DELIVERABLE

D7.7 Final Evaluation Report

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Executive Summary

This deliverable reports the final evaluation of PoliVisu and its pilots, with an eye on the activities of the last iteration, called “Impact”, and it reports the results of training and exploitation activities.

At the end of PoliVisu, it is possible to define how successful have been the activities conducted by the pilots and the project. During the last year of the project, the outbreak of COVID19 obliged pilots and project partners to adapt to the ongoing situation. This process was successful as the project and the pilots could work on digital tools with excellent results.

Finally, Polivisu was able to close its four pilots with interesting lessons learnt, to organize 4 webinars with important participation and a MOOC. Moreover, the project could publish a book about its experience in this project.

Concretely, PoliVisu was able to stimulate and valorize the use of data in policy making in its pilots as they could successfully deploy their scenarios and obtain outstanding results. PoliVisu made possible to have in Issy dashboard to evaluate the impact of new policies on mobility and a highly improved strategy about data, in Pilsen to adopt 3 of the project tools for the coming years and to make a big step forward, in Ghent a new data partnership with a mobile company and in Flanders to launch various projects with a real impact on mobility.

It was a long way, as all the pilots had to deal with various bottlenecks, but those helped them to improve their awareness of the importance of using data in policy making processes and through the use of tools and visualizations.

At the end of the project, it is possible to identify different bottlenecks and new uses that were met in the deployment of pilots and in the evaluation process, making it possible to propose various recommendations for the deployment of data and visualization projects in Cities and public authorities.

In particular, PoliVisu could benchmark the importance of data literacy, ownership of (useful) datasets, data privacy and jurisdiction, and data fragmentation, but it could also observe how Cities, once improved their awareness, have an upward trend.

Cities and public authorities may have a slow start, but, as soon as they start, they will be improving quicker and quicker with time. The improvement will also improve communication to citizens, making it also possible to unlock more and more funds, which will support the whole process.

1. Introduction

This deliverable is focused on the results of the four iterations of the project to benchmark the success of the project. It describes how the planned evaluation methodology and activities were executed and, with the support of Key Performance Indicators (KPIs), how the project has progressed, particularly to introduce the use of data in policy making processes in the pilot cities.

Moreover, this document focuses on the various lessons learnt during the implementation of the various activities and it summarizes the different results obtained by the pilots and the project itself, following the evaluation framework.

This framework defines a formative evaluation, composed by the different pilot cases, which feeds the overall project evaluation, called summative evaluation.

Concretely, this document shows the overall results of the pilots during the last 3 years in a short and consolidated version, proposing also a more detailed vision of pilots' activities during the last iteration in the annex.

Furthermore, this report proposes the final results of the training and exploitation activities conducted by the project mainly in the last year.

The result of the work, as described above and later in the document, was listed by the pilots and supporting project partners in clear recommendations to develop and implement a data-driven approach in policy making in mid-sized Cities and similar public authorities.

This document has four substantive sections:

- **Section 2**: presents the Formative evaluation and the activities conducted;
- **Section 3**: presents the summative evaluation conducted and the results achieved;
- **Section 4:** presents the final evaluation of the training and exploitation of PoliVisu;
- **Section 5**: concludes this document with a synthetic explanation of the achieved results and summarizes the unclogged challenges of the project.

Moreover, the document reports 3 annexes related to pilots' and training activities with more details, namely:

- **Annex I**: this reports the detailed activities of pilots in Impact iteration, this is reported also in deliverable "D6.4 Final Report";
- **Annex II:** this reports the detail of the surveys answered during the various webinars organized by the project;
- **Annex III:** reports details about the MOOC survey results.

2. Formative Evaluation

As reported in the previous reports, the Polivisu project assigns its evaluations to a methodology based on a distinction between formative and summative evaluations. Those are strictly correlated as formative assessment allows to obtain feedback on each iteration. At the same time, summative evaluation provides benchmarking and a clear picture of the project improvements iteration by iteration, as shown in figure 1 below.

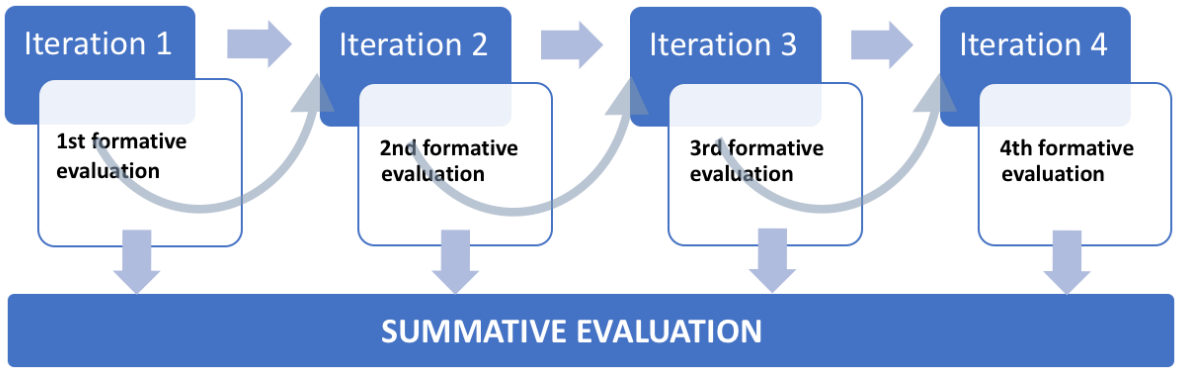


Figure 1 Relation between Formative and Summative evaluation

Consequently, this section, related to the Formative evaluation, reports the final results of the evaluation in pilots, with an interest also on the activities of the last iteration (fully reported in annex).

The overall evaluation of the project is enclosed in the Summative evaluation explained in the following chapter.

2.1 The 4 Iterations: from closed to impact

PoliVisu worked on 4 pilots, the original 3 (Issy-les-Moulineaux, Pilsen and Ghent) and the Flanders Region (including also the City of Mechelen). This work made the actual development, implementation and monitoring of local policies in 4 cycles, feeding the results back into the overall project's solutions (called summative evaluation). The four iterations framework worked on the following scheme:

- closed iteration;
- lab iteration;
- open iteration;
- impact iteration.

The pilot cities chose similar policy challenges (as reported in D6.1) but are highly diverse in terms of decision making processes.

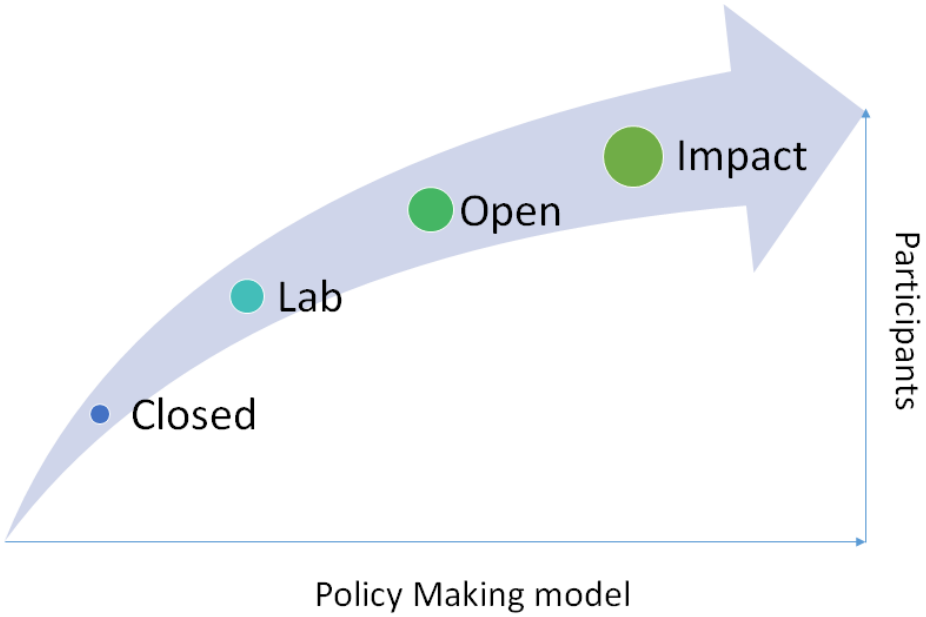


Figure 2 Increasing scale of living lab activities in pilot cities

The results of every iteration were reported time by time, in the following paragraphs report the results of the pilots of PoliVisu during the whole project.

Table 1 Number of participants per pilot per iteration

Pilot vs. iteration	Closed	Lab	Open	Impact
Ghent	12	52	124	29
Pilsen	54	124	403	350
Issy	34	68	362	1.048
Flanders	0[1]	0[2]	67	516

It can be clearly stated that pilots could engage an important number of participants and to have an important set of activities, making it possible to sufficiently evaluate the results about the use of data through tools and visualizations in their policy making processes. The detailed lessons learnt of those single pilots are reported

[1] Pilot's evaluation in Flanders started later due to the status of non-partner of the involved Cities
[2] See note above

in the "Policy implementation and compliance report"[3] and a detailed benchmark is provided in the Final Report of pilots[4], the following paragraphs propose a short version of the situation per pilot.

2.2 Ghent

As planned, Ghent worked to provide the self-service visualization tools for policy makers and civil servants to properly interpret and use the data about the hidden populations (cf. the students) within the city. Furthermore, a more open discussion with different stakeholders, like the students themselves, the different thematically involved departments and the public, was planned for the last iteration of the PoliVisu project.

Due to the limitations posed by the outbreak of COVID-19, the city of Ghent had to change its plans for the final iteration. The focus shifted towards perpetuating the relation between the telecommunication data provider, Proximus, and the city.

Physical meetings/brainstorms with students were made impossible due to lockdown, so Ghent started to invest its time in raising the awareness of the use of (big) data for different city services (like tourism, economy, …). By sharing our insights and lessons learned; other city departments were made aware of the possible pitfalls and opportunities that (big) data has for them.

Ghent also invested more time into investigating the data quality of the Proximus telecommunication data. A second 'data-iteration' was done during the previous pilot-iteration which lead to new results and insights for the city. However, the Ghent team was not satisfied with the delivered datasets. This is why the office for data & information invested its time in (re)formulating the data question towards Proximus in order to obtain more detailed and more usable datasets that could give better answers to our initial questions.

The starting scenario

Back in 2017, when the project started, the City of Ghent had about 75.000 students that were following a higher education (university or university college) in Ghent. Now, at the end of the project, we see that more than 80.000 students are present in Ghent. It is safe to say that, even with COVID-19 going on, the student numbers are growing every year in Ghent. With an inhabitant number of around 260.000; it is clear that this student population forms a large part of our city and therefore also determines what the city looks and feels like.

This is why the project mainly focused on the impact of this student population. Initially, Ghent aimed to carry out 3 different data management scenarios (as stated in D6.1); starting with the mapping of the student housing. Once we knew where the students were living (*Cf. students are not obliged to register their living place in Ghent)*, Ghent would continue to investigate their impact on mobility and economy. Without the (estimated) geolocation of the students' living space, it would be nearly impossible to start investigating their mobility patterns or their economical contribution to the city.

[3] D6.3 Policy implementation and compliance report
[4] D6.4 Final Report of pilots

In the first scenario there were 4 action points listed by the city:

- combining of the existing datasets;
- telecommunication data;
- energy usage data;
- self-registration of the students.

The combination of existing datasets was carried out during the first iteration and resulted in the conclusion the existing data sources are insufficient to identify the locations of the dorm students. During the second and third iteration, there were discussions with Fluvius (energy company in Ghent) about the options of using the energy usage data; but it became clear that this was not an option due to privacy reasons.

During the first iteration, there were some first brainstorms with Proximus about the possibilities of using telecommunication data to identify dorm locations. The discussions became more and more concrete and a first data iteration was organized. In June 2019, a first result was delivered by Proximus containing the first results of dorm students.

During the following months and iteration, the focus of the Ghent pilot shifted more towards this kind of (big) data source, because it showed the most potential for the PoliVisu case. It also gained a lot of attention from other city departments (like the tourism department, festivities department, …), which resulted in a closer collaboration between Proximus and the city of Ghent. Due to the complexity of this dataset type, a lot of (virtual when COVID-19 started) meetings were organized to clarify difficulties and obstacles.

Final Evaluation

Ghent worked through the 3 years on its scenario deployment through various activities, mainly based on focus groups, brainstorming and workshops.

With this agile structure, the City could set an important collaboration with Proximus and it could involve various departments of the City, namely the housing department, the department for education and the office for tourism. This created a real virtuous cycle making it possible to deploy the initial scenarios and to improve it in the co-creation process with all those actors.

Due to this co-creation logic, during the deployment of its pilot, Ghent could go through the main barriers that they met, in particular, the access of useful data was complicated due to a lack of public datasets (too fragmented) and IPR restrictions to access the private ones.

Moreover, the co-creation process allowed to have a tool, constructed with Proximus, which became more and more useful for Ghent. Also, the usability and usefulness could be confirmed, thanks to this collaboration which will be lasting after the end of the project.

2.3 Pilsen

During the entire period of the project, Pilsen aimed to develop tools to support decision-making processes in connection with mobility in the city. The works in the first three iterations identified the input data for implementation into new programs, i.e. tools for analysing traffic problems in the city.

Pilsen, as planned, has focused both on user training and that the developed applications can serve the specific required purpose, but could also be used to solve other tasks. For this purpose, the 4th cycle was to take place mainly in an open audience composed of potential users, which allowed the pilot to collect feedback.

The COVID-19 limitations meant that not all meetings with users were possible to organize face-to-face, and so they were partly replaced with other methods (webinars, electronic communication). On the other hand, the situation offered other opportunities. The tools developed have become excellent tools for presenting the impact of a state of emergency on traffic.

Processes of improving traffic, ensuring greater mobility and safety in traffic are part of the long-term concept of Smart City of the city. Therefore, the city has been involved in further development and improvement in TRAFFO and DUET projects with tools developed by the PoliVisu's consortium.

The starting scenario

Due to the fact that Pilsen is a transit city and its geographical and socio-economic layout is not ideal, there is a significant complication in the field of traffic. Both in the growing number of congestion and in the security question. Measures that should help to improve the situation are included in the Sustainable Urban Mobility Plan (SUMP).

Therefore, the city decided to create tools within the project, based on previously unused available big data sources and to be used for more effective policy making in the field of traffic planning. Pilsen has been thinking in particular to the identification of traffic-wise problematic localities, more effective planning of road constructions, modelling of the impacts of the measures taken, improvement of coordination in the permitting of traffic roadworks and closures. The developed tools were implemented in the decision-making processes of the city. The primary goal was to improve the traffic situation, which subsequently had to improve living comfort in the city. Public awareness and involvement were also be taken into account.

Final evaluation

During the last 3 years, Pilsen worked on an ambitious plan, related to 4 scenarios highly focused on roadworks and traffic management, which was based on the use of various workshops as evaluation tools to confirm the effectiveness of the adoption of tools and visualizations around data.

With this agile structure, SITMP could involve the City in effective use of the tools in policymaking.

The outstanding results of this pilot has been the adoption of 3 tools (The Map of Traffic in Pilsen, The Pilsen Traffic Safety Map, Traffic Modeller App) which confirm a full acceptance, usability and usefulness of those tools created by the project.

It has to be highlighted and noticed how Pilsen was able to work in a real co-creation perspective during the whole project as hundreds of stakeholders collaborated and different bodies could participate and contribute in the development of the tools.

This co-creation process allowed Pilsen to go beyond various barriers, such as the fragmentation of competencies in the public sector and a lack of data literacy, also thanks to training activities conducted in the field.

2.4 Issy-les-Moulineaux

In the last 3 years, Issy-les-Moulineaux worked in consolidating its achievements and to further improve its strategies in use of data in policy making.

It has to be noticed that this work was based on 3 focus groups that were identified in the first 3 iterations, which were adapted to the situation according to the outbreak of COVID-19 which didn't really allow physical activities. Consequently, Issy, strongly collaborating with MyAnatol, implemented online activities to make available data tools and to improve the local data strategies, also from a policymaking point of view.

As reported in the previous application, Issy was working on a street marketing campaign, but this was suddenly stopped by the lockdown and limitations introduced after it.

This interruption did not discourage the City and My Anatol, who started working on data analysis: using the very specific situation of lockdown to better understand mobility practices and issues, also relying on the first experience carried out in 2019 as part of the PoliVisu project.

A scoping phase made it possible to identify the most useful places and axes, My Anatol created a dashboard which allows traffic data to be analysed on the main axes. But the analysis of cars alone was not enough in a period that sees an increase in measures in favour of bicycles, so this use was added to it.

This represents a shift in the initial scenario, as explained in the following paragraph.

The starting scenario

Issy-les-Moulineaux, due to their location and economic vitality, are heavily impacted because many people from the whole Paris area come to or transit through Issy and GPSO for work, very often by car.

The launch of the project "Grand Paris Express", one of the most ambitious in Europe around mobility, was made in 2017, to lead to the construction of an automated metro in the Paris Region up to 2030. This project, aiming at improving the public transports offer, was considered as potentially negative on mobility and traffic during its construction.

The main objective of the pilot was to estimate the impact of the roadworks as it could influence many areas

of the urban agglomeration.

Based on the current situation, the different policy themes/issues to be targeted focus on:

- Acceptability of roadworks due to major transport projects;
- traffic management;
- multimodal shift;
- information and communication to drive new and better uses of transport services;
- definition of new transport services.

Those pillars were kept all along the pilot, but a shift came in 2020, as the Grand Paris Express roadworks, also thanks to the studies done on the dedicated dashboard, showed not to have a significant impact on congestion, also due to the measures taken to reduce the duration of parking to discourage the working visitors to come by car.

The outbreak of COVID19 and the related lockdown made necessary, once this one was going to end, to find solutions to help people to reduce the use of public transports, to avoid crowds, and, at the same time, to avoid a massive use of cars.

To help users, the City and whole urban agglomerations started to invest in temporary bike lanes and infrastructures. In parallel, the City works with its partners on a bike plan to make those final.

In this respect, during the introduction of the temporary infrastructure, the City monitored the change in the use of bikes (on 2019 basis) to make sure to evaluate existing measures and to improve them for the final ones.

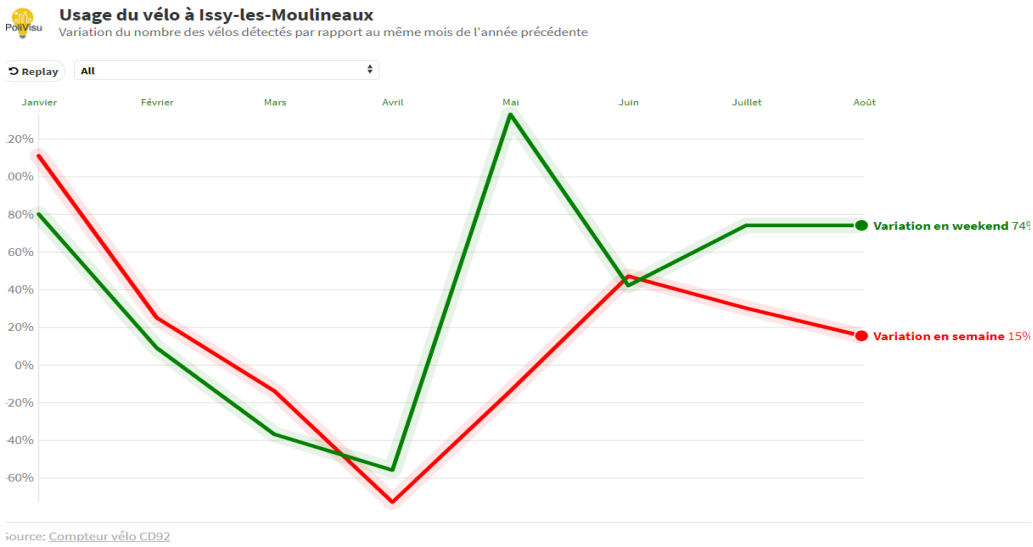


Figure 3 visualization made to evaluate use of bikes in 2020 (on 2019 basis)

Final Evaluation

During the 3 years of the project, Issy-les-Moulineaux worked on a scheme based on 3 main focus groups, which represented over time a reference in deploying the scenario. Those were:

- *An urbanism Focus Group*, composed by 4 entities: the City of Issy-les-Moulineaux (urbanism and sustainable development departments), the Urban Agglomeration Grand Paris Seine Ouest (GIS and mobility departments) and the company Be Mobile[5].
- An information and communication Focus Group, composed of the Issy Média team (responsible of the whole communication of the City and on top of Open Data portal visualizations), highly involved in finding good visualizations/tools to allow to link policy making and population;
- A data Focus Group, composed time by time by various bodies (public and private)

This scheme allowed Issy to deploy successfully its pilot and to overcome the various barriers that it met over time. In particular, Issy had to deal with a lack of useful data (due to ownership and fragmentation) and to fragmentation of competencies.

The use of co-creation processes and the various workshops organized on the framework of those groups allowed it to obtain useful data and useful tools, including important feedback to improve the tools.

The success was confirmed as it was created an almost fully usable dashboard[6], in collaboration with a local startup, useful to evaluate the impact of COVID and bike policies on the use of mobilities. Finally, the various applications[7] that saw the light in the last year represent a real proof of the improved approach of Issy.

2.5 New pilots: Flanders Region, Mechelen, Voorkempen, Solva

One of the most important successes of PoliVisu has been the involvement of some additional pilots. The support of some partners[8] allowed to identify and to involve 4 of them during this first iteration, making the role of these 3 additional pilots, even if some obvious limitations, to support the project.

The 3 pilots identified, the Cities of Mechelen and Kortrijk and the Flanders Region, worked on specific scenarios and use cases allowing to have a wider spectrum in terms of feedback.

Despite Covid-19 and to some extent different timing than the other three pilots (with later testing and delivery periods), the new pilots have achieved quite some impactful results.

[5] At the time, the company was called Mediamobile, which was then bought by Be Mobile (late 2018)
[6] This is fully usable, but it was still defined a “but too technical” by the City policy makers.
[7] See balades.issy.com and trier.issy.com, moreover a City dashboard will be published soon (see paragraph 3.1)
[8] Namely, AIV, GEOSPARC and Macq

Scenarios

The Flanders region worked on various scenarios that involved various municipalities and/or public authorities:

- For the Flanders accident map pilot, the activities were mainly focussed on the existing visualization and product. Two types of actions were taken: Improving data quality and data processing alignment and updating the accident map data.
- The Mechelen schoolstreet project has been rolled out in one school on the 1st of March after a week off. The Covid-19 lockdown half March jeopardized the possibility to have a long measurement period and also made it impossible to roll-out a second school. Nevertheless, the interest in the concept is still there.
- The Voorkempen average speed control evidence-based study of almost three years of pseudonymized data received a lot of attention from other police zones implementing average speed control zones. During iteration three, a first study, resulting in a presentation was made. In the last iteration, the PoliVisu consortium started to build a software solution as part of the Macq M3 platform, also integrating the InnoConnect WebGLayer based accident map.
- The SOLVA regional commuting case is based on the TomTom floating car data and the TomTom move platform. PoliVisu/Solva was the first test case in Flanders of the platform as a mobility and smart-city tool.

Final evaluation

The pandemic made hard a full evaluation due to the more restricted time of those pilots, but, as described above, those pilots could achieve results. The tempered evaluation was based on a meeting scheme to gather needs and feedback from the various Cities and public authorities involved.

The positive results, particularly from a co-creation point of view, is clearly defined by the involvement of the public authorities, but also of private ones like Telraam which made possible to have a particularly interesting pilot in Mechelen, involving also private citizens support.

3. Summative evaluation

The formative evaluations of the various pilots of the project make it possible to have summative evaluations and to benchmark an overall judgment of the project.

The four iterations were implemented through the methodology and the process reported in the evaluation plan without major deviations. Moreover, KPIs, as reported in Table 2 below, were mainly met, as all pilots could meet the due KPIs, in parallel also the project activities were satisfactory, and they could meet the expected numbers.

Anyway, it needs to be noticed that plans had to be adapted during the last year due to COVID, but this didn't negatively impact the results of the project.

As reported in the previous deliverables, the pilots, and the project as a whole, could engage a remarkable number of participants making clear how useful and interesting are considered the data visualizations and the tools, with particular potential in the policymaking processes. In all pilots, with various degrees, the project has increased more and more the awareness of the importance of using data in policy making processes and through the use of tools and visualizations.

It has also been noticed how data can support the evaluation, as the anonymized data created by the tools in itself makes to have a clear view on the usefulness possible.

At the same time, the project detected a particular difficulty to evaluate the policy making model[9] and the usefulness and acceptability of tools (due to the number of tools), but this could be solved and it is possible to read, in the following paragraphs, how the model and the tools had a positive evaluation through qualitative processes.

Table 2 Status of the Summative evaluations KPIs

ID	Outcome	Success criteria (KPI)	Final Results
A) The *acceptance of the tools* used to make big data useful to the policy-making process			
A1	Number of surveys	40	336
A2	Acceptance of the model	80% overall	High
A3	Usability of the model	90% overall	High[10]
A4	Expert lens interviews	20 interviews	28[11]
A5	Acceptance of the tools	80% overall	Full
A6	Usability of the tools	90% overall	Full[12]
B) The effectiveness of big data use at a policy level			

[9] See D7.5 Recommendations for future deployments 3 (par. 3.3)
[10] See paragraph 3.3
[11] Policy makers in Ghent (23/10/2019), Pilsen (23/05/2019) and Issy (30/01/2020) and Issy fourth iteration. Overall feedbacks are about 200.
[12] See paragraph 3.1

ID	Outcome	Success criteria (KPI)	Final Results
B1	Necessary data has been mapped	15	19
B2	Stakeholders collaborating	100	889[13]
B3	Policies explored	30	11
B4	Policy decisions	12	3
B5	Trainers trained	3	12[14]
B6	Training events	2	4
B7	People trained	20	59[15]
B8	Satisfaction of trainers	90% overall	100%
B9	Satisfaction of trainees	90% overall	100%
B10	Increased understanding of trainees	90% overall on skills improvement	100%
C) The transferability of the PoliVisu tools, methods and processes			
C1	Clarity of the impact of the tools	70% overall	89,7%
C2	Success stories	3	14
C3	Follower cities	3	3
C4	Cities contacted	300	311[16]

[13] This figure may not correspond to the sum of the total number of participants per iteration as this is a "unique users" figure, then the same participant to various activities was counted just one time. Moreover, people participating passively, mainly in the last iteration, were not counted.
[14] Partners involved in those and trained
[15] 27 had a certificate as they fully completed the MOOC
[16] Engaged via different channels: surveys, physical events, webinars, online course, mailing list

ID	Outcome	Success criteria (KPI)	Final Results
C5	Business plan	Tested by partners and potential end users (3 external experts)	YES (ALL+3 external experts)

3.1 Usefulness of tools and visualizations in policy making

At the early stages of PoliVisu, the project made the choice not to concentrate on a single platform, but to work on various tools and visualizations in all pilots. This had an impact in the evaluation of acceptance, particularly on the KPIs related to it.

An evaluation tool by tool was done in iteration 3[17], after the final evaluation it is possible to make a deeper analysis to see how tools can affect policy making.

The tools created in a research project cannot, of course, all be adopted, otherwise, we would be in front of something unusual. At the same time, a successful project will see the users to adopt similar tools if not the ones of the experimentation.

This is what happened in PoliVisu, the various projects that saw the light in the various pilots during the final year of the project represent a real proof of the positive impact of the project on their daily working life, with a particular interest in policy making.

If in Issy, the City invested in various applications to help the population to better accept policies that often have an average participation like waste management, it has also been working on a well-articulated dashboard, matched with KPIs, to help policy makers to follow the work of the City departments.

Figure 4 Dashboard done by My Anatol in Issy (cover page)

[17] See D7.5 Recommendations for future deployments 3

Moreover, the dashboard created with MyAnatol, hosted by Issy open data portal[18] is used by the city to follow the people's behaviors, this is key in a period in which uses can quickly change.

In Pilsen, the City has fully adopted (by signing commercial contracts with providers) two traffic intensity-related tools developed and tested in PoliVisu (Map of Traffic and Traffic Modeller). The applications allow to analyse the traffic volume in the past and in the present in places where traffic detectors are located. The Traffic Modeller furthermore visualizes the expected development of traffic in the future based on the traffic model and scheduled road closures. The tool to compare the traffic on different dates (allowing to compare both historical sensor data and future predicted traffic) has also been appreciated by the city traffic experts. The application also allows city experts to experiment with different scenarios before introducing any traffic restrictions or for the purpose of new roads planning. The outputs from the impacts of the proposed measures may influence the policy of the decision of the political representation in order to improve traffic in Pilsen. Both applications are fully available to the public for an understanding of the taken measures. The Pilsen Safe Roads map was furthermore developed for the use by the city security-policy makers, municipal police and state police. These users especially appreciate the interactive analytical capabilities of the map and that for the first time the data on traffic accidents, traffic offences and average speed control zones have been made available in a single interface.

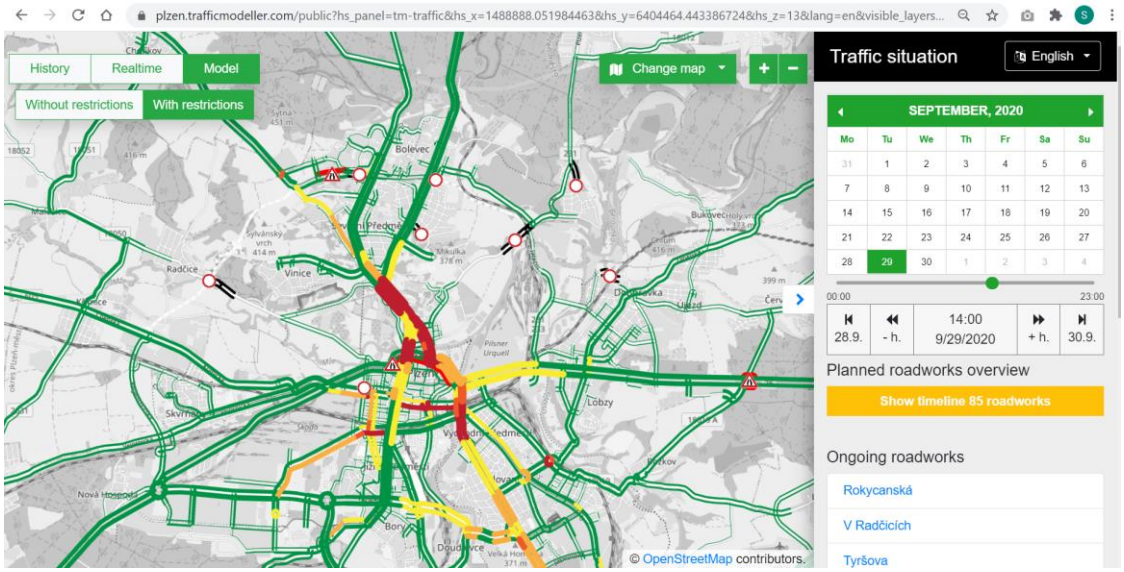


Figure 5 Traffic Modeller in Pilsen

In Ghent, visualizations have been made and analyses have been performed with the Proximus data. Hereby several departments were able to incorporate the data in their policy making process. Furthermore, this resulted in other departments throughout the city being more open for (big) data obtained from external companies.

[18] https://data.issy.com/pages/myanatol_tbd/

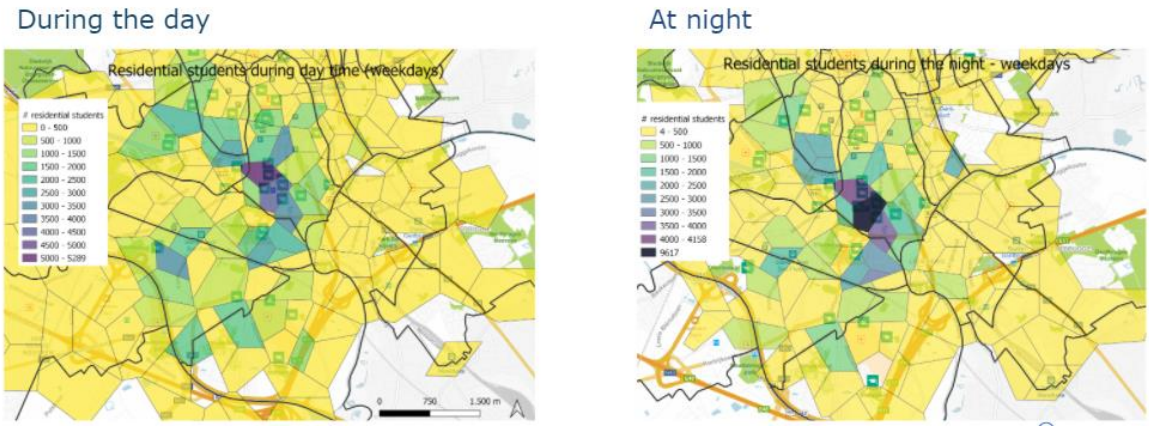


Figure 6 Screenshot of the application of Proximus in Ghent

3.2 Use of Big Data in policymaking

The examples reported in the previous paragraph are important and useful also to explain how PoliVisu helped the various Cities involved to improve its strategy around data and to adopt a more data-oriented approach in its policymaking processes.

As already mentioned in various previous documents of PoliVisu[19], in the various iterations the effectiveness and the readiness of public administrations to the use of big data in policy making were already investigated.

If during the first two iterations, the project mainly analysed the impact of co-creation processes and data, on various facets, the two latest iterations made possible to involve a wider public.

All along with the project, it was possible to involve a number of users that is just short of 1.000, which is impressive. This participation was fully evaluated by every pilot, as reported in chapter 2, but it is clear how, if dedicated actions for recruitment are taken, many people are ready to participate.

However, the first results showed also how the population is particularly demanding on tools, consequently a large number of users may drop quickly if the tools and/or visualizations do not totally correspond to their needs. As already stated in previous reports, the involvement of a common audience is one of the most complicated results to achieve for a project of this kind[20].

Furthermore, as reported in the previous reports, the various iterations "*confirmed the most critical points about data and co-creation. In fact, some of the points raised were better declined:*

- *Data is often requested as historical by the public administrations, but, as it was already raised by Pilsen earlier, also the pilots of Issy and Ghent confirmed that this is true, but this data needs "real-time or short time update".*

[19] D7.2 Recommendation for future deployments (Iteration 1), D7.3 D7.5 Recommendation for future deployments (Iteration 2), D3.8 Data driven policy making: pitfalls and suggestions for Public Administrations
[20] D3.8 Data driven policy making: pitfalls and suggestions for Public Administrations

- *The lack of owned real-time data puts Cities in the uncomfortable condition to negotiate with data owners that, by the way, often have just part of the useful data. Being often obliged to negotiate with data owners without a clear vision of the data may represent a risk. Whenever data is given for free, as it happens in Ghent, its use can be heavily limited, particularly for co-creation actions with citizens.*
- *Competences distributed between various bodies in mobility and transports can be a blocking point for Cities as data or related models (like traffic models) can in some cases be locked or unusable.*

Those limitations represent a real limitation to use of data or even just to create a useful visualization for policy making purposes, giving limitations to the use."[21].

3.3 The Policy Making model acceptance

The previous version of the policy making model acceptance evaluation[22] analysed if and how, at the end of the third iteration of the project, the pilots had internalized the model in their data-based policy making experiments.

Even now, at the end of the fourth and last iteration, the policy cycle model confirmed to be a reference for the public administrations involved in PoliVisu. In fact, from one side, the model allows to orient data-related activities of pilots within their policy making initiatives. From the other, it helps explore and evaluate *a posteriori* the validity of their approach and their ability to extract value from data.

The last aspect is at the centre of this section of the final evaluation report, in which the pilots' experiences are briefly reconstructed and contextualized with respect to the structure and objectives of the policy making model. Thanks to this approach, it is possible to analyse and assess the compliance of the activities implemented by the pilots with the principles that structure the model and that are at the basis of an efficient data supported policymaking approach.

In line with the previous version of the acceptance evaluation, the criterion for the assessment will be based on three levels of compliance:

- Awareness of the opportunities offered by the data in the three main cycles of policy making (design, implementation, evaluation);
- Adoption of an attitude towards experimentation and learning;
- Promotion of co-creation, or the extent to which data leads to the collaboration between several actors in the decision-making process.

Considering that the fourth iteration coincided for the most part with the lockdown period, the evaluation should necessarily take into account the impacts of the COVID-19 pandemic on the activities of the pilots and the possible reconfigurations of their objectives. Moreover, it analyses if and how the pilots have been able

[21] See D7.5 Recommendations for future deployments 3 (par. 3.2)
[22] See D7.5 Recommendations for future deployments 3 (par. 3.3)

to seize, in this dramatic moment, the opportunity to redirect their data-supported explorations to respond to new and unprecedented problems, thus testing the flexibility of data and visualizations even in conditions of deep uncertainty.

The **first level** assesses the pilot's ability to frame its work within the policy making model and define a coherent and flexible strategy to exploit data. This approach requires the ability to develop deep reflections on the role of public administration in the digital age, on the impact of data in policy making (what opportunities/challenges does data generate to make policy process more efficient?), and at the governance level (how does data redesign the relationship within a decision-making structure and toward the outside?). In this project, it is possible to qualitatively assess this level of compliance based on the active contribution of each pilot to (i) the evolution of the model through the exchange of reflections, discussion, and active engagement, and (ii) the ability to understand that the model should not be considered as a simple checklist, but a framework to stimulate the creative innovation of public administrations.

Among the pilots, Ghent has contributed significantly to the evolution of the model by proposing relevant reflections about the new data-related activities for public administrations, offering relevant insights on the role and interactions of the manifold actors that should be involved in data-supported policy making processes.

Exchanges with Issy-les-Moulineaux have provided essential insights into the effects of data on governance and on the functioning of public administration.

Moreover, during the last iteration, Issy was able to create the ideal conditions (multiple actors involved, different expertise, complex problems to be solved) to test, in a concrete case, the usefulness of the model and the data in policy making, as it happened in the design, implementation, and evaluation path for the municipality's pro-cycling measures for the post-COVID 19.

Finally, Pilsen kept the focus on developing and improving data-based visualization tools to support the city’s mobility policy making process. Thus, the pilot is in a testing stage of technical tools that, in perspective, may produce relevant outcomes but, for now, makes its experience less decisive in the contribution to the discussion on the policy making model and its development.

Considering the **second level**, the criterion of evaluation can assume, in this case, a quantitative/qualitative dimension, taking into account the number and characteristics of the experiments conducted by each pilot and the lessons learned following implementation. For each pilot, therefore, it will be possible to provide the evaluation considering, on the one hand, the performance for each KPIs related to experimental activities carried on by the pilots and, on the other hand, to qualitatively assess how these experimentations have been determinant for the progress of the pilot's activities.

Among the pilots, Issy-les-Moulineaux worked on multiple fronts in a synergic way, taking advantage of the experiments it is implementing to test new policy making approaches and to establish relationships with different partners. This dynamic was particularly relevant during the COVID-19 pandemic: thanks to the

continuous collection of data, the city could reorient its data exploitation agenda and create a multi-level dialogue involving data providers, technical partners, and decision-makers with the mediation of Issy Media. In this way, Issy has demonstrated that data-based experimentation helps to make the response to problems more dynamic, training public officers to be more proactive and responsive.

Pilsen is in a pre-experimental phase, where the goal is to develop technical tools to be adopted in future experiments. During the last iteration, the pilot was able to focus and re-orient its activities to analyze and understand the impact of COVID-19 on the city's traffic system, showing the ability to readjust its objectives and to catch the opportunity to test its tools in extraordinary conditions, acquiring experience and knowledge that will be useful for future experimentation and uses of the platforms.

Ghent is also in a pre-experimental phase, where the goal is to explore the opportunities and difficulties related to the use of data and build know-how for future data-based experiments.

Finally, the **third level** assessment can also be carried out in quantitative/qualitative terms. The propensity to co-creation can be assessed by considering, for each pilot, the performance for each of the KPIs referred to the activities involving several actors (workshops, design sessions, and training). This criterion can then be combined with a qualitative evaluation to certify how the co-creation activities have been relevant in achieving the project's objectives.

Among the pilots, Issy-les-Moulineaux involved several actors of different nature, both internal and external to the organization, in the design and implementation of the current experiments, showing the highest compliance at this level of the model. During the last iteration, this ability was further strengthened thanks to the direct and fruitful interaction between data providers, technical partners and different sectors of the administration. The pivotal role of IssyMedia is also relevant, confirming the importance of a central actor (the smart city department) able to mediate between different points of view to create the necessary conditions to facilitate the whole process of interaction.

Ghent focused mainly on the relationship with a main external partner (Proximus) while involving other actors in the data exploration path.

Pilsen tested the effectiveness of the three tools by collecting feedback in open testings, thus adopting a vision of co-creation based on the update of already designed technical tools according to users' responses. During the last iteration, this attitude was confirmed following the close collaborations with relevant actors, such as state and local police and different levels of the public administration.

As proposed in the previous version, each pilot's evaluation has been done by establishing a scale of compliance with the policy making model (e.g., very low, low, medium, high, very high). This assessment is done either in a disaggregated way, considering the three levels separately, and later on transformed into a synthetic indicator that qualifies each pilot.

Table 3 Final evaluation of Policy making model in Pilots

Pilot	1st level	2nd level	3rd level	Compliance
Issy	- full awareness as per policy design, implementation and evaluation	- good attitude towards experimentation	- very good promotion of co-creation	**very high**
Ghent	- full awareness as per policy design, implementation and evaluation	- good attitude towards experimentation	- good promotion of co-creation	**high**
Pilsen	- full awareness as for policy design and assessment - low awareness for policy implementation	- good attitude towards experimentation	- acceptable promotion of co-creation	**medium-low**

Still, it is worth to account for one more important aspect. The analysis of the pilots, carried out in continuity with the implementation of their activities, suggests that a high level of compliance with the policy model is not a sufficient condition to ensure the adoption of an institutionalized and efficient data-supported policymaking approach. The model can be considered a tool to orient pilots in the complexity of policy making processes by exploiting data-related opportunities better. However, for these activities to occur, it is necessary to consider the potential resistance of each context's political culture. Indeed, the role of governance systems is crucial in promoting paths of digital innovation and creating the conditions for such experimental activities to take place. Without these assumptions, it is thus possible that the model cannot be fed, and innovation cannot take place.

4. The Final evaluation of training and exploitation

PoliVisu, next to the activities and the related evaluations conducted in pilots, worked on ambitious modules to raise the awareness on data in policy making and to improve the readiness and the data literacy in its pilots and beyond.

As highlighted in this project, this is one of the key points to improve the use of data in policy making. To this end, PoliVisu has organized the above-mentioned training modules.

Those, matched with the activities conducted by pilots and the project with other public authorities and companies, allow for good feedback about the *commercial value/transferability* of the tools and visualizations and *the potential adopters* of the solutions.

More deeply, this section tries to benchmark the results obtained in engaging stakeholders with a clear interest in data and policy making.

4.1 Training

As reported in the planning, In the final year, PoliVisu rolled out an ambitious training program comprising webinars, workshops and an online course. The goal is to share accumulated results and lessons learned with potential adopters that want but don't necessarily know how to use advanced visualizations to make better policy decisions. Due to COVID-19, face-to-face events were put on hold, but the other two activities went ahead as planned.

Between May and October 2020, PoliVisu organized four webinars on the main themes explored during the project:

- data challenges (first webinar);
- dynamic visualizations (second webinar);
- traffic modeling (third webinar);
- experimental policy making (last webinar).

All recordings are stored on the PoliVisu YouTube channel.[23]

Both webinars and the online course were assessed using a range of evaluation techniques, as well as by looking at different performance metrics.

4.1.1 Webinar

As planned, the webinars provided a direct opportunity to connect with potential adopters, share key insights and continue the conversation long after the event has finished.

[23] https://www.youtube.com/channel/UCfXeCYou3ezyttWNYWTyQ0A

Figure 7 Webinar banner used for social media and invitations

Due to the costs related to software, the evaluations of webinars was conducted through 4 KPIs:

- *Registrations:* They are not a direct measure of impact but can help the training team monitor the success of communication efforts and adjust the tactics if the numbers are low. The number of registrations (more than 250) showed a good penetration rate of the project as an average of about 70 registrations per webinar as registered.
- *Attendance:* Attendance is related to impact, even if it cannot be considered a real interest without the support of other KPIs. In this case, we can say that the participation was good as it passed the 50% of registrations (with about 150 participants).
- *Participation:* Participation can be measured through the attendee engagement (e.g. chat interaction) and is generally a useful indicator of webinar's success. It shows whether the audience is engaging with content, whether ideas presented make sense to them, whether people are keen to know more. This was well above 70% which made clear the success of the webinars.
- *Feedback:* The best way to measure the webinar's success is to ask the audience directly after the event. As above, participants gave really positive feedback.

Table 4 List of webinars

Date	Webinar title	Registrations	Participants	Feedbacks
19 May 2020	*How to overcome data challenges in transport policy making? Lessons from the PoliVisu pilots*	74	38	31
23 June 2020	*Dynamic visualizations for Analysing Road Accidents and Traffic Conditions: The Case of WebGLayer*	61	25	18
8 September 2020	*Measure | Visualise | Reroute: Make your city less congested with Traffic Modeller*	67	49	27
22 October 2020	*The experimental approach: reinventing policy making in the era of data*	49	29	4
Total		**251**	**141**	**80**

4.1.2 MOOC (Massive Open Online Course)

The MOOC of PoliVisu was released on 21 July 2020 and it could experience, quite quickly, a good attendance.

Figure 8 MOOC flyer

At the time of writing[24], 68 learners enrolled in the course, of which 12 received a certificate.

A range of indicators was developed to capture participant background, participation, achievement and quality. Some of these were assessed using surveys, others through the MOOC platform (OpenLearn Create).

Table 5. Online course performance overview

Focus area	Indicator	Means of Verification	Outcome
Participant background	User demographics	Gender[25]	M: 75%, F:25 %
	Social status	Education, employment etc.[26]	Mixed background
	Geography	Location[27]	No cities: 18
Participation	Engagement	Course views	2395
		Registrations	68
	Collaboration	Interaction on the forum, with other users etc.	80
Achievement	Certification	% learners acquiring certificates	17.6%
	Assessment results	Average assessment score	74.72%
Quality	Learner content	User rating on the usefulness of forum discussions	Somewhat: 87.5%, N/A: 12.5%
	Content material	User rating of activities and quizzes (1-5)	5 (25%), 4 (62.5%), 3 (12.5)
	Relevance	User rated the clarity of learning outcomes	Very: 37.5%, Somewhat: 50%
		User rating of course expectations' fulfilment	Fully: 37%, Partly: 62.5%

[24] October 13, 2020

[25] Subjective assessment based on person's name provided in the public profile

[26] Based on information provided in the forum discussions ("About You"). Among learners we have people who are master students, government civil servants, local civil servants, GIS experts, education professionals

[27] Based on information provided in public profiles and forums. It wasn't possible to establish location for all registered participants. The 18 cities also include regions: Lagos, Baden-Württemberg, Antwerp, Zagreb, Flanders, Rio de Janeiro, Knokke-Heist, Gent, Pretoria, Ljubljana, Amersfoort, Oulu, Mechelen, Cardiff, Brussels, Leuven, Groningen, Brugge

The course has four discussion boards (forums). These were actively used by learners to share their thoughts and experience with others:

- About you: 30 posts
- Data literacy: 18 posts
- Big data experience: 18 posts
- Policy co-creation: 14 posts

Learners have been able to provide feedback by completing a short questionnaire.[28] To date, only 8 used the opportunity to do so. See Appendix III for more information.

4.2 Exploitation

The *Business and Exploitation Plan* of PoliVisu "*reports on activities and results achieved during the third exploitation wave and the plans for supporting PoliVisu post-EU funding. [...] Whilst the third year of PoliVisu was a busy one [...] a handicap to achieving full commercial goals presented itself in the form of Covid-19. This unexpected crisis restricted face-to-face activities of the project. Planned European conferences and exhibitions were cancelled along with local meetings. PoliVisu reorganized its work to be carried out as much as possible online, and focused much commercialization efforts into running webinars around the visualization tools and pilot outcomes, creating a book and developing an online training course.*"[29].

The effort done by pilots and by the project in training, as reported in the previous paragraphs and sections, created the basis for the evaluation of the commercial value of the tools of the project.

The work done in the project Cities and public authorities allowed also to have concrete examples of collaborations between public and private bodies to define the potential of those collaborations.

4.2.1 Commercial value/transferability of the tools and visualizations

During the webinars of the project, the various pilots have presented to the audience their scenarios and tools, also to receive feedback about the potential of their commercial value.

The various tools presented were:

- Visualization of the location of students, inhabitants and visitors of Ghent
- Traffic Modeller (public): Traffic intensity visualization
- Issy Traffic Dashboard and MyAnatol application
- Flanders Schoolstraten dashboard

[28] https://forms.gle
[29] D8.10 Final Business and Exploitation Plan

All those applications received a really high scores, while it was requested to users if those applications might be useful for other Cities or public authorities.

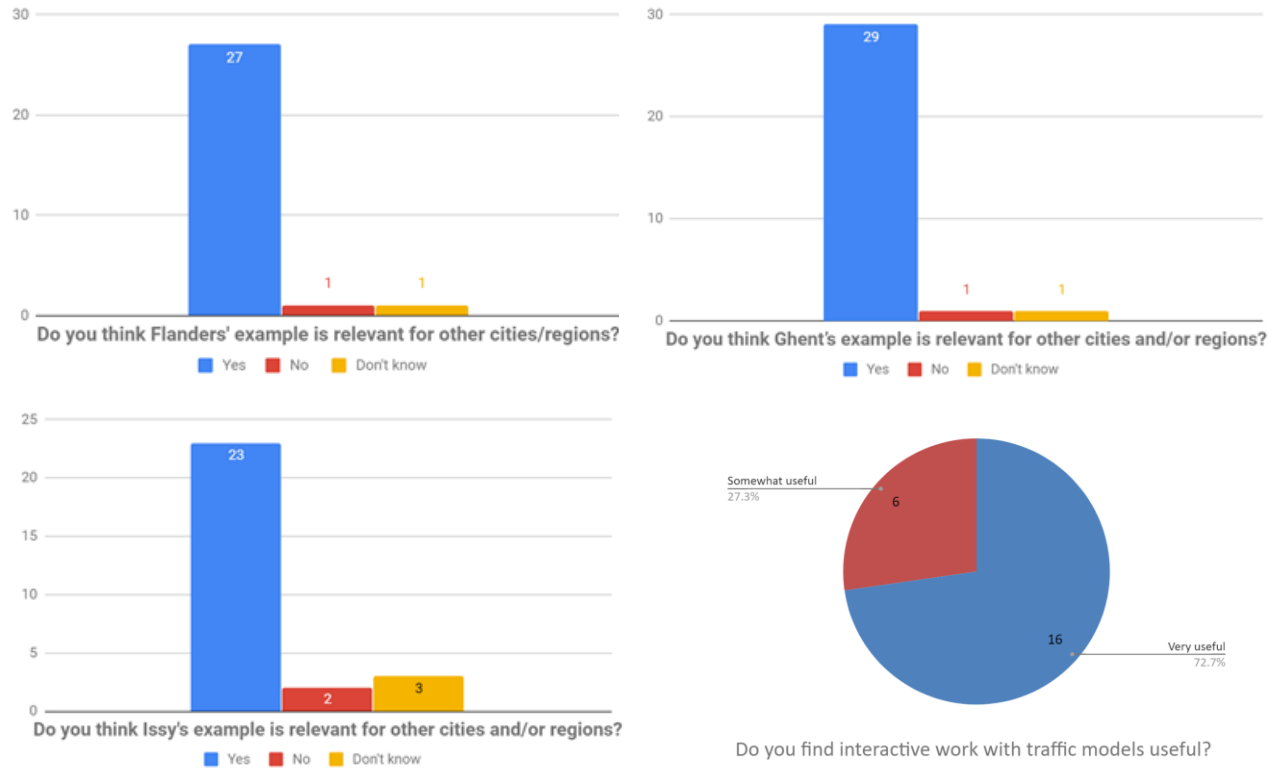


Figure 9 Answers about the potential of the pilots' applications

The scores went from 82% of Issy-les-Moulineaux to 100% of the Traffic Modeller, as it is reported in the various images below.

Moreover, as reported in section 3, the various pilots have adopted, or have been inspired by the project tools to adopt, tools to improve their policy making through data.

Moreover, data stories and the experiences of pilots have attracted many users. Issy and Pilsen have published, in the national language, their stories with hundreds of readers and followers. Those, about 1300 overall, showed a real interest in the tools and the use cases.

4.2.2 Potential adopters of the solutions

As reported in section 2 and paragraph 3.1, the successful deployment of the project is also clearly testified by some improvements in pilots in their policymaking processes and the use of data.

In Pilsen, some of the project tools were fully adopted by the City, while in Issy, Ghent and Mechelen some longer term relationships were set with local companies that supported on the project's pilots.

It is the case of MyAnatol and Be Mobile for Issy, Proximus in Ghent and Telraam in Mechelen. The collaborations with those companies showed a real and genuine interest in PoliVisu and its concept.

Moreover, the efforts done in webinars completed this in creating a real bi awareness in the public authorities' ecosystem, as it can be confirmed by the more than 200 cities that worked with the project during those 3 years. Actually, this usefulness and potential was confirmed also by the partnership that took place with the organization Major Cities of Europe which hosted PoliVisu in various workshops[30] and its annual conference[31].

Anyway, it can be clearly stated that any cities or public authorities with a profile similar to the Pilots of PoliVisu, mid-sized cities in Europe can adopt the scenarios and the tools used in PoliVisu.

The key point will be to respect and to pay attention to the points that are highlighted in chapter 5.

5. Conclusions: Success stories and future challenges for cities

During the last three years, PoliVisu has described the lessons learnt on the potentials of Big Data in policy making.

This happened in various documents[32]. Now, this chapter aims at wrapping up the whole stories of the project, underlying also the challenges still open in Cities about the use of data.

The different pilots of PoliVisu started the project with a high degree of knowledge about open data and

Figure 10 Success story of PoliVisu presented in Issy-les-Moulineaux

[30] Florence in January 2018 and Rome in October 2019
[31] June 2019
[32] See D7.6 Big & Open Data Use in Policymaking Manual (FINAL), D6.3 Policy implementation and compliance report and D6.4 Final Report

working with simple datasets. At the same time, they had the ambition, but limited knowledge on the use of big data and smart visualizations.

Gent, Pilsen and Issy-les-Moulineaux entered the project with some interesting scenarios, created without a real certainty about the possibility to really deploy them successfully. Additional to these pilots, a number of other pilots were engaged under the coordination of AIV, covering use cases related to problems experienced by various public authorities like regions, cooperation networks between communities, local police zones and cities.

All the pilots had to deal, during the process, with various limitations demanding rework on the additional scenarios to make them more effective.

Actually, in all pilots, the awareness of the importance of using data in policy making processes and through the use of tools and visualizations raised iteration by iteration. This wasn't just testified by numbers, but also qualitatively as all the 3 "original" pilots of the project could engage various policy makers, through dedicated sessions that represented just a first step.

At the end of the project, it is possible to identify different bottlenecks and new uses that were met in the deployment of pilots and in the evaluation process, as summarised in the table below.

Table 6 Lessons learnt in PoliVisu

Lesson learnt	Type	Ghent	Pilsen	Issy-les-Moulineaux	Flander[33]
Low Data Literacy	Bottleneck		X	X	X
Limitations due to ownership	Bottleneck	X		X	X
Fragmentation of Data	Bottleneck	X	X	X	X
Fragmentation of jurisdiction	Bottleneck		X	X	X
Data privacy issues	Bottleneck	X			X
Increasing awareness (data)	New use	X	X	X	X
Use of dashboards	New use	X	X	X	X
Co-creation projects	New use	X	X	X	X

The lessons learnt are strictly related to the deployment and the development of the pilots, representing the real step forward that this project has brought. The next paragraph reports about bottlenecks and lessons learnt and about the recommendations of the project for future deployments of similar projects.

[33] The Flanders pilots comprises the Flanders Traffic safety/accident map, the voorkempen average speed control dashboard, the Mechelen schoolstreet dashboard and the Solva South-Eastern-Flanders mobility analysis.

5.1 Bottlenecks and new uses detected in policy making

As explained, through the project the pilots needed to adapt their original ideas to the bottlenecks that they met, those created also new uses that didn't exist earlier in pilots.

5.1.1 Bottlenecks

Low Data literacy. According to the Data Literacy project[34], "*76% of key business decision-makers aren't confident in their ability to read, work with, analyze and argue with data*". The PoliVisu project investigated the issue of data literacy using its own survey[35] which confirmed this issue. At the same time, this was underlined by most of the pilots (all, but Ghent), at the beginning of the project, which declared not to have data scientists or analysts in their teams.

Limitations related to data ownership. All pilots had to deal with data ownership, but in two cases this is particularly true. Ghent and Issy-les-Moulineaux found themselves in a situation in which they had the obligation to get the data from private bodies, consequently to have real work to benchmark the market and to find affordable solutions. This is extremely time consuming and it plays a potentially negative role in the deployment of data projects.

Fragmentation of data. The first reported bottleneck, which was experienced from the two pilots of it and Pilsen, is also strictly related to the fragmentation of public data. Often the various municipalities and/or other public bodies do not share data or do not have compatible formats and policies. This is a real point as it makes data often exploitable and it can strongly impact deployment of projects.

Fragmentation of jurisdiction. The fragmented data is also related to a heavy division of competences between various bodies. This was particularly impacting Flanders and Issy-les-Moulineaux due to their geographical configuration as Flanders has to deal with a network of interconnected Cities, with their own data policies, and Issy-les-Moulineaux as part of a big urban agglomeration, with many decision levels, which is very dense and interconnected. Both complex situations have a direct impact on data and policy making.

Data privacy issues. This is a point that was met in Ghent and Flanders due to their scenarios and the sensors that were installed. It is a point that obliges, particularly with the new GDPR regulation, to be extremely careful to any potential breach of data privacy. In particular, the case of Ghent in which mobile data was used is key. Even if the data was anonymized, the detection of a person can represent a real issue, consequently important steps need to be taken with, next to anonymization, aggregation of data.

5.1.2 New uses and knowledge

The bottlenecks mentioned above or the simple participation in the project have allowed the pilots to move on, the most important new uses and knowledge are summarized below.

[34] https://thedataliteracyproject.org
[35] See "Data Literacy Survey Report"

More awareness of the value of data. The various pilots were already aware of the value of data in itself, having already advanced open data strategies in place and a vision related to data. At the same time, in particular, at decision makers level, this knowledge was just guessed. During the project, the meetings with policy makers have totally unlocked the potential of pilots that could start working 100% on such projects with a snowball effect. The various pilots that came out or could be deployed anyway in Issy, Mechelen and Pilsen in COVID time are good examples of how pilots took data as a real resource.

Use of dashboards. The pilots at the beginning of the project had quite interesting ideas about tools and solutions, but those were really theoretical and not often that realistic. As the project moved on, pilots had to deal with reality and they could finally find solutions. Every pilot has its own specifications, but a common point was the use of dashboards to have analyses of data. Those tools are useful to connect the policy makers with their operational departments and, in some cases, directly to citizens to make better accepted and/or understood some policies.

Co-creation projects. The PoliVisu's cities have started the project with scenarios that looked "self-standing", but the various bottlenecks met and PoliVisu itself pushed them to involve more and more other stakeholders. Finally, all pilots had constructed co-creation projects in which other private and public partners played a role. This was extremely evident in Ghent, Issy and Flanders, but absolutely true also in Pilsen where applications created by local startups, universities and associations were mixed with the City open data portal to improve the information to City administrators and citizens.

5.2 Recommendations for the future

As already reported in previous reports[36] and proposed in a summarizing video[37], the project could, through the various lessons learnt of its pilots make 6 useful recommendations for future projects.

Increasing Data Literacy. As reported above, Data Literacy is a real blocking point to deploy a good strategy. To this end, it is necessary to hire and to engage data analysts and scientists, at least as subcontractors. This is a key point to being successful.

Breaking Silos. Large and medium sized municipalities, in fact, are normally "siloed" structures, often not well connected between them. In this sense, even the data produced or stored by these silos are considered as a sort of exclusive property, which is not shared with other silos, even if that may bring benefit to the Municipality as a whole. Siloed organizational status is reproduced in data production and management. The best way to tackle this barrier is to create cross-cutting working tables with various services, starting from the ones that are considered more adapted and ready for a full digital transformation.

Showing data value to key internal players. The second relevant element of the political culture affecting the management of data is related to the role played by data in the Municipality procedures. Data is rarely, almost never, considered as a useful resource per se; it is rather seen as a functional component of bureaucratic

[36] D7.6 D7.6 Big & Open Data Use in Policymaking Manual (FINAL), chapter 5
[37] https://www.youtube.com/watch?v=eULv_XQDIeo

procedures and, as such, not considered as a relevant output of any process. This reduces the attention to data production and management and does not include any scenario of data re-use or utilization in other activities or processes. It is clear that failure in considering data as public good finds its origin in the (merely) bureaucratic approach to public service production and supply; one could even say that public services themselves are not considered or managed as common goods. To move through this barrier, it is needed to show the value of data, creating some first useful applications in a pilot mode, the positive reactions of citizens and external stakeholders will represent a real motivation for City teams.

Giving strong political support to digital transformation teams. The third element is strictly related to individual behaviors, being a project to implement data, a real change of paradigm that requests a strong effort in the short term. It is not obvious to have teams of the various departments to “hide” their non-effort to make the internal procedures improved through data. This psychological effect is actually related to the same reasons related to the behavior shift in mobility, while a person that for 20 years has used the car to go to work, even when not motivated enough, refuses to change, even if confronted with clear proofs that a switch would give him/her an advantage in the medium-long term. PoliVisu's Cities experiences showed how a strong political will is absolutely necessary to go through this resistance.

Building partnerships with the private sector. PoliVisu has noticed how the construction of private-public partnerships, also with some minor financial contributions of Cities and other public authorities, can drive the construction of efficient collaborations with good advantages for all parties. Actually, the project could stimulate Cities to look for private partners providing data (Issy) or tools (Pilsen) or both of them (Ghent) and to settle an on the ground collaboration. While this collaboration starts, the project has noticed how Cities start a quick innovation process, showing how the usual anti-innovative approach can change, and private companies show an unusual capacity to support them, also providing, in some cases, investment (Issy and Ghent).

Including data clauses on public procurements. Cities need to show a good capacity to learn from their past mistakes. In particular, the lack of inclusion of clauses in public procurement contracts is one of the biggest lessons learnt from Cities, making those clauses, from now on, fundamental in all public tenders. It is then absolutely necessary to include clauses on public procurements to access the data and, when necessary, to have also included a good format making it quickly usable. Cities should also consider whether, in addition to getting access to the data themselves, the contracts should require the supplier to make the data available as open data or to other private sector actors on a fair and equitable basis so that innovation and societal benefit can be maximized.

ANNEXES

ANNEX I. Detailed description of Pilots activities in Impact iteration

Ghent

Proximus collaboration

As stated before, the main focus of the Ghent pilot during the different iterations was the collaboration between Proximus and the city. In the last iteration, we started working with the raw data from Proximus (2nd data iteration) in order to make understandable visualization for the different involved stakeholders.

During July-August 2020, it became clear that there were still some minor problems with the delivered dataset, which could result in misinterpretations of the data itself. Based on market shares, the data had been extrapolated (e.g. if 100 mobile phones that conform to the pattern of a residential student were registered in a cell, and we know that the market share among students for Proximus is 25%, it was written down that approximately 400 residential students were in that area, at that time). For some groups (e.g. tourists), this extrapolation had been problematic. Data from some time slots was also missing, while at other time slots we saw an increase in visitors due to problems with masts. All of these issues were addressed by Proximus.

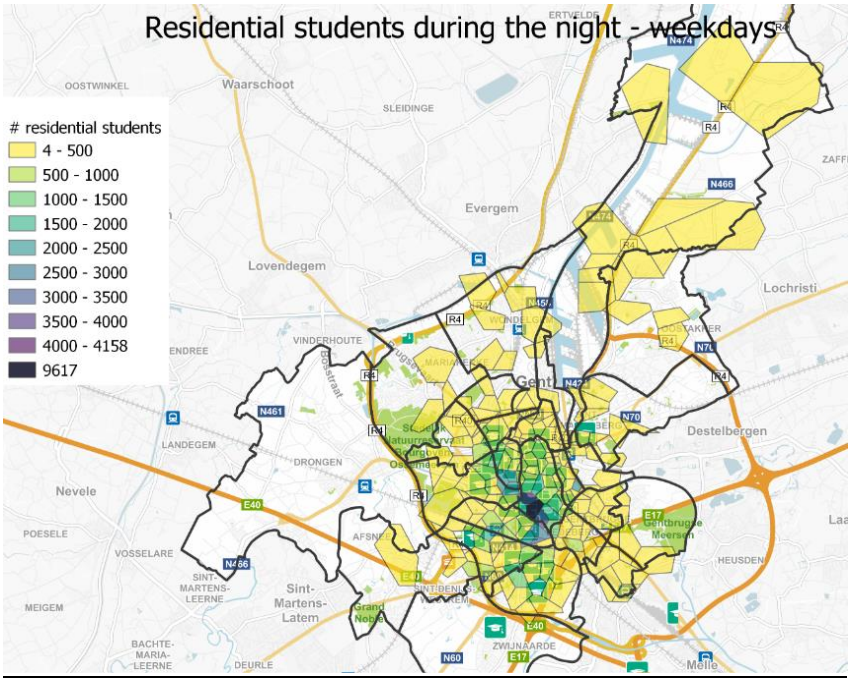


Figure 11 Locations of the residential students based on telecommunication data from Proximus.

At the beginning of september 2020, we received a new redefined dataset from Proximus that answers our original pilot question better and was suited for better visualization making. At the time of writing, Ghent is still working on the first visualizations and hopes to deliver the self-service tools mid-October.

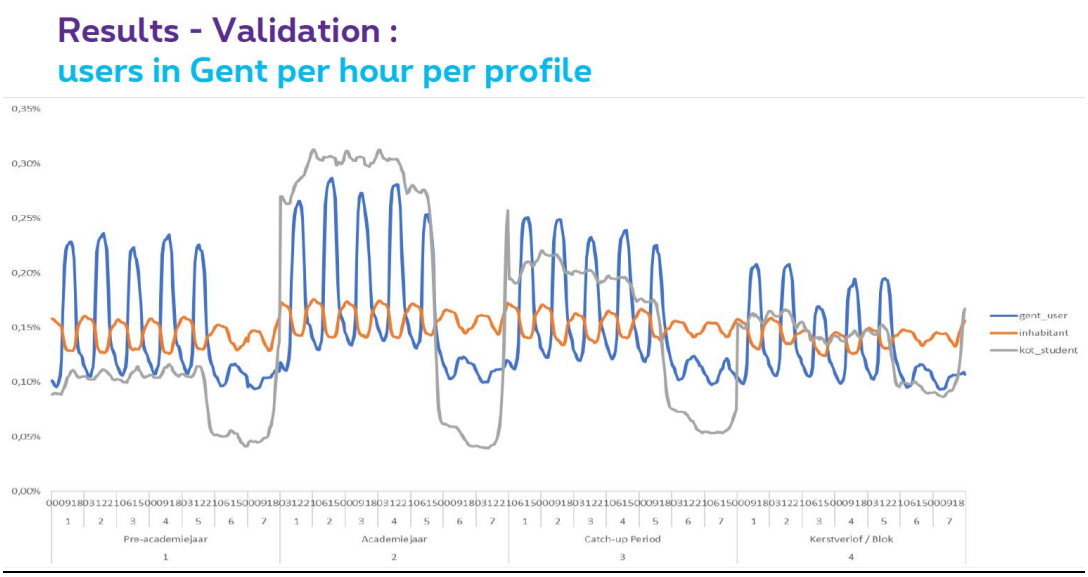


Figure 12 Variation in users in Ghent[38]

<u>Study on habitation</u>

During the last iteration, the data and information unit was also involved in the new 'study on habitation', carried out by the living and housing department.

The information and knowledge gathered by the data and information unit proved to be very useful in determining the scope of this study. The results of the first pilot iteration (*the combination of the existing data sources*) helped to better understand the data issue that currently exists. (*Cf. lack of complete data sources, lack of quality checks and so on.)*.

The experience of the PoliVisu project also resulted in ruling out different possible data sources that were suggested for this study. The use of social media data (cf. iteration 2) to locate students was therefore quickly thrown off the table. Also, the results of the mobile telecommunication data were taken into account when discussing the precise scope of this new study.

<u>Rise in data-awareness</u>

One of the focusses of the Ghent pilot was about raising the (big) data knowledge and experience within its own organization.

A meeting with the department of urban development was held to talk about and to discuss the level of (big) data awareness within the department. This fits in a series of meetings with other departments about the

[38] This graph shows the variation of users (visitors of Ghent in blue, inhabitants in orange and residential students in grey) during the day, averaged over every day of the week. Four weeks are shown, first a week before the academic year has started, a typical week during the academic year, a week during the period where there are some classes, but students are preparing for exams, and a week during the Christmas holiday period.

development of a more data mature organization. The PoliVisu project serves an example of how to obtain, investigate and start using an external big data source for policy goals.

By increasing the level of data maturity and awareness within the organization, future projects, such as PoliVisu once was, will quickly find their way into other departments.

Table 7 Evaluation activities during iteration 4 in Ghent

Date	Workshops/Activities	Participants	Externals	Feedbacks
20/05/2020	Internal evaluation & brainstorm of new Proximus data	5	0	0
26/05/2020	Follow-up meeting with Proximus - questions about the data & requests for last data iteration ('iteration 2.1')	6	3	0
9/07/2020	Meeting with department of urban development	10	0	0
July - August	Creation of first visualization tests with Proximus data	2	0	0
September - October	Adaption of visualizations with new dataset (iteration 2.1)	2	0	0
October	Meeting with communication department about dissemination internally	4	0	0

Evaluation scenario

In January 2020, before the COVID-19 outbreak, Ghent defined the following goals in tir evaluation scenario:

- *Obtain data concerning the housing location of students that is ready to be used for policy making.*
- *The data should be available through self-service tools which are easy to be used by the policy makers*
- *Define how representative the data is for the population. It is not possible to obtain data that indicates for every residential student where they live. Ghent explored different data sources but representativeness poses different challenges here:*

- *Wifi sniffing: is there a specific profile of people who leave their wifi on? Not every street/part of the city is covered;*
- *Social media data: specific profile of students who are present on social media/post/…; limits on data access (Facebook); limited number of users (Twitter)*
- *Mobile phone data: what is the market share of the telecom provider?*

- *Raise awareness within the public administration about the use of data for policy making.*
- *A direct consequence of having a data-driven policy-making procedure within the city is that more data-related questions will reach the office for data and information.*

The outbreak of the COVID-19 did not cause any major shifts from the originally planned goals. However, due to the pandemic, the Data and Information unit had to reorganize its planning since the unit was responsible for handling the COVID-19 numbers. This resulted in some minor delays at first but did not cause any big trouble for the defined goals at the end.

Table 8 Success criteria of Ghent evaluation scenario

KPI	Expected	Results
APPLICATION		
Acceptance of the model	Full	Y
Usability of the data	Full	Y
Number of expert lens interviews	5	2 (webinars)
DATA		
Number of possible datasets explored	7	7
USE		
Number of stakeholders collaborating	23	23
Number of policies explored	5	1

Number of policy decisions	2	/
Number of cities contacted	43	10
TRAINING		
Number of training events	2	2
Number of people trained	47	50
Satisfaction of trainers	100%	Y
Satisfaction of trainees	100%	Y
Increased understanding of trainees	100%	Y

Pilsen

During the 4th iteration, meetings with users of the tools have continued (e.g meetings with municipal and state police and other security stakeholders regarding the Safe Roads Map) and, based on feedback, tools and visualizations (especially the Traffic Modeler and the Pilsen Safer Roads Map) have been further developed. The Map of Traffic released to the production in the previous pilot iteration has been maintained and continued to be used by the city experts.

This represents a shift in this iteration, as explained in the following paragraph with activities.

Table 9 Evaluation activities during iteration 4

Date	Workshops/Activities	Participants	Externals	Feedbacks
23.3.2020 23.4.2020	**Impact of coronavirus on traffic** article: Loops Analysis Covid19 Map of COVID-19 in Czechia	300	300	5
16.4.2020 16.9.2020	Virtual meeting Traffic Modeler	13	-	10
28.4.2020	New Map Portal of the city of Pilsen	-	-	-
30.6.2020	Meeting Police and other road security stakeholders - Pilsen Safe Roads Map	7	5	10
26.6.2020	Testing Traffic Modeller	5	-	78
8.9.2020	Webinar Traffic Modeller	25	25	-
In September	Pilsen Safe Roads Map	-	-	-
May + June	Pilsen Traffic Map	11	4	-

<u>Creating new datasets</u>

During the 4th iteration, an object map of the surface situation in the entire city was created as a base layer. This was used to create the running of the profile section (calculated from detectors) so that they best capture the approach direction to the intersection. These lines of profile sections were used in the Pilsen Traffic Map (Traffic Modeller App).

Figure 13 Running of the profile sections (cyan color line)

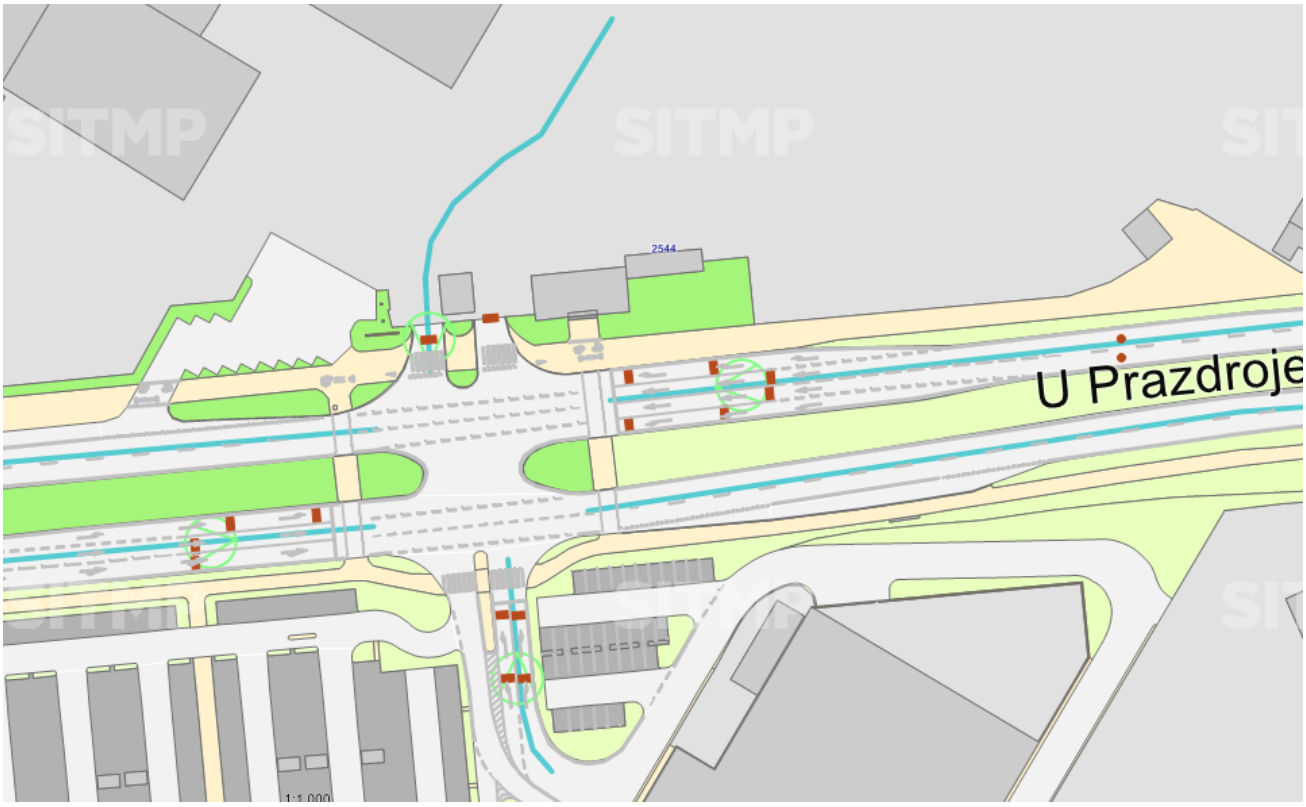


Figure 14 Detail of intersection with loop detectors (brown color rectangle)

<u>The impact of coronavirus on traffic.</u>

EDIP prepared an interesting outcome regarding the decrease in traffic intensity during school holidays and due to restriction because of coronavirus.

The data were obtained using the [Map of Traffic in Pilsen](). A busy intersection in Pilsen was selected, sady Pětatřicátníků x Palackého náměstí (I/27 x 8/20-I/26), also known as “By the Main Post Office”.

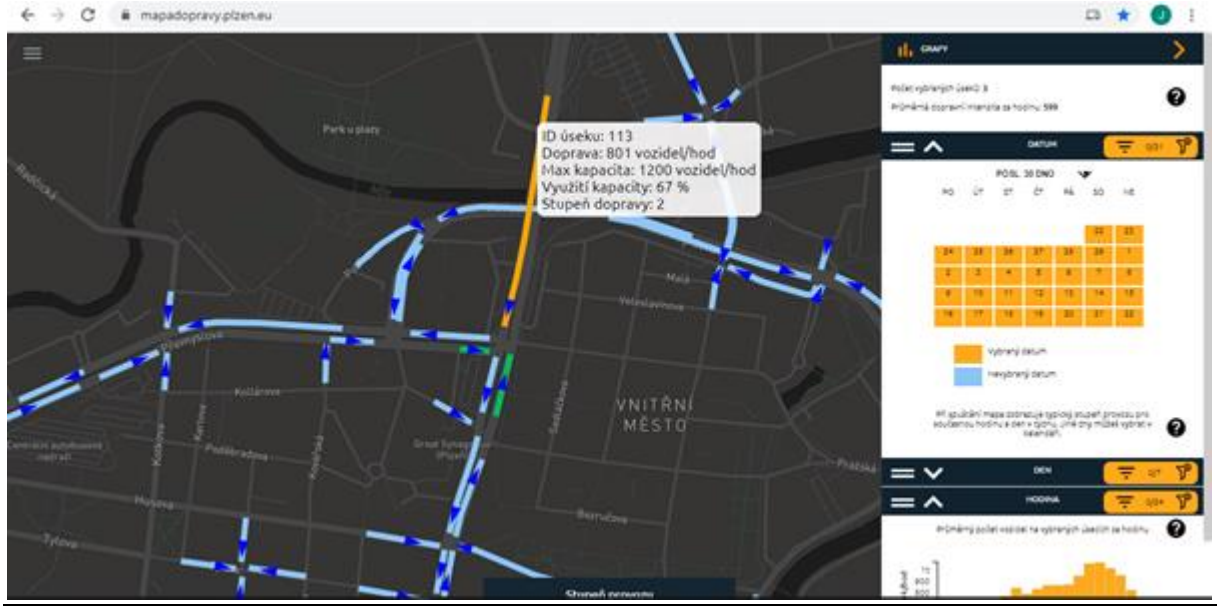


Figure 15 Application Traffic map in Pilsen

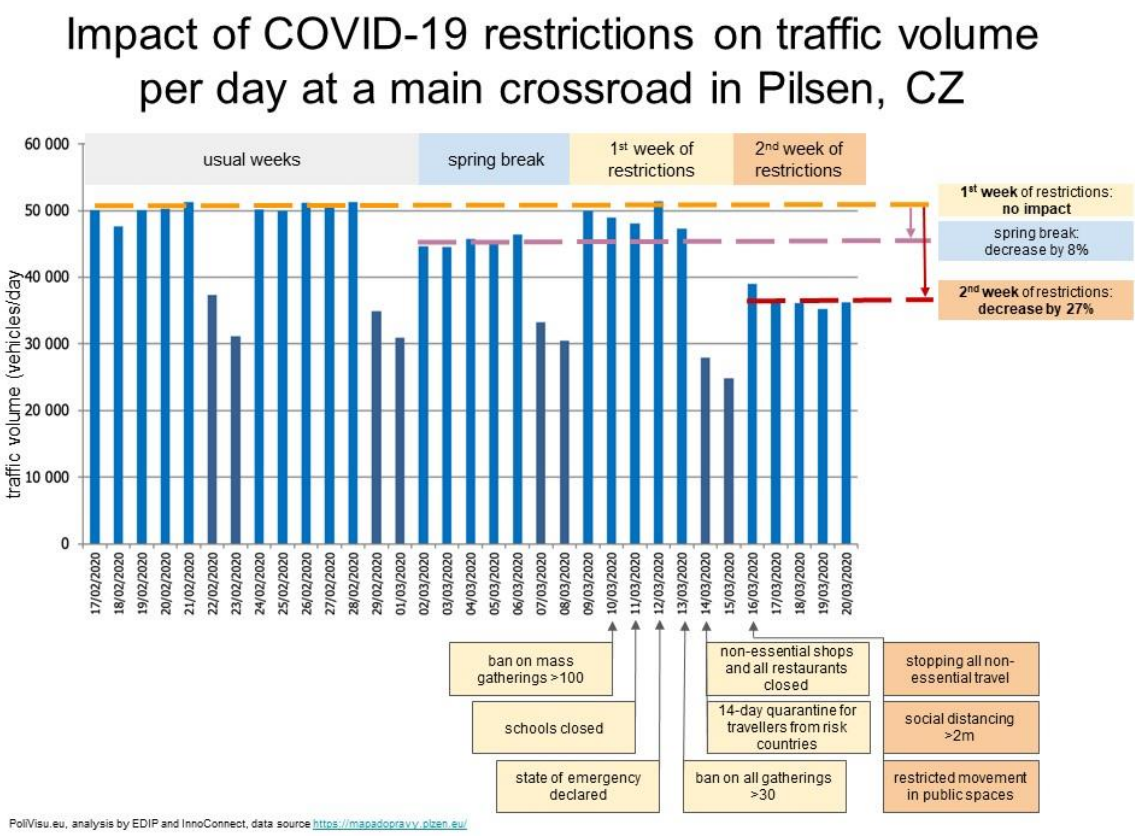


Figure 16 Daily volume traffic during the period

From the figure and data it is obvious:

- About 50,000 vehicles pass through the intersection every day (working day).
- Spring breaks meant a decrease in traffic volume of about 8%.
- The first week of restrictions (from Tuesday "ban on gathering over 100 people", from Wednesday's "end of full-time schooling", from Thursday "emergency state", from Saturday "closing of shops and other gathering restrictions") did not have a significant effect on traffic volume , the decline is noticeable from Friday.
- The second week of restriction (further restriction of movement to necessary journeys) already means a significant decrease in traffic volume, on a normal working day by up to 27%.

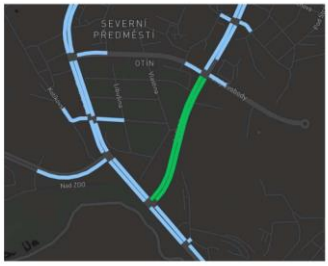
The results were published in a special issue of the journal Dopravní inženýrství and on the web page[39] of city company SVSmP. The Traffic Map in Pilsen application is used by city officials to monitor traffic.

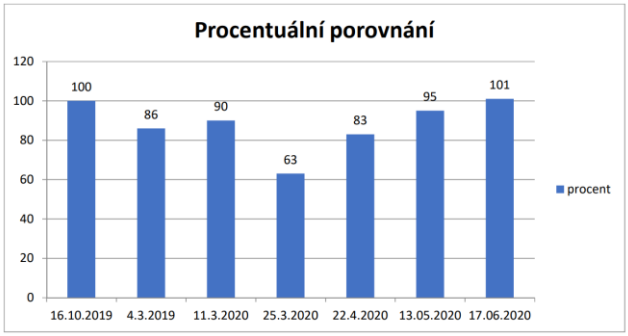
[39] All report available on http://www.svsmp.cz/download.aspx?dontparse=true&FileID=56611 (in czech)

Training and usage of the Map of Traffic in Pilsen

The Map of Traffic in Pilsen that was delivered to the Pilsen City at the end of 2019 has continued to be used by the city traffic experts for the purposes of reports, statistics, and traffic analysis.

For instance, SVS, the department of the Pilsen city responsible for the traffic management, used the Map of Traffic to deliver an analytical report on the impact of COVID-19 related restrictions (introduced in March and April by the government) on the traffic intensity in the city. The full report in Czech is available on the city website.[40]





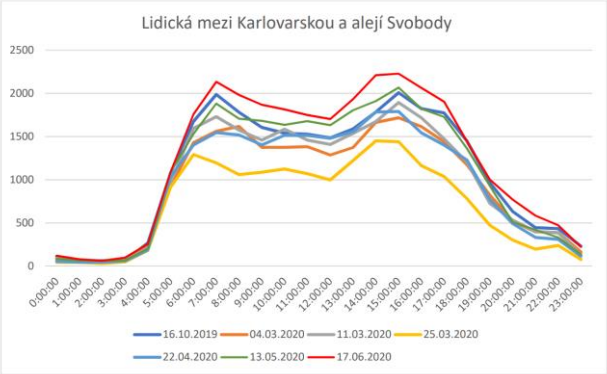


Figure 17 Charts from the analysis of the COVID-19 related drop in traffic

Virtual Meetings on Traffic Modeller

A Virtual Meeting on **Traffic Modeller** with technical partners took place in **April**, where the current development version was shown and the feedback was provided. The works were divided into summer and autumn parts. We also talked about expanding the API, so it can provide data directly, not just via downloading

[40] http://www.svsmp.cz/dopravni-pruzkumy/intenzity-dopravy-behem-krizovych-opatreni-ii.aspx

from the OpenData portal. We started working on linking historical sections with the traffic model. We discussed about real data from sensors, and redesigning the graphical environment (GUI) of TM.

Intensive testing of the application took place in **June**, and at the end of June, the application was released to the public. We update the closures to Traffic Modeller regularly once a week.

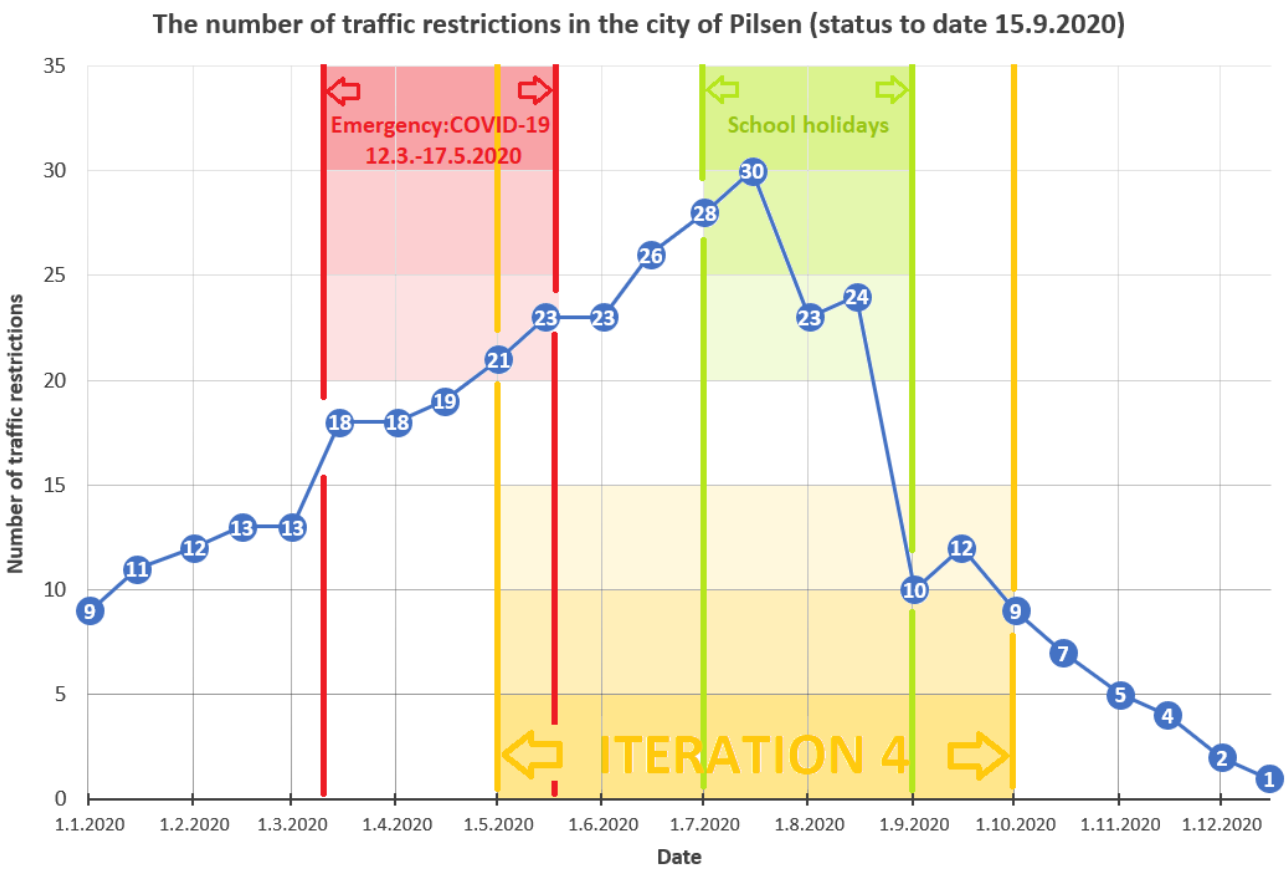


Figure 18 The number off traffic restrictions during one year 2020

During the 4th iteration, we verified in the TM application the increase of traffic restrictions in Pilsen during the school holidays (from 1st July to 31st August). Most traffic restrictions are planned for this period every year, because the traffic intensity in the city is lower. School holidays therefore offer the most opportunities for better planning and coordination of joint construction work by various companies - investors (reconstruction of utilities, roads, etc.). The state of emergency due to COVID-19 (from 12th March to 17th May) did not affect the number of closures, although the society was much paralyzed and the economy almost stopped. The construction works continued without restrictions during this period.

Pilsen Traffic Safety Map: testing & user feedback, Police Data integration

We have further progressed with the development and testing of the **Pilsen Traffic Safety Map**. The average speed control offenses were added in the app. It was presented to the Deputy Mayor responsible for security,

top executives of State and Municipal Police in Pilsen and other city stakeholders on **30 June**. The city and police expressed a clear interest in the visualization and provided suggestions for further improvements. City and Police will use it for internal purposes (only the traffic accidents part can be released to the public). The Pilsen Traffic Map and a demonstration of the Map of Traffic Accidents in Flanders were also presented at this meeting.

The Pilsen Traffic Safety Map has been finalized over the summer and during the final months of the project according to the feedback captured during the June meeting.

- We set up an automated daily update of the data from average speed control zones.
- The feedback from the police officers included the requirement to incorporate layers from the GIS system (e.g. police districts, service buildings, parking zones and line layer showing a reserved residential space in Pilsen). The parking zones and residential parking were added to the app.
- The final release of the new version of the application is scheduled for October 2020 and shall include the authentication solution that will restrict access only to city and police users.

The application will be introduced to a wider group of city and police users in October. We assume that the application will appeal to the mayors of the city districts where most citizens reside. In these city districts, the application can visualize problem areas to be targeted by policy makers.

The city security stakeholders and policy currently do not want to release the application to the general public due to sensitive information contained in the driving offenses data, however, this might change over time or just a part of the data can be released to the public.

New Map Portal of the city of Pilsen

We worked very hard to redesign **the city's map portal website**. The new map portal is launched at the link (https://mapy.plzen.eu/). There are articles about the PoliVisu project and available map applications to improve traffic. This means the Traffic Modeler and WebGLayer platforms. Unfortunately, these webpages are only in the Czech language.

Webinars

Due to the situation regarding the coronavirus pandemic, it was not possible during the fourth iteration to hold larger meetings with users of the developed tools. Live webinars organized by the PoliVisu consortium were used to present WebGLayer visualization of the Traffic Map in Pilsen and a new version of the Traffic Modeller application.

The first **live webinar** about Pilsen's case studies: **Dynamic visualizations for Analysing Road Accidents and Traffic Conditions: The Case of WebGLayer** was held on **June 23**. This webinar presented the WebGLayer tool as an enabler of dynamic visualizations that make Spatio-temporal patterns, relationships and trends in the underlying data more apparent. Using case studies from Pilsen and Flanders was shown, how policy makers can use WebGLayer to address local problems such as traffic congestion and road accidents.

The webinar record is available at: https://youtu.be/wXrQ6YMmgXo

The second **live webinar**: "**Make your city less congested with Traffic Modeller**" was held on **September 8**. Registered listeners learned how **Traffic Modeller** uses different schemas to calculate traffic volumes in near real-time, and how calculations can be modified according to different user-defined scenarios e.g. adding a new lane or closing an existing one. Additionally, PoliVisu experts explained what inputs are needed to run the tool, and what benefits one can expect to get from its use. The latter was demonstrated using real-life case studies from three cities: Pilsen, Františkovy Lázně and Mechelen.
The webinar record is available at: https://youtu.be/zNftuAQGDYk

Traffic Modeller - new versions and testing.

During the fourth iteration, **two production versions of Traffic Modeller for Pilsen were released**. Before publishing the public and non-public part of Traffic Modeller, both products were tested and our comments were solved together with our technical partners (P4A).

During the development of the application in the fourth iteration, the **model recalculation by editing the road works was accelerated** and the **comparison of traffic models has been improved**. The application is still easier to use by **improving the GUI**.In addition to the visualization of the state of traffic in the past (measured data from sensors) and in the future (by modeling), the possibility of displaying the **visualization of traffic based on current data from traffic detectors has been added**.

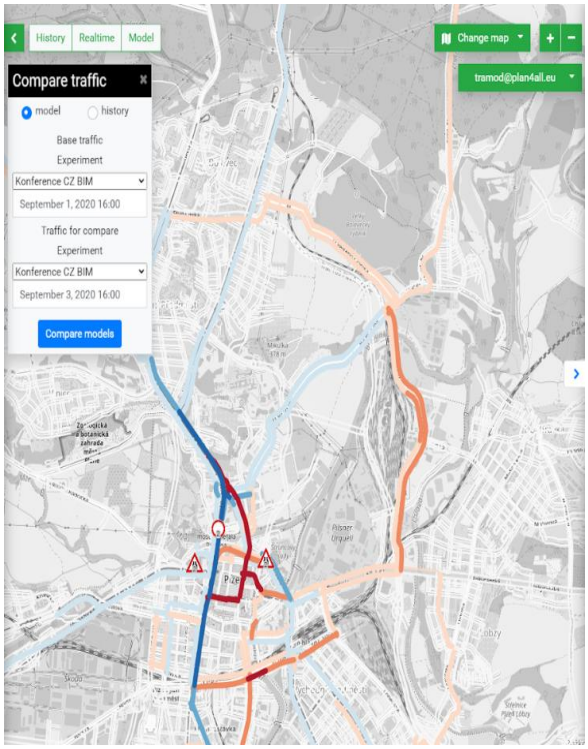


Figure 19 Differences in traffic volume between two different moments in time in Pilsen

The figure portrays the differences in traffic volume between two different moments in time. The color of the line (road segment) will represent an increase (orange color range) or a decrease (blue color range) in traffic volume between two selected traffic situations. The visualization can be applied to two different traffic models or two different measurements of sensor data. This particular example depicts the difference between two traffic situations: the first situation is from 1.9. 2020 16:00 CET, where the two narrowings take place and the second traffic situation from 3.9. 2020 16:00 CET where a bridge closure is added to the model. There can be seen the streets (the vivid red color), where a significant traffic volume growth can be expected. A city has two options there. Decide to postpone the bridge closure (if possible) or to plan some de routing to spread the traffic from the city center to a wider area.

Help for dissemination MOOC

From August we disseminated information about **MOOC** the online course through some channels. (on the Citi of Pilsen on Twitter, FCB and classic websites).

Traffic Modeller

The City of Pilsen has developed the Traffic Modeller application (TraMod) for inserting traffic closures and restrictions into the street network of the city, for traffic modeling and for visualizing the historic and on-line state of traffic intensity based on data from traffic detectors.

In the original scenario in D7.5 KPIs have been defined and here we present their evaluation.

The functionality of TraMod has been met. The application allows collecting the road closures, modeling and comparing different states/models, publishing predicted traffic situations etc.

The number of users using TraMod to insert traffic measures has not been expanded yet. For the time being, their role is performed by the SITMP with a view to handing over this agenda to the responsible traffic departments of the city. The traffic department of the City of Pilsen, the infrastructure managers and utility providers upload their traffic restrictions to JSDI, which is the data source to TraMod. Traffic restrictions in TraMod are updated once a week by SITMP.

User experiments and experiment sharing were only simulated as part of TraMod testing. So far, these results have not been reflected in practice and traffic experts do not use TraMod yet for actual work and verification of proposals for new roads or verification of impacts on traffic intensity after the implemented SUMP measures. There is a need to train these people more and give them more time to understand the benefits of the application and get used to the new application.

Figures showing increasing access to the public part of TraMod demonstrate its growing popularity. This was also evidenced by the interest in the webinar on TraMod.

Evaluation of the benefits of using TraMod (such as a decreasing number of closures by 10%, the duration of traffic congestion) will be possible only after its full deployment. Then we will be able to compare the numbers and lengths of traffic restrictions before and after using the developed application.

Table 10 Success criteria of Pilsen evaluation scenario - relates only to the Traffic Modeller

KPI	Expected	Met
APPLICATION		
Acceptance of model/workflow Implementing Superdio into TM (change from XLS list of closures to the implemented module in Traffic modeller)	Yes, Full	Y
Acceptance of Traffic model behavior	80%	80%
Nr. of stakeholders (source of closures, detector updates)	10	Y
Nr. of feedbacks (from app link, training, workshops, interviews, ...)	10 per year	78 in 4th iteration
Nr. of surveys/returned feedback	1 /10%	2 webinars
DATA		
Nr. of records from detectors (1 hour traffic profiles)	approx. 2 750 000 per year	Y
Nr. of closures inserted	all major	85
Nr. of closures modelled	20 - 30 per year	60
Nr. of user experiments	20 per year	Y
Nr. of modelled / verified SUMP measures	5 per year	Y
Nr. of updates of Traffic model	2 per year	Y
Nr. of published outputs/variants	5 per year	Y

Nr. of datasets in DCAT	3	Y
USE		
Nr. of city users	6	6 (Y)
Nr. of public uses (Google analytics) - presented results	500 per month[41]	750 (Y)
Nr. of city uses (Google analytics) - inserting closures, modelling	30 per month	40 (Y)
TRAINING		
Nr. of trainers	2	2 (Y)
Nr. of trained users	5	6
Nr. of training events	2	2 (Y)

[41] The two rows of the table refer to "Traffic Modeller":

- public part of Traffic Modeller and
- non-public - experimenting part of app.

Issy-les-Moulineaux

My Anatol and Issy: data to evaluate bike measures in COVID time

Issy has been on a slightly new scenario to make possible to test a full policy making cycle. To this end, Issy has been working in a small group that was the result of the work done in the previous iterations, while the work was based on 3 different groups.

This group was composed by Issy Média, as a leader, MyAnatol, as a technical and data provider, and the City of Issy-les-Moulineaux (departments of urbanism and Smart City), as the final user.

In parallel, some discussions took place also with Be Mobile, to understand whether future collaborations may happen.

Clearly, due to COVID, the meetings and activities took place online.

Table 11 Evaluation activities during iteration 4

Date	Workshops/Activities	Participants	Externals	Feedbacks
25/02/2020	Meeting MyAnatol: point on ongoing Street Marketing Campaign	4	1	0
09/04/2020	Meeting MyAnatol: definition of new pilot	4	1	0
06/05/2020	Meeting MyAnatol: discussion about traffic data	4	1	0
16/06/2020	Meeting MyAnatol: definition of new pilot	4	1	0
25/06/2020	Meeting MyAnatol: definition of dashboard	4	1	0
07/07/2020	Meeting dashboard: demonstration and feedback	6	4	4
18/08/2020	Meeting MyAnatol: definition of dashboard	4	1	0

31/08/2020	Issy Média: definition of communication strategy with MyAnatol "datastory" and data training	7	0	7
14/09/2020	Meeting with City of Issy: results and training	5	3	3
All period	"Datastory"	1033	1033	0

This work allowed to:

- Create a PoliVisu story on our open data portal: https://data.issy.com/pages/polivisu/
- Make a dashboard about traffic and data: https://data.issy.com/pages/myanatol_tbd/
- Open a dataset on bike use and one on traffic
- Write a datastory with MyAnatol to share this success story

Due to COVID, the evaluation scenario created in early 2020 couldn't be applied, also due to the shift of the city scenario.

The original plan was:

"The scenario was based on the pilot and the MyAnatol pilot, mainly based on some KPIs were defined to evaluate this experience:

- *congestion reduced by 2% (reduction of the time lost in car on a 30 minutes ride);*
- *a number of users of the application of, minimum, 500 (downloads);*
- *a number of users playing the game (using the app at least 3 times) of, at least, 300;*
- *a number of users accepting the suggestion of the deviation of, at least, 150.*

Next to those quantitative numbers, followed through a dedicated dashboard put in place, it is defined a more qualitative one, based on the feedback that will be provided by the civil servants that are involved in communication and public services management (including smart city department).

Furthermore, some KPIs have been defined to evaluate also the positive impact of that pilot in improving the data literacy and readiness of the City:

- *10 civil servants involved in the process of the pilot;*
- *5 civil servants trained on smart visualizations and open data;*

- *10 civil servants interviewed."*[42]

Table 12. Success criteria of Issy-les-Moulineaux evaluation scenario

KPI	Expected	Met
APPLICATIONS		
Usefulness of dashboard	10 users	41 (Y)
Usability of dashboard (interviews)	80%	80%[43]
POLICY MAKING		
Acceptance of policy making model	Full	Y
Acceptance to improve behavior	+1%	Y
Increased use of bikes	+10%	Y
TRAINING		
Nr. of trainers	2	2 (Y)
Nr. of trained users	10	10 (Y)
Nr. of training events	2	2 (Y)

If the first set of KPIs couldn't be matched (although more than 300 persons downloaded the application), as the lockdown blocked totally the experimentation and it was complicated, if not impossible, to resume the street marketing campaign due to social distancing, but the second range could be met. Particularly, it was possible to train some local people and to interview them, to understand the acceptability and usefulness of the dashboard. The table above reports the results and the table below the KPIs that couldn't apply.

[42] As reported in "D7.5 Recommendations for future deployments 3"

[43] The dashboard was considered useful, although it kept been considered "too technical", which according to the users has a negative impact on use. Percentage has been simply a transformation in numbers of qualitative assumptions. Users stated clearly that the dashboard would be useful with some improvements.

Table 13 Success criteria of Issy-les-Moulineaux evaluation scenario that couldn't be applied

KPI	Expected
APPLICATIONS	
Acceptance to improve behaviour	+1%
Usefulness of MyAnatol (sessions)	10 000
Usability of MyAnatol (users accepting deviations)	150
POLICY MAKING	
Acceptance to improve behavior	+1%
Reduction of congestion in selected segments (peak hours)	-2%
USE	
Nr. of stakeholders downloading MyAnatol	500
Nr. of stakeholders using the application	300
Nr. of stakeholders accepting the deviation	150

Flanders

Below you can find a brief overview of the specific activities for each of the four pilots. More generic presentations are left out to focus and target on pilot specific actions.

Table 14 Evaluation activities during iteration 4 - Flanders Region

Date	Workshops/Activities	Participants	Externals	Feedbacks
9/3/2020	Flemish traffic safety congress	400+	400+	-

25/3/2020	Accident data improvement session Federal Police/Flemish government for accident map	6	3	-
6/4/2020	Meeting Flemish house for traffic safety related to accident map	6	3	-
27/4/2020	Meeting Flemish house for traffic safety related to accident map (2)	6	3	-
25/6/2020	Meeting Federal Police related to accident map	5	2	-
7/10/2020	Final demo and alignment with house for traffic safety related to accident map (3)	-	-	-
30/1/2020	Roll-out Telraam schoolstreet devices Mechelen	25+	24+	-
3/2/2020	Schoolstreet dashboard review and design 1	10+	8+	-
17/2/2020	Schoolstreet dashboard review and design 2	8+	6+	-
6/3/2020	Schoolstreet dashboard review and design 3	6+	4+	-
20/3/2020	Schoolstreet dashboard review and design 4	7+	5+	-
3/4/2020	Schoolstreet dashboard review and design 5	5+	3+	-
4/5/2020	Schoolstreet dashboard review and design 6	6+	4+	-

18/5/2020	Schoolstreet dashboard review and design 7	5+	3+	-
24/6/2020	Schoolstreet presentation education department	25+	23+	-
16/9/2020	Meeting “paraat voor de schoolstraat” project	8+	6+	-
14/02/2020	Innovation Lab: Presentation results of Voorkempen data analysis	100+	4	
2/7/2020	Workshop average speed control zone impact for police zones	9	4	-
22/9/2020	Workshop 2 & Demonstration average speed control zone impact for police zones	5	4	-
29/4/2020	First brainstorm on using floating car data for the analysis for analysing regional commuting behavior	3	1	-
26/5/2020	Brainstorm with TomTom about applicability of tools for analysing regional commuting behavior	6	4	-
9/7/2020	Discuss first analysis results for analysing regional commuting behavior	6	2	-

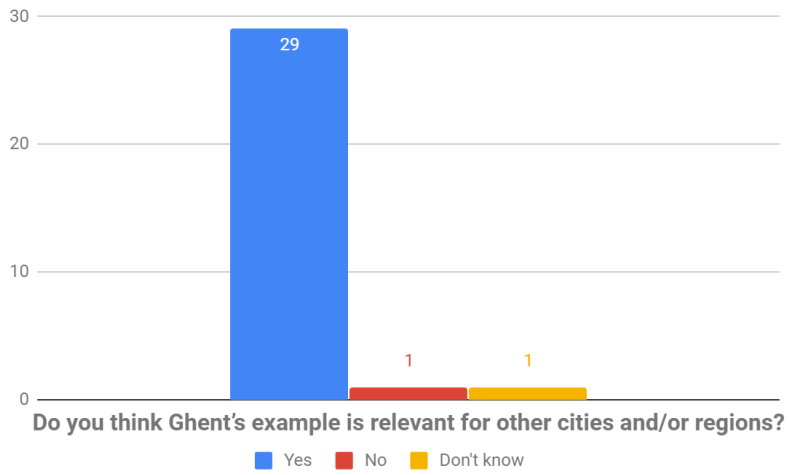
Annex II. Training live surveys results

Webinar 1. "How to overcome data challenges in transport policy making? Lessons from the PoliVisu pilots"

- Duration: 78 minutes
- Registrations: 74
- Attendees: 38
- Attendance rate: 51%
- Q&A interactions: 2
    - *"What were the resultant policies that were created/recommended from these projects?"*
    - *"On the topic of scalability and progress beyond the pilot phase, I hope this publication will be useful to the participants. There are two key points. One was to design the pilot to address operational pain-points by focusing on 'any-to-any' data sharing. That avoids the problem of silo solutions. The second point is the use of an open standard (oneM2M.org) for the platform to handle data. That means cities are less worried about locking into a single technology or single vendor. The pilot in this study has expanded and now operates at national scale in the UK.[44]"*

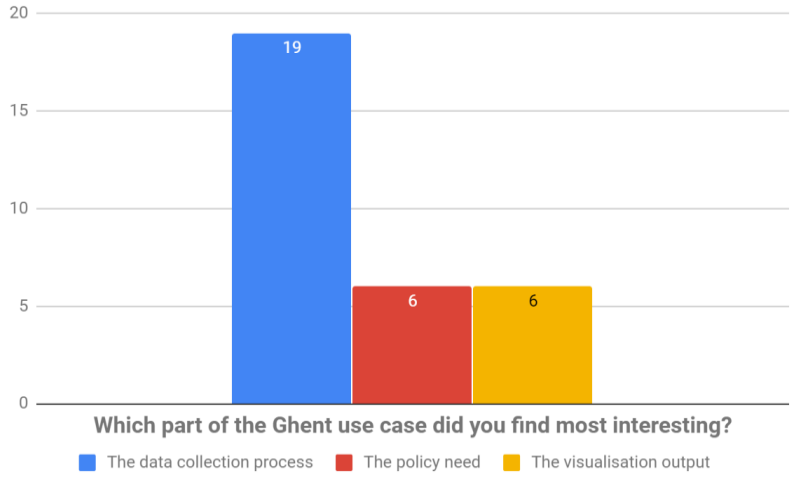
Poll results

Q1. Do you think Ghent's example is relevant for other cities and/or regions? (n=31)

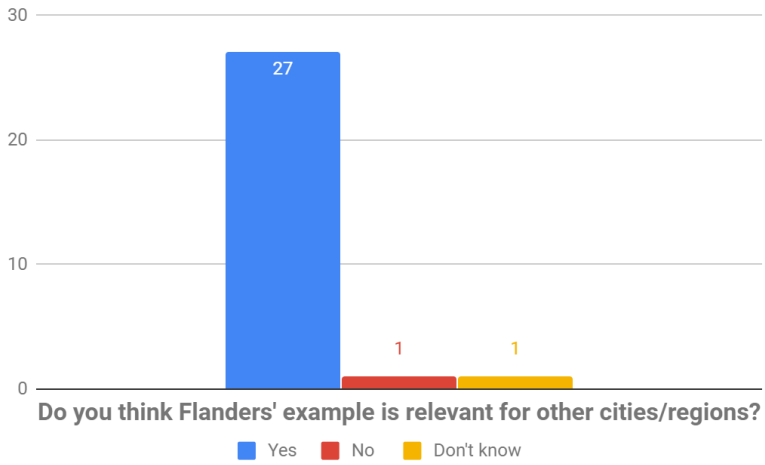


Q2. Which part of the Ghent use case did you find most interesting? (n=31)

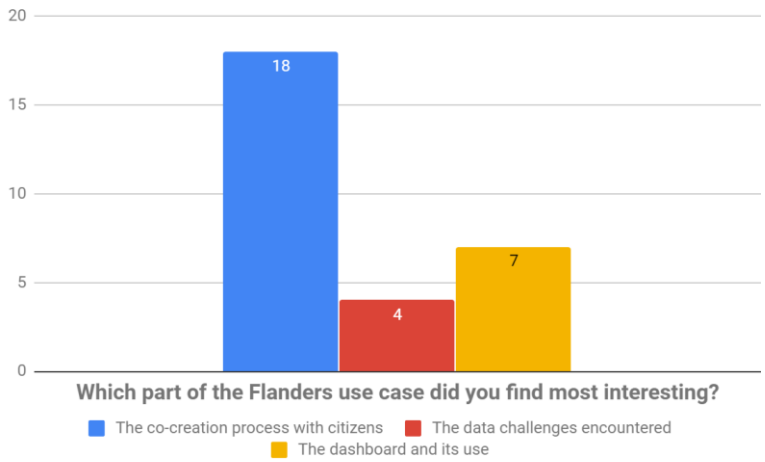
44 https://www.iiconsortium.org/pdf/June_2017_JoI_Intelligent_Transport_Solutions_for_Smart_Cities_and_Regions.pdf



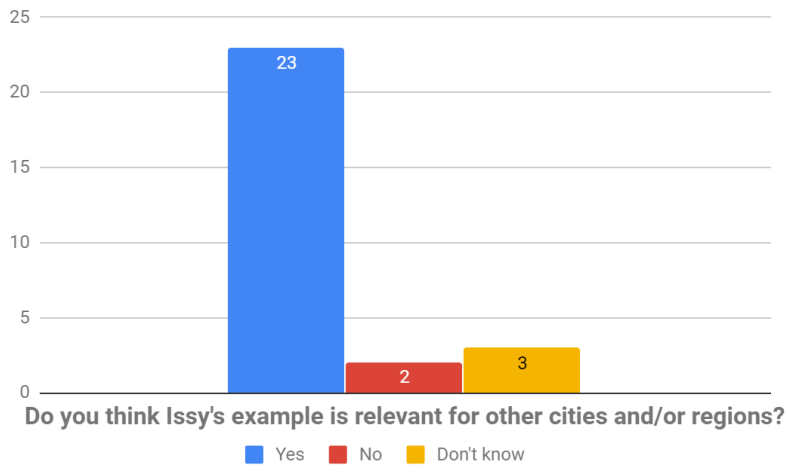
Q3. Do you think Flanders' example is relevant for other cities/regions? (n=29)



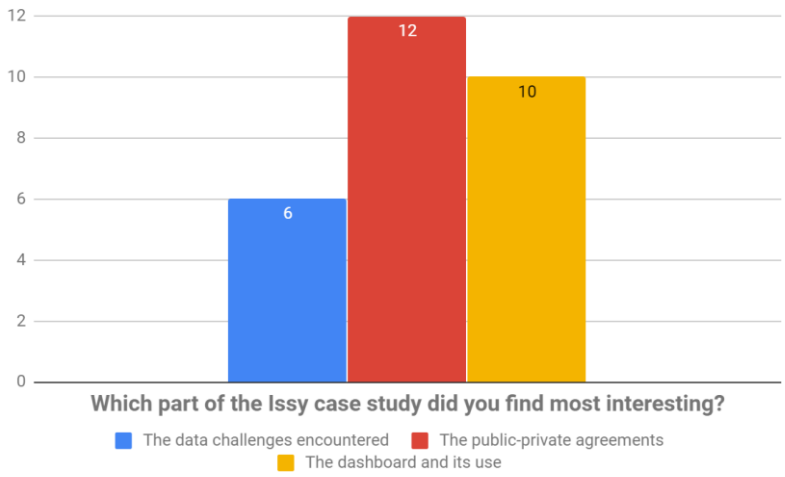
Q4. Which part of the Flanders use case did you find most interesting? (n=29)



Q5. Do you think Issy's example is relevant for other cities and/or regions? (n=28)



Q6. Which part of the Issy case study did you find most interesting? (n=28)



<u>Post-webinar survey</u>

Q1. Did you experience any technical difficulties either before or during the webinar?

- No difficulties (n=6)

Q2. How did you hear about the webinar?

- Twitter: 1
- Newsletter: 1
- Word of mouth: 4

Q3. What motivated you to join the webinar?

- Learn about the different data challenges in transport policy making: 3
- Lear how to overcome these challenges using the international best practice: 2
- Find out more about the PoliVisu project: 3

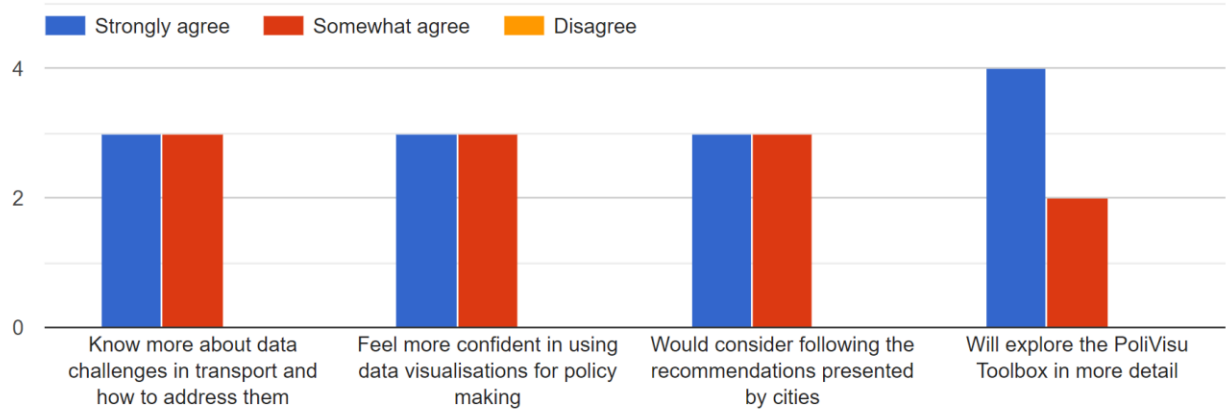
Q4. What did you like most about the webinar?

- *"That I could join it direct from my office."*
- *"The processes that were required to acquire the right data."*
- *"Everything. I really think this is a very good project and the practices were top!"*
- *"Crisp and clear."*
- *"The dashboards."*
- *"It provided me useful insights of projects that concern data driven solutions."*

Q5. What do you think could be improved?

- *"Make sure no one else can 'play with the mouse' and take over the screen if not wanted."*
- *"I think it would have deserved more information about the pilots - what was their value for the users and for the city administration and what reusable tools you are delivering."*
- *"Maybe an open discussion would be interesting."*

Q6. Please tell us whether, after attending the webinar, you

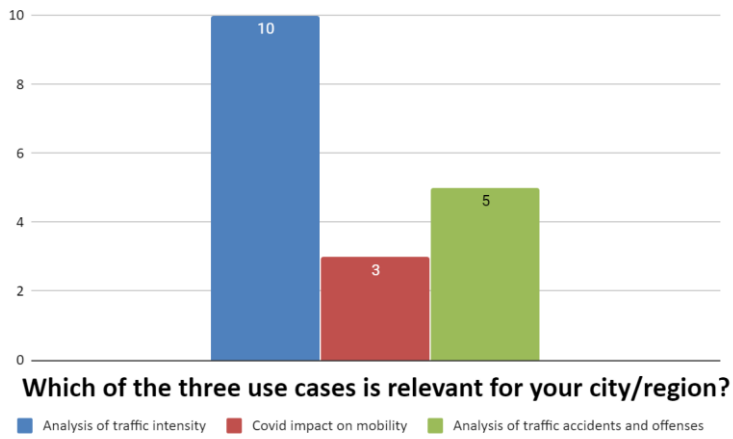


Webinar 2. "Dynamic visualizations for Analysing Road Accidents and Traffic Conditions: The Case of WebGLayer"

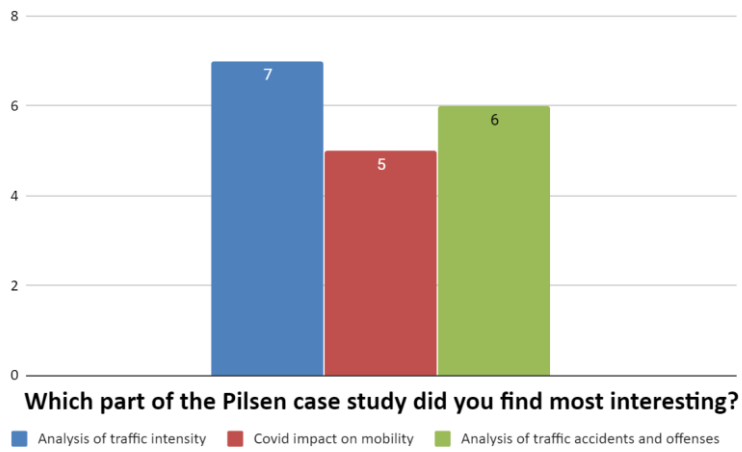
- Duration: 70 minutes
- Registrations: 61
- Attendees: 25
- Attendance rate: 41%
- Q&A interactions: 3
    - *"Is it a product (WebGLayer)? Or a specific project for Pilsen?"*
    - *"Assuming that another city wishes to adopt Polivisu is it an industrialised, replicable and documented solution?"*
    - *"Have you analysed the causes of accidents? How is it at fault?"*

<u>Poll results</u>

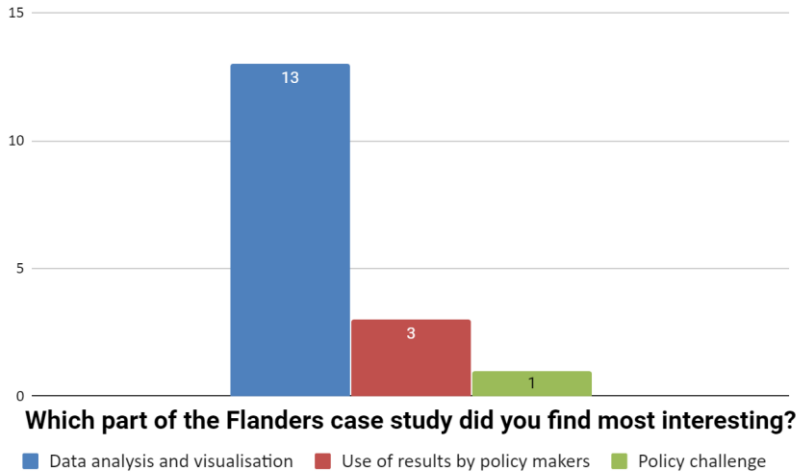
Q1. Which of the three Pilsen use cases is relevant for your city/region? (n=18)



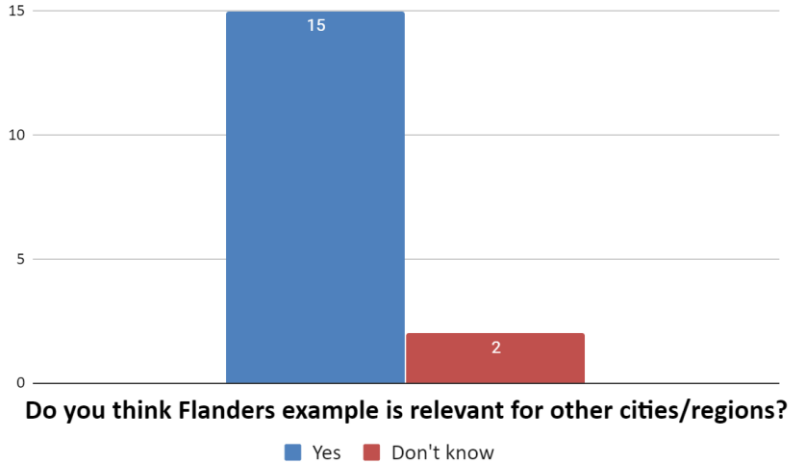
Q2. Which part of the Pilsen case study did you find most interesting? (n=18)



Q3. Which part of the Flanders case study did you find most interesting? (n=17)



Q4. Do you think Flanders example is relevant for other cities/regions? (n=17)



<u>Post-webinar survey</u>

Q1. Did you experience any technical difficulties either before or after the webinar?

- No difficulties (n=9)

Q2. How did you hear about the webinar?

- Twitter: 2
- LinkedIn: 1
- Newsletter: 1
- Word of mouth: 4

- Email invitation: 1

Q3. What motivated you to join the webinar?

- Learn about the benefits of dynamic visualizations: 3
- Find out how cities are using dynamic visualizations to achieve policy goals: 3
- Learn about the WebGLayer tool: 2
- Find out more about the PoliVisu project: 2

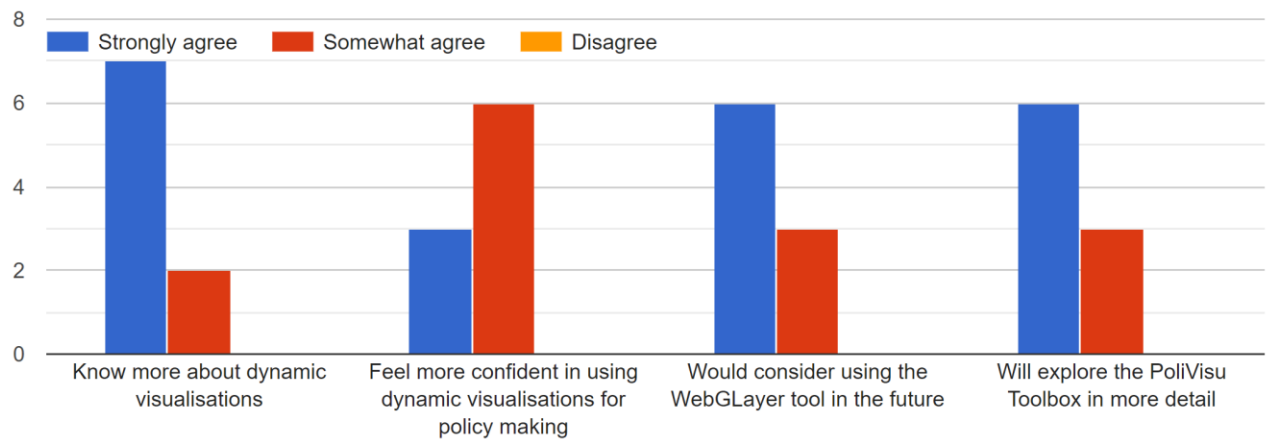
Q4. What did you like most about the webinar?

- *"I was interested in the line in the temperature map and live demos."*
- *"The Visualization and the interpretations of Data."*
- *"Concrete projects."*
- *"Use cases."*
- *"Good presentations."*
- *"The interactive website application in both cities, which is open for public use."*
- *"Seeing the visualization tool in action."*
- *"Live demonstrations."*

Q5. What do you think could be improved?

- *"Brief the case study background."*
- *"Sending out a copy of presentation and links afterwards."*
- *"Bit more on benefits for policy makers e.g. cost savings."*

Q6. Please tell us whether, after attending the webinar, you

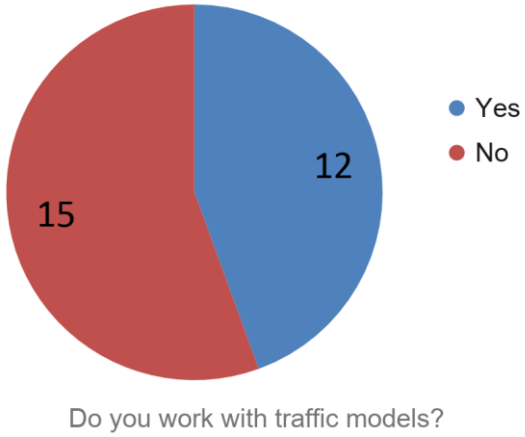


Webinar 3. "Measure | Visualise | Reroute : Make your city less congested with Traffic Modeller"

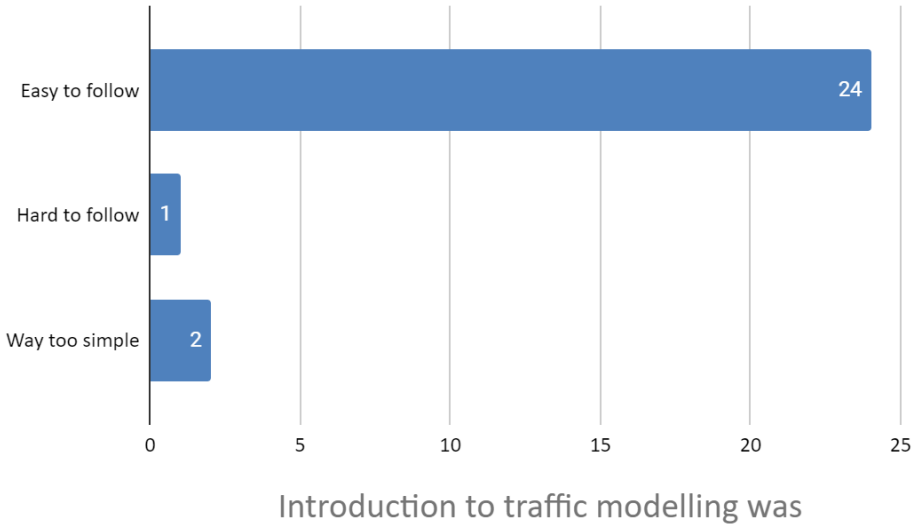
- Duration: 81 minus
- Registrations: 67
- Attendees: 49
- Attendance rate: 73%
- Q&A interactions: 3
    - *"In one presentation the application of "air pollution" was mentioned, could you elaborate a bit more on that?"*
    - *"How did the fact that this is an open web interface influenced the use of the software in Pilsen (in the city and to the public)?"*
    - *"Do you have access to the average speed on every segment? Same with noise pollution."*

<u>Poll results</u>

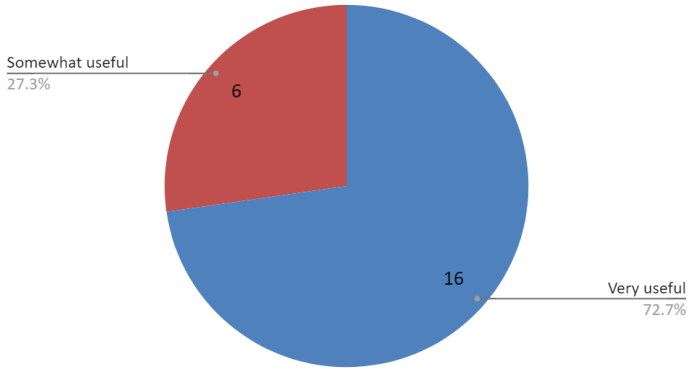
Q1. Do you work with traffic models (n=27)



Q2. How would you describe introduction to traffic modeling? Was it easy to follow? Hard to follow? Or way too easy? (n=27)

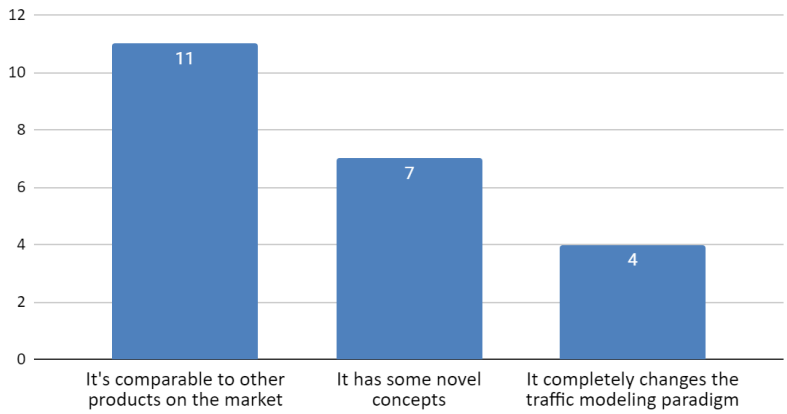


Q3. Do you find interactive work with traffic models useful? (n=22)



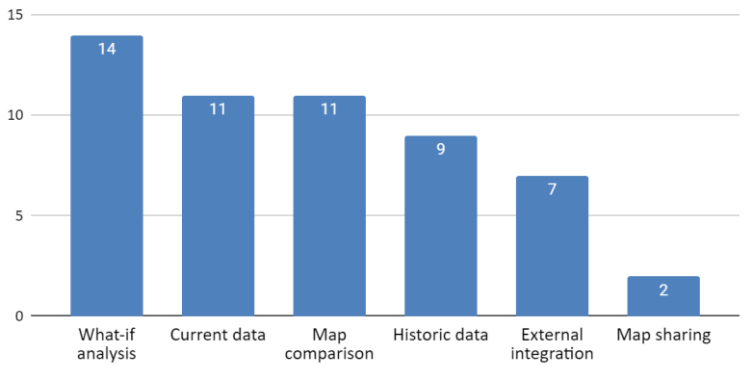
Do you find interactive work with traffic models useful?

Q4. How would you describe the Traffic Modeller? (n=22)



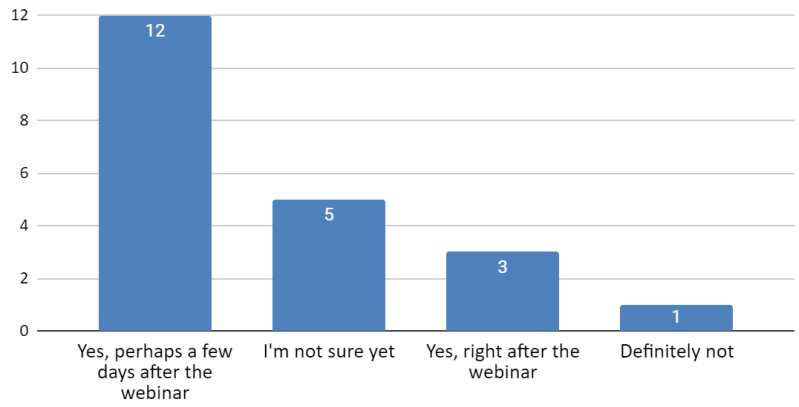
How would you describe the Traffic Modeller?

Q5. Which of the following TraMod features did you find most useful? (n=21)



What TraMod features did you find most useful?

Q6. Would you like to use the TraMod sandbox in the future? (n=21)



Would you like to use the TraMod sandbox in the future?

Post-webinar survey

Q1. Did you experience any technical difficulties either before or during the webinar?

- No difficulties (n=6)

Q2. How did you hear about the webinar?

- Facebook: 3
- Newsletter: 1
- Word of mouth: 3

Q3. What motivated you to join the webinar?

- Learn about the benefits of traffic modeling: 4
- Find out how cities are using traffic modeling to achieve policy goals: 2
- Learn about the Traffic Modeller solution (TraMod): 3
- Share my story with the audience: 1
- Find out more about the PoliVisu project: 2

Q4: What did you like most about the webinar?

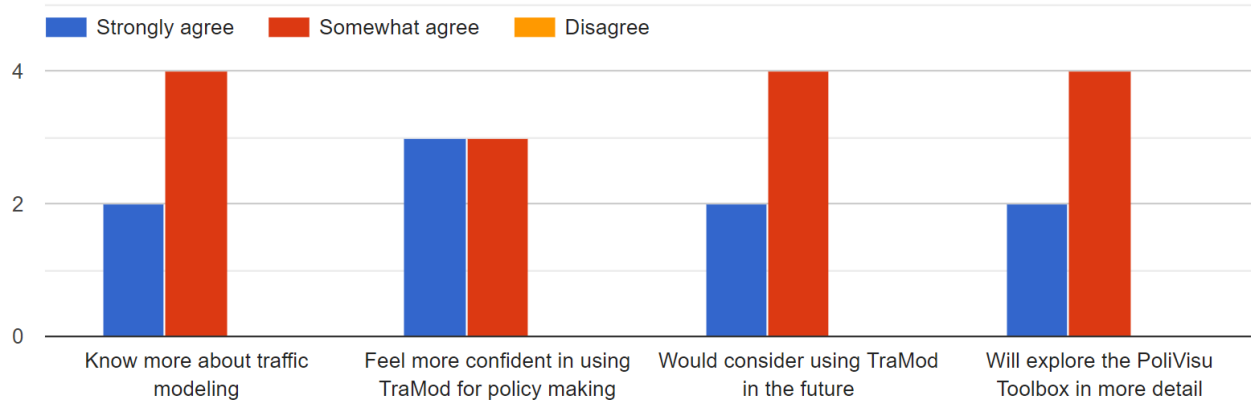
- “Traffic model. Live demo.”

- "Live demo of creating a closure in TM"
- "Good explanation."
- "An interesting simulation software"
- "The practical part."

Q5. What do you think could be improved?

- *"A video record can be sent to all the after the webinar which can be useful to access who missed the session."*
- *"Having live exercises with a data set can improve understanding for participants."*
- *"Probably testing the product with larger audience before presenting. I would suggest to use AWS product (load balancer) for testing."*

Q6. Please tell us whether, after attending the webinar, you



Annex III. MOOC Survey results

Q1. Were the purpose and learning outcomes of the PoliVisu course clear to you?

- Very clear: 37.5%
- Somewhat clear: 50%
- Not at all clear: 12.5%

Q2. To what extent were your expectations of the course fulfilled?

- Fully: 37.5%
- Partly: 62.5%

Q3. What did you enjoy most about your learning experience?

- *“Hands on map work.”*
- *“The quizes.”*
- *“Interacting with Issy, Plzen and Flanders maps.”*
- *“Interactive maps.”*
- *“Spatial visualization Techniques.”*
- *“Clear structure.”*
- *“The videos in the beginning + there is interaction with the forum”*

Q4. What do you think could be improved?

- *"OLC navigation."*
- *"I would have liked more insights in the technical workings of such visualizations."*
- *"Improve instructions."*
- *"Directional usage of the maps."*
- *"More practical tips and recommendations (software, visualization tools etc.)."*
- *“The questions asked in the last part weren't clear. You can not ask for help.”*

Q5. How many posts did you contribute to forum discussion?

- Less than ten: 87.5%
- None: 12.5%

Q6. How would you rate the quality of information shared in forum discussions?

- Somewhat useful: 87.5%
- Not useful: 12.5%

Q7. How would you rate the quality of hands-on activities? (1 = very bad, 5 = very good)

- 5 - very good: 25%
- 4 - good: 62.5%
- 3 - average: 12.5%

Q8. What was the most unexpected thing that occurred during the MOOC?

- *"Difficulty of questions."*
- *"Real city maps."*
- *"The forum."*

Q9. What did you gain most from taking part in the MOOC?

- Online communication skills: 25%
- Opportunity to learn more about data visualizations: 75%
- Awareness of data challenges and how to address them: 62.5%
- Knowledge of dynamic visualizations: 50%
- Insights into data driven policy making: 50%

Q10. Do you have any other comments?

- *"Improve navigation of the module."*