and the commercial ones. Both categories of results support each other.

Non-Commercial Strategy

PoliVisu will apply two complementary strategies to drive the non-commercial exploitation forward: mainstreaming and multiplication. In short, mainstreaming is the process of transferring project results to relevant decision makers, while multiplication is all about finding new users or convincing existing ones to use the results more often. To make non-commercial exploitation possible, certain preconditions have to be met, and they often overlap with commercialisation requirements.

One important and obvious requirement is that PoliVisu results must represent value for the target groups. This has been achieved by constant gathering of feedback from stakeholders who match the definition of potential adopters. Evaluation data is then processed by relevant teams at PoliVisu to make improvements to the Policy Visuals Toolbox (home to all the non-commercial outputs) in line with user preferences. Going forward, project partners will ensure the continued utilisation and potential refinement of project results within their organisations' daily work, therefore directly contributing to the planned multiplication efforts.

Another requirement is for results to be publicly accessible. PoliVisu would like to reiterate its commitment to the principles of Open Access for all applicable results and deliverables and will ensure that every such output is included in a special section of the Toolbox. Use of third-party repositories such as OpenAIRE and ResearchGate will help mainstream our knowledge within research community, which is one of the identified target user groups. Additionally, our 'soft' exploitable outputs (e.g. policy model, knowledge base, training materials) will be maintained, re-used, configured and refined in such a way as to promote maximum multiplication post-project.

The third requirement concerns change. The concept of collaborative, data driven policy making (DDPM) is not new. However, as our past surveys showed, there are great variations across Europe in terms of data literacy, and even organisations that have a track record of DDMP lament they don't use the benefits of big data in full. PoliVisu realises that promoting emerging concepts always implies change. This, in turn, requires convincing those who are going to be affected by new concepts and methods of their value, effectiveness, relevance. PoliVisu's public-sector partners are committed to providing to their policy makers/members guidelines on big-data use for mobility policy-making and will use the PoliVisu Toolbox

to publish the results. Moreover, partners' lasting interest in big data, policy making and social responsibility will ensure their active involvement in this research field and guarantees project results' utilisation in similar contexts/domains for further research purposes.

Finally, the project will need to make a key decision around ownership of the Toolbox at the end of the project. Research has shown a need for the case studies and support material so these need to be continued to be curated and maintained. To this end PoliVisu will explore ownership options within the Consortium (e.g. Plan4All) and outside the Consortium (e.g. EC open data portal, OASC etc.) and finalise the best course for long-term sustainability.

Non-Commercial Strategy

To ensure the Commercial products are pretty much market-ready by the end of the project, two working groups have been established to achieve the necessary business plans and agreements needed between partners to achieve the B2B aims of the visualisation products. These groups will have bi-monthly teleconferences and will meet ad-hoc in smaller groups and before project consortium meetings.

Traffic Modeller Working Group

Lead: Plan4All

Commercial Members: EDIP, HSRS, GeoSparc, Macq, ATC, InnoConnect

Supporting Members: 21c, AIV

Key Activities:

- Explore B2B opportunities e.g. Integrating TraMod with GeoS SpotBooking/Gipod roadworks database
- Look at new product ideas such as specialised dashboards
- Complete advanced business plan canvas
- Finalise revenue models and create three-year business plan
- Explore potential start-up help / innovation accelerators
- Develop working agreements / contract between the relevant partners
- Package and improve marketing material for TM

WebGLayer Working Group

Lead: InnoConnect

Commercial Members: GeoSparc, Macq

Supporting Members: 21c, ISP

Key Activities:

- Explore B2B opportunities e.g. Integrating Maq's M3 data with WebGLayer
- Build upon the road safety product
- Complete advanced business plan canvas
- Explore potential start-up help / innovation accelerators
- Finalise revenue models and create three-year business plan
- Develop working agreements / contract between the relevant partners
- Package and improve marketing material and messages for WebGLayer

Both groups will endeavour to expand the products business models more fully to not only include business parameters but also the impact on society the project can deliver. These findings will help develop key messages for each product, help position it better in the marketplace and refine the underlying revenue-based business model.

An expanded business model canvas which covers in detail many of the key decisions and details that each working group needs to consider was developed by one of PoliVisu's steering board members from imec, Dr. Nils Walravens (see diagram below). Two versions of this canvass, one for each product, will be provided in the final version of this deliverable due at the end of October 2020.

	Value Network	Technical Architecture	Financial Architecture	Value Proposition
Business design parameters	Control Parameters		Value Parameters	
	Control over assets	Modularity	Investment structure	User involvement
	Ownership vs Consortium Exclusive vs other Influence	Modular vs integrated	Concentrated vs distributed	Enabled, encouraged, dissuaded or blocked
	Vertical integration	Distribution of intelligence	Revenue Model	Intended value
	Integrated vs disintegrated	Centralised vs distributed	Direct vs indirect	Price/quality Lock-in effects
	Control over customers	Interoperability	Revenue sharing	Positioning
	Direct vs mediated Profile & identity management	Enabled, encouraged, dissuaded or blocked	Yes or No	Complements vs substitutes Branding
Public design parameters	Public Governance Parameters		Public Value Parameters	
	Good governance	Technology governance	ROPI	Public value creation
	Harmonising existing policy goals & regulation Accountability & trust	Inclusive vs exclusive Open vs closed data	Expectations on financial returns Multiplier effects	Public value justification Market failure motivation
	Stakeholder selection	Public data ownership	Public partnership model	Public value evaluation
Organisational	Choices in (public) stakeholder involvement	Definition of conditions under which and with whom data is shared	PPP, PFI, PC...	Yes or No Public value testing

Figure 6: Two-dimensional business canvas (N. Walravens)

7.2 Exploitation Tactics

To support both the commercial and non-commercial strategies, the PoliVisu team will adopt a number of tactics in the coming year. The key ones being:

A) Presence at major industry events

During the second year of PoliVisu, the Consortium disseminated the projects results at 22 European events. This work will continue during the final year, beginning with two major networking events. The first is EU DataViz 2019³⁸, an international conference organised by the Publications Office of the European Union, addressing the needs of the community engaged in data visualisation for the public sector in Europe. The second is the Barcelona Smart Cities Expo³⁹ as part of the Open and Agile Smart Cities (OASC) stand.

B) Build Public Sector capacity for policy visuals through Webinars

PoliVisu explored the creation of a Massive Open Online Course (MooC) for capacity building of policy teams and civil servants. However, after multiple meetings with MooC providers it was decided the unforeseen expense in creating an effective course (30,000 Euros plus) was too high. Instead the project

³⁸ <https://op.europa.eu/en/web/eudataviz/home>

³⁹ <http://www.smartcityexpo.com/>

will look to support the MooC that will be created by sister project DUET (Digital Urban European Twins) who has a dedicated budget for this work.

In the meantime, PoliVisu will continue to build its central Policy Visuals Toolbox as the go-to resource for anyone wanting to learn more about using data visuals to support policy making. The resources here will be supplemented with a series of 45-minute Webinars on different aspects of using data for Policy making, including use of the two main tools. These will be run live, recorded and added to the Toolbox.

C) Develop mutually beneficial partnerships

PoliVisu believes in the power of collaboration and is practicing what it preaches to policy makers through strategic cooperation with outside partners. The key ones being:

OASC: The PoliVisu consortium is closely collaborating with Open and Agile Smart Cities (OASC) initiative. This partnership is important for knowledge and lessons learned sharing, as well as splitting dissemination costs for large events to deliver increased value for money for the EU. The best example is the Smart City Expo World Congress from Barcelona from November 2019 where PoliVisu will be hosted at the OASC booth. Using this formula, PoliVisu will be promoted by the OASC initiative and by the PoliVisu consortium, therefore increasing its visibility and reaching a greater number of stakeholders. The teams are also in discussion around OASC potentially setting up a new Knowledge Academy for its members, which PoliVisu could contribute to.

Common Dissemination & Exploitation Booster: PoliVisu has led the application to be part of the EC's Dissemination & Exploitation Booster. Together with a group of 6 similar H2020 projects, PoliVisu aims to receive support from the EC to build the project group's capacity in disseminating the research results and increasing the exploitation potential. The projects that are part of the group are: PoliVisu, EUXDAT, EO4AGRI, Cutler, PoliRural, DUET, NOESIS

D) Look out for extra start-up support

Both the innovative commercial outputs from PoliVisu are by start-ups that can benefit from extra help and support provided by innovation boosters and accelerators such as the European Innovation Council (EIC) accelerator.⁴⁰ For-profit SME's can apply for between 0.5 to 2.5 million Euros to further develop products ready for the market.

In addition, the EIC offers free business coaching and mentoring to help businesses scale and grow which PoliVisu partners can access by applying to the Enterprise Europe Network (EEN).⁴¹ Coaching offered here covers business development and financing. By registering as part of the EIC Community both the Traffic Modeller and WebGLayer groups will benefit from partnering and networking events with investors and larger firms.

7.3 Communication Strategy

PoliVisu is at a stage where visuals are being used by the pilots to achieve policy impact. Case studies have been provided in the policy visuals Toolkit and benefits are starting to be realised. This means the time is right to help focus city conversations into successful policy visuals adoption talks. Consortium partners interactions with cities (potential clients for our commercial partners) need to be meaningful. i.e. not just be about a visual tech product, but about their real-time pain points and wider strategic focus. **Storytelling is an effective medium to achieve this aim.**

⁴⁰ <https://ec.europa.eu/easme/en/section/sme-instrument/eic-accelerator-sme-instrument-funding-opportunities>

⁴¹ https://een.ec.europa.eu/?pk_campaign=EIC_SMEi&pk_kwd=Indng

The best stories give people a reason to care. The story can be long, or short, serious or funny but it must be a human story. The PoliVisu approach is not to tell stories about the stats and technical features of products, no matter how great we think they are. Our goal should be to tell stories that show people a better life.

Stories work because evolution has wired our brains to respond to storytelling. When presenting a simple fact or statistic, 2 parts of an audience’s brain respond to enable agreement or disagreement. A story, however, doesn’t spark agreement or disagreement, but rather participation. 7 parts of the brain are ignited by stories. Stories help us believe, they ignite emotions and feelings, helping us to empathise and learn. This hardwiring makes stories 22 times more memorable than facts alone.

Telling a good story is like a recipe. There are certain ‘ingredients’ that need to be part of the mix for it to be a success. The elements of a well told narrative follow the plot lines of some of the world’s most well-known stories from the Lord of the Rings to Star Wars and Harry Potter. Key elements include:

1. **Beginning:** A well-crafted beginning shines a light on the challenge or problem your audience faces
 - o Identity – who was the protagonist/hero when they started the journey?
 - o Change – what did the hero want to change about their world?
2. **Middle:** Describes the struggle to meet the challenge
 - o Struggle/Pain point – what was the breaking point that made the hero implement change?
 - o Insight – what tool or insight did the hero use that made overcoming the challenge easier?
3. **Ending:** Outlines a resolution that ignites in the listener your call to action
 - o Resolution – where is the hero today and how is life better?

Therefore to support exploitation and make PoliVisu more memorable, the project proposes to create a series of short stories based upon the realities of each of the pilots which can be used to run communication campaigns which help demonstrate the benefits of using data visuals to support policy making.

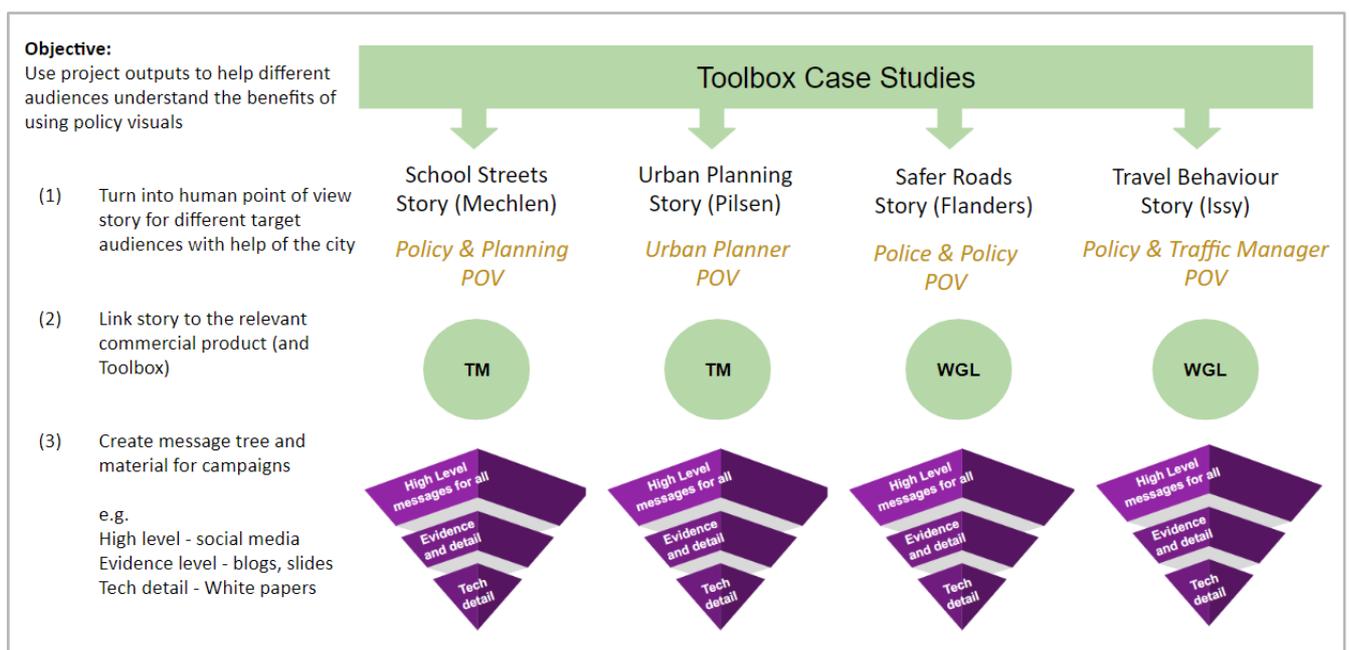


Figure 7: Four PoliVisu Stories

The pilots of course form the basis of each story with the Toolbox case study as a starting point. The Dissemination Lead will take these and work with the city to translate the information into a more human based narrative following the outline above. Then based on the story, a three-tier message tree will be created with high level, evidence level and tech details messages that can be used in all consortium exploitation material from social media to academic publications and white papers (see diagram above). This approach means the stories can support both the reuse of commercial and non-commercial outputs.

The project has already started to experiment with data stories using a Page Flow product which will also be adopted to help create the PoliVisu human stories.

7.4 Working Plan Timeline of Next Steps

The table below presents next steps that PoliVisu partners will undertake in the final year of the project to implement its sustainability and exploitation strategy. This is a living plan and will be updated with new activities and events throughout the working year.

Key

	= Planned Events
	= Business Planning activities
	= Non Commercial activities

What	When	Who
Apply for Common Dissemination Booster.	Nov 2019	21c
Participate in EU DataViz 2019 - feedback to Consortium	Nov 2019	21c
Represent PoliVisu at Smart City Expo World Congress in Barcelona.	Nov 2019	21c/AIV
Present PoliVisu and the results of Pilsen pilot at Inovujeme Plzeň , city conference	Nov 2019	INCO, P4A
Present PoliVisu and the results of Pilsen pilot at GIS Day conference in Prague	Nov 2019	INCO, P4A
Present PoliVisu and the results of Flemish pilots (Ghent, Mechelen, Kortrijk) at an annual conference Trefdag Informatie Vlaanderen .	Nov 2019	AIV
Invite contributions to PoliVisu open access book		
Begin review of sustainability options for the Policy Visuals Toolbox	Dec 2019	21c/AIV
Start storytelling process	Dec 2019	21c
Commercialisation working group update calls	Dec 2019	21c

Create 2nd edition of the Toolbox deliverable including development plan	Dec 2019	21c
Prepare schedule for Training Webinars to upskill potential adopters of the Toolbox.	Dec 2019	21c
Commercialisation working group update calls	Feb 2020	21c
First human stories created	Feb 2020	21c
Provide updated website content/marketing messages to TraMod and WebGLayer	Feb 2020	21C
Involve PoliVisu data in Ghent Hackathon	Mar 2020	Ghent/AIV
Begin Webinar delivery	Mar 2020	21c, P4A
Finalise content for PoliVisu open access book	Apr 2020	PoliMi
Commercialisation working group update calls	Apr 2020	21c
Commercialisation working group update calls	Jun 2020	21c
Apply for EIC Accelerator	Jun 2020	P4A/IC
Commercialisation working group update calls	Aug 2020	21c
Start shared working on Business and Exploitation Plan	Aug 2020	21c
Publish the final Standards White Paper on metadata standards & interoperability.	Aug 2020	AIV, HSRS
Finalise Business and Exploitation Plan	Oct 2020	21c
Partner commercial agreements signed or close to signing	Oct 2020	All
Run visuals training workshop at Global Forum conference	Oct 2020	ISP
Distribute book and final results at Barcelona Smart City Expo and World Congress	Nov 2020	All
Run networking event for Commercial partners at Barcelona Expo	Nov 2020	All

Appendix A: Conference Training Overviews

(1) ICT 2018

How does truly participatory, data-driven policy making work in practice? What kind of data should policies be based on? Will simple charts be enough or do policy makers need better, more advanced tools to make informed decisions? PoliVisu decided to provide a glimpse of the 21st century policy making by running a networking session at the ICT2018 conference in Vienna.⁴² The event took place on 6 December 2018 and was organised as a role game that required participants to

- **Visualise:** Play with a map based on the actual traffic accident data collected by the Flemish police
- **Discuss:** Break out into groups and investigate the situation from four different perspectives
- **Decide:** Answer map related questions and share the results with others

The audience was divided into four groups - cycling charity, pedestrian group, motorists association, public authority - each of which had to work with the same visualisation.⁴³

Cycling charity

The profile developed for this group emphasized the charity's concern with the number of cyclist accidents in Flanders, some of which were fatal. The organisation's ultimate objective is to enable people of all ages, backgrounds and abilities to cycle safely, easily and enjoyably in the region.

The first thing that caught this group's attention was the great number of accidents overall, even in non-urban, far-away places. Participants also noticed that there are hardly any accidents when it's raining, that most accidents happen in the early morning and late afternoon, and that cycling activity in general has been on the rise recently.

The group thought that more public transport and more cycling lanes could help reduce the number of road accidents involving cyclists, thus making the activity more attractive for the masses. However, additional research is needed to better understand what motivates people to start/cease cycling. Is road accident risk a significant deterrent for all or only some citizen groups?

Pedestrian group

The profile of this group was built around the recognition that walking carries a certain amount of risk. So one of the group's aims is to ensure that more walking does not lead to more pedestrian casualties in Flanders, especially among school children.

The pedestrian group found the visualisation to be pretty good at giving a quick overview of where most accidents happen. Interestingly, participants discovered that people get hit more often in inhabited areas than on the outskirts or near motorways. Their suggested measure therefore focused exclusively on inner city areas (e.g. speed limits, safe islands, speed bumps, clear signposting). The group also suggested developing a dashboard that would be able to produce additional statistics/correlations, such as traffic intensity v traffic accidents.

Motorists association

The persona developed for this group was slightly provocative, as it stressed the association's belief that accidents happen for many reasons, and that victims often bear the responsibility for what happened.

⁴² <https://ec.europa.eu/digital-single-market/en/events/ict-2018-imagine-digital-connect-europe>

⁴³ <https://accidentsflanders.innoconnect.net/>

Cyclists and pedestrians need to better follow the rules and guidelines before blaming the drivers, the profile card concluded.

After looking at the map, the participants noticed three things: the concentration of accidents in big cities; that most collisions happen with cyclists; and that only a few accidents end up fatally. Like the previous group, they also suggested inner city measures similar to the ones above. One recommendation that was different though was educational campaign for cyclists/pedestrians, as “motorists” thought some awareness building could help impart the necessary knowledge on the rights and responsibilities of stakeholders other than drivers.

Public Authority

The fourth group’s profile stressed the concern of Flemish policy makers with the number of car accidents involving pedestrians and cyclists. A policy intervention is clearly needed but where should the region’s priorities lie?

The group immediately noticed that there are several major hotspots clustered around big metropolitan areas. Perhaps not surprisingly, alcohol was a major cause of road accidents, which also tend to happen in certain areas/intersections. What is surprising though is that there are no or few diseased victims in the city centres, which the participants thought can be attributed to lower speed limits. A policy measure that this group decided to introduce in the end was aimed at measuring traffic near schools to minimise the risk for the most vulnerable group that is children.

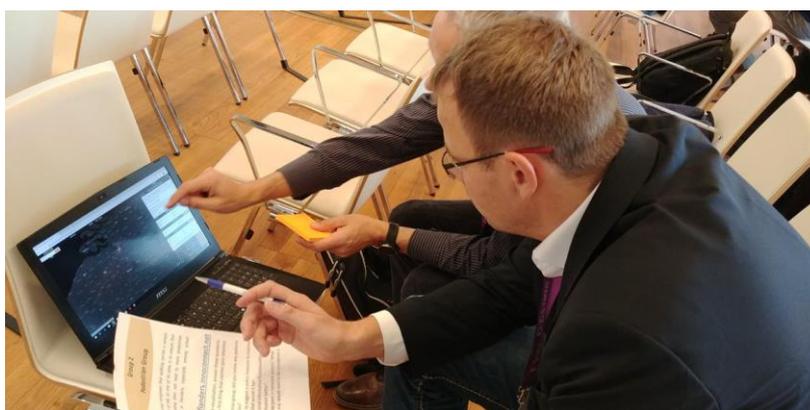


Figure 8. Workshop participants at ICT2018 play with the Flanders accidents maps

Insights collected from participants during the role game pertained both to their persona and the map itself. In the months following the workshop, technical team at PoliVisu has introduced improvements to the tool based on the gathered feedback, which included requests to add the “+/-” buttons to easily zoom in/out across the whole map; select accidents on the map as well as from a list; view accident photos in the pop-up screen; share the map in WMS for further integration; perform a more in-depth analysis using additional data on traffic volume, bicycle routes, road surface, traffic lights.

(2) Major Cities of Europe

Twenty-five local authorities, SMEs, researchers and national government delegates took part in an intimate policy visualisation workshop for cities held at the annual Major Cities of Europe (MCE) conference in Venice on the 13th June 2019.⁴⁴

⁴⁴ <https://www.majorcities.eu/conferences/2019-venice/>

Introduced to the digital transformation initiative, PoliVisu, by Lieven Raes of Informatie Flanders, participants had the opportunity to learn about the benefits of using big and open data to make better policy, before getting hands-on with real policy visualisations from the cities of Ghent, Issy-les-Moulineaux and Pilsen.

After feeding back on their experience with the visuals, delegates came together to discuss their difficulties in using big data and share the experiences they face in the course of their work. Augmented by the interactive tool Mentimeter, the PoliVisu hosts learned that the main reason why big data was not being currently used for policy making was a 'lack of clear purpose', followed by a 'lack of internal skills'. Delegates also cited the need for more inspirational use cases, training and less-confusing regulations around data use to better help them unlock the potential benefits for policy making.

Informatie Flanders Coordinator Lieven Raes said he was delighted with the feedback from the participants: "The knowledge we gained will help shape the collaborative decision-making tools we are building in PoliVisu. Policy making is an incredibly complex and emotive subject; and if we can help different stakeholders better work together through a shared understanding of a problem then we offer real value." Raes continued, "after today we believe we are on track to help cities understand good practice and create training and use cases that could be of real use not just in our pilot cities but also across Europe'.

In addition to the workshop, PoliVisu was also presented to all delegates on the main conference stage by Susie Ruston McAleer of 21c. All feedback from the MCE event has been analysed by the PoliVisu team to improve the Toolbox. The aim is to ensure public administrations and interested groups have everything they need at their fingertips to benefit from evidence-based policy making for themselves.



Figure 9. PoliVisu pilots discuss their results with MCE participants in Venice

Appendix B: Policy Maker Survey

Using Data Visualisations for Better Policy Making

Introduction

Thank you for clicking on our short survey.

By completing this brief questionnaire, you will help us better understand how public and private sector organisations use collaborative, data-driven policy making to achieve their objectives. We will anonymise all answers so no individuals can be identified from the submitted responses.

It will only take a couple of minutes to complete this survey.

Many thanks from,
Team PoliVisu



ABOUT POLIVISU: The aim of the PoliVisu project is to enhance public involvement in urban policy making by equipping decision makers with the skills and tools to use big data for collaborative policy experimentation. PoliVisu receives funding from the EU Horizon 2020 research and innovation programme under Grant Agreement No 769608. Visit polivisu.eu for more information.

Start

Q1. Are you involved, either directly or indirectly, in policy decisions concerning transport and mobility?

*

- Yes
- No

Q2. If yes, how are you involved?

- Strategic planning
- Transport and infrastructure projects
- Real time traffic management
- Design and innovation of new solutions
- Other:

Collaborative decision making

Q3. Do you involve third parties in decision making processes? *

- Yes
- No

Q4. If no, what is the reason for not involving third parties in your decision making process? *

Q5. How do you involve third parties in your current decision making process? *

- Community panel composed of citizens, NGOs, businesses etc.
- Consultation that seeks public's input on large-scale projects, laws, policies
- Small-scale surveys using questionnaires and interviews
- Moderated focus groups
- Private meetings
- Stakeholder forums, round tables, workshops
- Other:

Q6. Overall, how satisfied do you think your stakeholders are with your current process? *

- Very satisfied
- Satisfied
- Not satisfied

- Very unsatisfied
- Don't know
- It varies per group

Q7. What's your biggest challenge in collaborative decision making ? *

- Communication
- Common understanding of issues
- Managing different views
- Encouraging competitors to collaborate
- Reconciling multiple priorities
- Convincing stakeholders to share data
- Other:

Q8. What kind of tools could help you make better, more collaborative policy decisions? *

- Online community platforms
- Case studies from other data driven projects and initiatives
- Crowdsourcing apps for gathering data
- Social media for gathering opinions
- Open Data portal for access to data
- Data dashboard for monitoring city intelligence
- Dynamic maps to explore specific issues
- Other

Data driven decision making

Q9. Do you use data-driven evidence to help make and communicate decisions? *

- Yes
- No

Q10. If no, what is the reason for not using data-driven evidence to help make and communicate decisions?

Q11. What data-driven evidence do you use for decision making? *

- Statistical reports
- Mathematical models capturing the structure and behaviour within a system e.g. transport, traffic
- Social research based on a representative sample and rigorous methodology
- Scientific results obtained through laboratory tests and experiments
- Your organisation's performance metrics e.g. KPIs
- Other:

Q12. What visualisations, if any, do you use to inform and communicate your decision making? *

- Static maps
- Dynamic maps
- Simple diagrams (bar, pie, line)
- Advanced diagrams (flow map, network diagram, statistical presentations)
- Text-based (word cloud)
- Other:

Q13. What tools do you use for policy visualisations? *

- Open Source tools

- Commercial solutions
- In-house tools
- Other:

Q14. Where would responsibility for managing transport and mobility visualisations lie in your organisation ? *

- Policy team
- GIS team
- Urban planning
- Transport department
- Not sure / Undecided
- Other:

Q15. Do you have a specific budget for managing policy visualisations? *

- Yes, included in our IT budget
- Yes, included in our communications/consultation budget
- Not yet, but we are planning to have one in the future
- No
- Other:

Q16. What kind of business model would encourage you to use a policy-visualisation tool? *

- Annual licence fee
- Pay per visualisation
- Monthly subscription
- Freemium
- Other:

And finally...

Q17. What organisation are you from? *

Q18. Where is your organisation based? *

Q19. What is your role in the organisation? *

Q20. Could a member of PoliVisu contact you for a short informal interview to help better inform our research and innovation project? If so, please leave your name and email below. *

Appendix C: Policy and Data Landscape Review

No	Name	Policy Use	Data Use	Lesson Learned for PoliVisu
1	CIVITAS Urban Mobility Tool Inventory	Online database of over 100 tools and methods that helps local authorities make better informed decisions about which planning tools to apply in their given local context	CIVITAS resource base doesn't include any datasets, only qualitative information e.g. policy briefs, case studies, tool catalogue	PoliVisu Toolbox can attract visitors and generate high demand without hosting any datasets. To remain popular, though, it must have content that is interesting, relevant and of high-quality. It should also be diverse
2	Urban Transport	Online transport policy tool	National data (e.g. car ownership, vehicle fleet composition, car ownership taxes, energy mix for electricity generation, etc.).	The tool allows users to see the expected impact of different policies - which users can select and deselect - until 2030. While PoliVisu does not plan to build anything of this kind, the project may wish to add a Q&A style tool to the platform, which can suggest e.g. the best visualisation type or an optimal policy process based on user's needs
3	uBreathe	Free app with a heatwave map	DEFRA data	The app works only on mobile devices. PoliVisu must ensure that its Toolbox is optimised for mobile browsing. Tools like WebGLayer can also be upgraded as during hands-on workshops users couldn't access it from their mobile device
4	RapidAir	Enables city-scale air quality levels to be calculated and updated within a matter of minutes so policy options are developed, tested and refined with more speed than ever before.	n/a	PoliVisu Toolbox can be applied to sectors other than transport and mobility. Environment is another area where tools like WebGLayer can be successfully applied to e.g. measure pollution
5	Eltis	Platform which facilitates the exchange of information, knowledge and experiences in the field of sustainable urban mobility in Europe.	Statistical data on sustainable urban mobility topics	Eltis is similar to CIVITAS in that it is a source of mostly qualitative information e.g. training material, videos, case studies. It is a popular resource because it hosts content which is up-to-date, interesting and of high quality. PoliVisu would be well advised to do the same
6	Smartphone-generated behavioural data in cycling traffic	National transport project Germany	Smartphone generated data	Interesting way of capturing mobile traffic. Such data can be integrated into existing models to provide a better representation of the system's traffic flows

7	StreetMix	An open-source, interactive tool which can be used to design streets and street networks. It visualises the street design process and can be used by urban planners to design sustainable urban environments.	n/a	Both policy makers and citizens are increasingly looking for easy-to-use tools where they can just drag and drop items on the screen to better understand a problem, explore an issue from multiple perspectives, plan a mitigation action et cetera
8	PTP-Cycle project	EC project ended March 2016. Is using Personalised Travel Planning	Local data (e.g. staff, residents, student names or addresses)	Although the projects are quite different, PoliVisu would be well advised to follow PTP-Cycle's recommendation to set up evaluation framework and baseline before starting any major user testing/piloting. This would help calculate more accurately the different layers of benefits that may accrue as a result of planned activities
9	PUSH & PULL	EC project created a Catalogue of Case Studies on Parking Management Solutions	n/a	Both cities have a pilot in Ghent although PUSH & PULL's focus on parking is not immediately applicable to the PoliVisu pilot. This could potentially be more relevant to Kortrijk, which is also testing a parking scenario
10	ADVANCE tool	EC project - As a result of the work with the ADVANCE Audit tool, the city administration has worked on a new Traffic and Mobility Plan (TROMP, the Swedish version of a SUMP)	Mobility data like modal split data, length of the street network etc.	ADVANCE pilots implemented local mobility plans using the project's audit tool. PoliVisu pilots can try to sketch the contours of a similar forward-looking plan in Y3, explaining where and how PoliVisu fits in the city's future mobility landscape
11	Aimsun Next traffic modelling software	Software that allows you to model anything from a single intersection to an entire region	Traffic data	PoliVisu partners Inno Connect and Plan4All may want to upgrade their tools to enable traffic prediction based not only on historic data but also real-time one
12	The Bike Citizens Analytics tool	Tool allows in-depth insight into GPS cycling data, analysis, scenario building and evaluation of cycling infrastructure projects. The tool visualises data in the form of "heat maps"	Cycling data (e.g. exact route taken, speed, delays)	Cycling data is increasingly used to support urban planning. When combined with other transit data (public transport, cars etc.), it can significantly improve the traffic model and therefore help decision makers implement more evidence based policies / measures
13	BIG Policy Canvas	H2020 project - offers its perspective on how barriers that impede big data-driven modernisation in policymaking can be overcome.	n/a	PoliVisu could present the contents of its Toolbox in the same way that BPC did i.e. as a database which allows users to find things quickly and easily

14	Cutler	H2020 project - policies on the water element from a city	Uses big data to better manage city administration and connect with citizens	Although Cutler is different from PoliVisu in many ways (e.g. it plans to build a SaaS platform, publish datasets), the two share the same ambition - to improve policy making through the use of big data
15	Big Data Europe	H2020 project enabling European companies to build innovative multilingual products and services based on semantically interoperable, large-scale, multi-lingual data assets and knowledge, available under a variety of licenses and business models.	Multi-lingual data assets and knowledge	Big Data Europe has a pilot on transport, which aggregates different datasets to tackle congestion in Thessaloniki. PoliVisu tech team may wish to explore the solution behind Thessaloniki pilot which is available on GitHub
16	RUGGEDISED	H2020 project - will create urban spaces powered by secure, affordable and clean energy, smart electro-mobility, smart tools and services.	Sensors data, data on the city's energy consumption and production, buildings and technologies, travel patterns, as well as non-technical information such as business models and support processes	RUGGEDISED has a pilot in Rotterdam focused on parking, which could be useful for the Kortrijk pilot. However, the focus is mostly on electric vehicles and ways in which they can be charged
17	DataViz	Research study - DataViz: improving data visualisation for the public sector	Area related data	Although dated (2009), the research identifies important intervention points which can be leveraged to improve exploration, analysis, presentation and communication of (local) issues by public authorities. The typologies presented in the report provide a useful reference point for PoliVisu's Toolbox content
18	Visualising Cities	An open platform for urban visualization projects	Urban data	The platform is just a hosting space for different visualisation projects around the world. PoliVisu could consider becoming a similar space post-project, which can help ensure its popularity among urban developers, visualisation experts, city policy makers
19	Automating data visualisation	UK research project is researching novel methods for data layout and representation in the visualisation of 3D/4D digital twins that exploit the power of cloud computing.	Data for digital twins that use 3D/4D (spatio-temporal) data	The UK project shows that possibilities for data visualisation are endless. Cutting edge visualisations can now be presented in four dimensions (4D) and the visualisation process itself can be automated
20	Urban API	FP7 project - provide urban planners with the tools needed to actively analyse, plan and manage the urban environment.	n/a	There is demand for simulation tools that enable policy makers to understand the consequences of spatial planning decisions