DELIVERABLE

D7.5 Recommendations for future deployments (It. 3)

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Table of Contents

List of Tables

List of figures

Executive Summary

This deliverable addresses PoliVisu's activities and evaluation during its third experimental iteration. To this end, it reports the activities and the related assessment to give specific recommendations based on the lessons learnt by the pilots and the project as a whole to improve the use of data in policymaking and to refine the pilots' solutions.

The main objective is to assess whether and how the proposed PoliVisu approach, processes, tools and use of big data are beneficial in the policymaking process.

The evaluation of this third iteration (« *Open Iteration* »), which lasted from September 2019 to February 2020, benchmarks its results following the formative and summative evaluations conducted by the pilots and related partners to refine their scenario execution, before moving to the final iteration.

During this penultimate iteration, the evaluation strategies allowed PoliVisu to identify a final evaluation scenario for all pilots, to finalise a training module for the project and to determine the role of the existing tools in the policymaking processes.

In this phase, it was possible to benchmark the status of the project and pilot success.

The evaluation and validation of this iteration was strongly focused on 3 perspectives:

- *Usefulness of tools/visualisations on policy making;*
- *usability of the tools and visualisation;*
- *potential role of the tools and visualisations on a policy making process;*
- *inclination and readiness of the various stakeholders' groups to adopt a big data approach.*

The huge number of participants in pilot activities shows the usefulness and interest of data visualisations and tools with a particular potential in the policymaking processes, clearly exposed by the participation in the project. 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 visualisations.

Pilsen officially adopted one of the tools of the project in the policy making processes, while Issy and Ghent obtained in-depth learning from their pilots, indicating promising results of the final iteration. Moreover, all pilots will need still a few months to have a complete vision of their results. To this end, they elaborated a final evaluation scenario to be implemented in the final iteration.

Furthermore, the additional pilots of the project, namely in Flanders, have been moved on in building their tools and those will make it possible to have results before the end of the project.

Finally, Training modules, supported by a dedicated evaluation, were built and they will be deployed in the last few months of the project.

1. Introduction

This deliverable is focused on the results of the first 3 iterations, with a particular focus on the third one, to propose recommendations to the technical and research team.

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.

The pilots and the project itself have conducted various activities (20 during this iteration), mainly following the evaluation framework.

Concretely, this has enabled project partners to directly involve policymakers and to move forward with their scenarios.

The result of the work at this stage, as described above and later in the document, was listed by the pilots and supporting project partners in clear recommendations to develop and implement the use of visualisations and tools.

During the latest iteration, a strong focus was dedicated to the use of visualisations and tools in policy making.

This document has four substantive sections:

- **Section 2**: presents the Formative evaluation and the activities conducted, including lessons learnt;
- **Section 3**: presents the summative evaluation conducted and the results up to now, including recommendations;
- **Section 4:** presents the final evaluation scenarios of pilots and the training plan of PoliVisu;
- **Section 5**: final conclusions with a synthetic vision of achieved results and solutions to overcome detected barriers.

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.

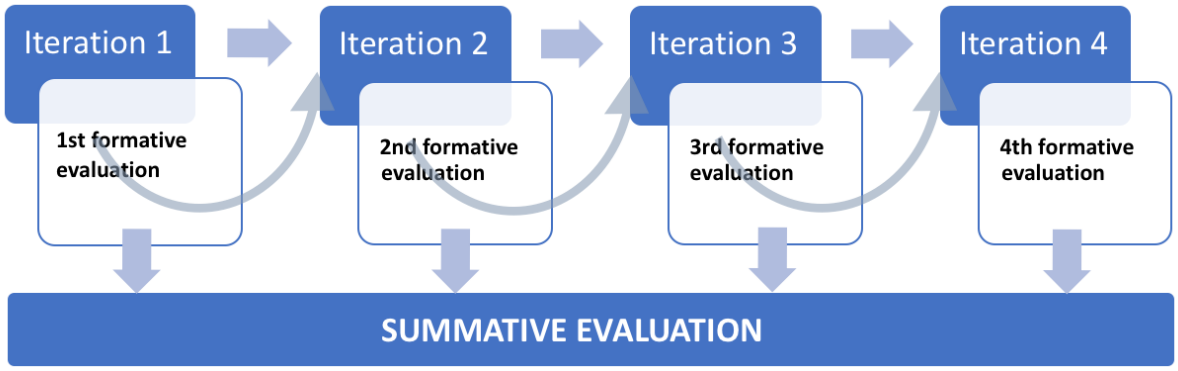

Figure 1. Relation between Formative and Summative evaluation

This section reports the formative evaluation steps taken during the third iteration by the pilot partners and the project in itself.

2.1 Open Iteration

In the latest cycle, called "Open iteration", opened the tests in real-life conditions to validate the pilots' scenarios to have a confirmation about usability and usefulness of the project concept and tools.

This cycle defined open tests with targeted communication to an open audience and in real conditions. To this end, the project has conducted some activities with targeted stakeholders to test the various applications resulting in valuable feedback.

From a users' point of view, this cycle was mainly conducted on users directly concerned by the use of those tools, allowing to receive feedback about:

- *The usefulness of tools/visualisations on policy-making;*
- *usability of the tools and visualisation;*
- *potential role of the tools and visualisations on a policy-making process;*
- *inclination and readiness of the various stakeholder's groups to adopt a big data approach.*

Moreover, the activities were mainly set up and based on two dimensions:

- Training/explanations about the tools and big data;
- participation in (organisation of) local events to showcase the pilots' solutions.

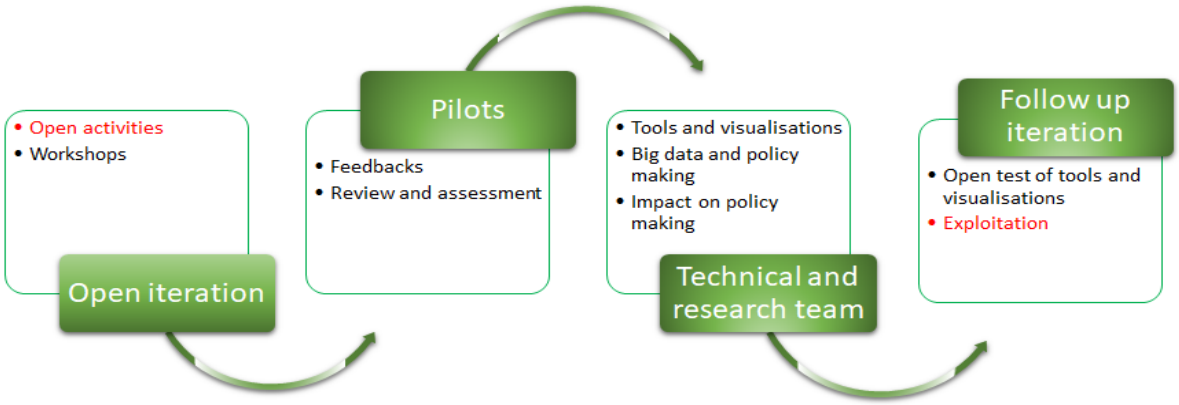

Figure 2. Open iteration to follow up iteration flow

Consequently, the various pilots were divided in 2 main streams:

- Available data and applications can be opened without any restrictions to external users to the consortium. This is the case of Pilsen and some pilot cases in Flanders;
- Available data can be opened with some limitations, but the applications can be published. This is the case of Issy-les-Moulineaux, particularly for the dashboard, as it requests that the data is used just in the framework of the project. Instead, the accident map in Flanders and the data obtained in the city of Ghent where the raw data cannot be shared but the visualizations are made available.

This had consequences on the type of activities that were driven by pilot partners, allowing Pilsen and Issy to drive activities also open to all users, while Ghent and Flanders had to work on activities mainly based on focus groups and workshops, in order to gather feedback.

Table 1. Activities and participants of iteration 3 ("Open iteration")

Pilot	Type of stakeholders	Activities	Participants	Externals	Feedbacks
Pilsen	Policymakers, public bodies	3	403	381	40
Issy	Policymakers, public bodies, companies, citizens	5	362	308	25
Ghent	Policymakers, companies	5	124	15	0
Flanders	Policymakers, public bodies, companies, citizens	7	67	42	31
Total	Policymakers, public bodies, companies, students	20	956	746	96

2.2. Evaluation activities

As explained in the previous paragraph, the choice of the pilot activities was defined according to the pilot applications status and the related data limitations.

Those activities were highly focused on the use of data for policymaking to detect potential limitations and to assess the usefulness and usability of the policy making model. The activities are less focused on testing the various tools itself.

The main barrier faced by pilots, next to data limitations, was the complex evaluation of the degree of adoption of the policy making model, also taking into consideration how the adoption of a policy or a measure takes time. This is related to procedures and the use of tools in an experimental phase, which can have a negative impact on users' trust.

To this end, the various pilots worked on a final evaluation scenario to be deployed during the last iteration of the project[1].

2.2.1 Ghent

The open iteration dealt with obtaining a full set of the definitive data. In the previous iterations the city of Ghent and Proximus[2] experimented with the definition of the profile of students. To this end a test set was defined to verify if students could be identified among Proximus clients. This was confirmed, and therefore, in the third iteration a complete dataset was constructed where students, inhabitants, commuters and irregular visitors of Ghent were identified.

Activities

The activities that have been conducted can be divided in three categories:

- The first category aims to finetune the data question with Proximus;
- the second category has the goal to obtain an agreement from all parties involved about the collaboration with Proximus and which data will be obtained;
- the third category aims to inform all parties involved in the collaboration with Proximus to obtain data and what this collaboration implies.

Table 2. Evaluation activities conducted by Ghent during iteration 3

Date	Wor. kshops/Activities	Participants	Externals	Feedbacks
September 27, 2019	Meeting with Proximus: starting up 2nd iteration of data collection + defining terms etc.	8	4	/
October 23, 2019	Workshop with policy makers during the GA meeting	25	5	/

[1] See section 4 of this document

[2] https://www.proximus.be/en/

December 9, 2019	Lunch Meeting about Proximus data for the civil servants	80	/	/
January 10, 2020	Brainstorm/workshop with Proximus: fine tuning possible results	5	3	/
February 24, 2020	End delivery of iteration 2 of the Proximus data exercise.	6	3	/

Lessons learnt

A great deal of information, of interest for different departments and offices, can be obtained from a single dataset. The same methodology used to identify students in a telecom dataset can be applied to identify inhabitants, commuters and people who do not regularly visit Ghent.

We also learned how important it is to set up a collaboration with parties that have specific expertise. This includes both partners who know the content of the policy issue and partners who possess the technical knowledge necessary to solve the data question.

Lastly, we learned the value of an iterative process to develop the tools or obtain the data necessary to tackle a policy problem. The iterative nature of the collaboration between the city of Ghent and Proximus allowed to define better different profiles that could be identified in the data, and situate these profiles in time and space.

2.2.2 Pilsen

During the open iteration, Pilsen managed to put two applications into routine operation and offered them to the public for use. The activities were advertised through media, such as public television, newspapers and professional magazines.

In this phase the involvement of policy makers and related stakeholders progressed. At the same time, more data is being added to the application according to their requirements. A contract has been started to run the Traffic Map as a software-as-a-service in a production mode.

Activities

In this iteration, Pilsen has worked on 3 tools:

- Traffic map in Pilsen - The Map of Traffic in Pilsen allows to analyse the traffic in the city, as measured at the 307 street segments with detectors (induction loops) installed. The traffic data is available for every day and hour since 1 March 2017.
- Traffic Safety Map - The Pilsen Traffic Safety Map was released during this iteration. It includes information about: traffic offences registered by the Municipal Police since 2015; and traffic accidents registered by the Police of the Czech Republic in Pilsen since 2016. These two data sources have been combined for the first time in this app based on the request from the Municipal Police and the Department for Crisis Management of the City.

- Traffic Modeller App - The application is divided into two parts into the public part, which shows traffic visualization from detector data and planned closures and roadworks. And the second part, which is closed to the public and helps to enter experiments and modelling of traffic before approving closures.

Table 3. Evaluation activities conducted by Pilsen during iteration 3

Date	Workshops/Activities	Participants	Externals	Feedbacks
September-October 2019	Map of Traffic in Pilsen user testing + online survey	372	368	28
10.10.2019 12.12.2019	Traffic Safety App Workshops	5	2	5
29.11.2019 3.2.2020	Traffic Modeller App Workshops	26	11	7

The most important activity was related to the Map of Traffic in Pilsen (https://mapadopravy.plzen.eu/). This application was circulated in the Pilsen's GIS newsletter and through the city website to the external users for an open group testing, together with a request to provide user feedback through an online survey.

As a result, 372 unique users visited the map during the month of testing within September and October 2019 (Google Analytics data). 28 users provided their testing feedback through an online survey which contained four questions evaluating the application on a 1-10 scale as well as shared qualitative feedback through open questions. The following table summarizes the scores on the four criteria (calculated as an average score on the 1-10 scale among the 28 respondents). It shows the progress since the previous Lab iteration testing when the older version of the application was tested.

Table 4. Open User Group testing of the Map of Traffic

Criteria	**Average score in the OUG (now)** **(1 min - 10 max)**	**Average score in the Lab Iteration (previous)** **(1 min - 10 max)**
Ability to understand the purpose	8,7	6,95
User experience	8,4	7,3
Practical Usability for day-to-day work/live	5,8	5,8
Expected frequency of use	5 (weekly)	not measured

As a result of the testing, several bugs have been identified and resolved. Also multiple improvements have been made in the app, ranging from fixing errors in data, through improving documentation and legend, adding FAQs, up to refinements in the user interface.

The version of the Map of Traffic that was released after the testing feedback had been implemented. This version is now available to the traffic experts and to citizens on the city website.

The result of the testing revealed that:

- The users could easily understand the purpose of the app and evaluated positively the user experience;
- progress has been made since the Lab iteration in both understandability and UX.

Moreover, this activity allowed us to confirm the expected frequency of use (approx. weekly) by mostly professional users in the transport domain (both public sector managers and private sector experts).

Lessons learnt

The operation and deployment of each application gives rise to awareness of target users about the applications as well as improves knowledge of the city managers (on datasets used, usefulness, possible outcomes), which in the future can help policymakers to better decision-making and management of the city.

For example, adding the state police data to the Traffic Safety Map so that all data is available in one app makes it possible to analyse traffic offences and traffic accident data in one interface for the first time. This may help the city representative to make decisions, but the question arises as to whether and how much information to provide to the public. This will be further discussed with the high-level city representatives.

After the final cycle of testing with a larger group of testers, the public can use the Map of Traffic as a final product, which sustainability is supported by concluding a contract with a supplier.

There is a large and repeated interest in the deployment of the Traffic Modeller application throughout the third iteration. The process of updating the closures in the application has been initiated, but the challenge ahead is to include more stakeholders and insert all planned closures and assess their impact on traffic.

Experimenting with the traffic model is a separate activity and Pilsen found two municipal organizations interested in experimenting with it. To this end, it will be necessary to develop this interest and to give the support to people to help them to learn how to work with the new tool. Once this will be achieved, it will be possible to propose and/or implement provisions for urban transport to have a complete evaluation.

2.2.3 Issy-les-Moulineaux

Issy-les-Moulineaux, keeping the structure of the first two iterations, during the open iteration, focused on the construction and the improvement of visualisation tools, but in this phase the involvement of policy makers and related stakeholders became more and more important.

It has to be noticed that this work was based on the 3 focus groups that were identified in the previous iterations, more precisely:

- An urbanism Focus Group, composed of various entities, including the City of Issy-les-Moulineaux and the urban agglomeration Grand Paris Seine Ouest (with support of companies based and/or collaborating with Issy). The main objective of this group is to introduce more and more data on daily activity of departments and policy makers.

- An information and communication Focus Group, composed of the Issy Média team (responsible for the whole communication of the City and visualisations in the Open Data portal), highly involved in finding good visualisations/tools to allow to link policy making and population.
- A data Focus Group, divided on various working meetings and composed of different potential providers of data and tools. This group has been mainly focused on identifying data and tools.

In this framework, Issy has worked on 2 tools:

- A dashboard with traffic historical data[3] (obtained from BeMobile) to allow to study hot traffic spots and the evolution of traffic after the start of roadworks, making possible to understand which are the most difficult zones and periods;
- An application, Myanatol, allows to combine Google Map algorithms, information and local tips from the City and artificial intelligence to make it simpler to travel. The application, on a particular segment, re-routes users on two different options studied by the start-up managing it and the City, according to various data, using, on request of the City, the same calculations and processes used by the dashboard, to allow to understand how the use of data in that format may have positive impact in defining re-routing with a positive impact on congestion.

Activities

As described, Issy has been working on two different and converging applications and scenarios to make possible to test a full policy making cycle and to improve the use of data in its daily decision-making processes.

To this end, Issy has been working with its three usual groups of users, but, in parallel, improving its dashboard with the involved partners and launching a fully opened activity with the start-up MyAnatol. Moreover, Issy has organised a workshop with key decision makers of the City and the urban agglomeration to gather potential feedback on the experimental tools and activities to be able to use that information to define the status of readiness to the adoption of the policy making model.

Table 5. Evaluation activities conducted by Issy during iteration 3

Date	Workshops/Activities	Participants	Externals	Feedbacks
All period/monthly	MyAnatol preparation	8	5	5
All period	Dashboard building and improvement	15	0	5
From 01/01/2020 to 29/02/2020	MyAnatol pilot	294[4]	294	Not applicable[5]

[3] October 1, 2017 to October 1, 2018 of the whole Paris Region
[4] Users downloading the app, people interacting with us
[5] This activity is still ongoing and the evaluation will be mainly driven through the use of data crowdsourced, results will be available in late spring 2020

Date	Workshops/Activities	Participants	Externals	Feedbacks
30/01/2020	Workshop with policymakers	30	7	7
All period/monthly	Communication Focus Group	8	0	6
30/01/2020	Data meeting with BeMobile	7	2	2

The activities about the involvement of the policymakers and MyAnatol have been the two core ones during the iteration, in detail:

- Workshop with policymakers: This activity involved 3 deputy mayors and 4 directors of key departments[6] with a direct interest in mobility and/or data. The workshop was organised in Issy, with the participation of all partners. This activity was managed through various presentations of the project and the tools, followed by an open brainstorming.
- MyAnatol pilot: Issy has defined with this start-up a collaboration to test this tool to make possible to have a complete policy making cycle. To this end, monthly meetings have been done since September 2019 (up to june 2020) to set (and later follow) the pilot. This activity is based on a street marketing campaign to involve citizens, but it also involves the urbanism focus group to evaluate the "City side" on the use of this application. The street marketing campaign was defined through the distribution of dedicated brochures at a particular spot situated in the main street identified to have congestion. Two people proposed to people stuck in congestion the brochures and, whenever possible, to have some talks about the advantages to use MyAnatol. The evaluation of the citizens involvement and the real participation is done through analysis of big data, while usefulness for the City and the positive outcomes are evaluated from a more qualitative point of view.

Lessons learnt

The activities launched have shown how the use of data is today fully accepted by the decision makers and the core management group of the municipality. This is not just related to mobility or floating car data, but to the use of data on a larger spectrum. This is considered a fundamental point for Issy-les-Moulineaux data strategy and it is confirmed by the building, in parallel, of dashboard on data, to share information between services and policy makers, in various key departments (civil register, environment, finance, urbanism, health, sports, culture, commerce).

Moreover, if the tools are not yet fully validated as the activities will end during the summer 2020, it is possible to identify various important lessons learnt during the activities driven in during the first three iterations and the use of car floating data:

[6] communication, sustainable development, urbanism, public spaces, Smart City, GIS

- If historical data is fundamental, as highlighted by the municipal departments, it is also true that data needs to be highly recent or, ideally, to be updated in real time to allow to make decisions and to have a full use of tools;
- Some doubts are raised by policy makers about floating car data as long as this is covering a small share of cars (3-5%) as it happens with BeMobile data;
- Useful data requests a high-level investment or it is not available, particularly in the domain of mobility that is not directly part of the jurisdiction of a municipality;
- The extreme division of jurisdiction between various entities impacts the introduction of new services. As an example, the application of MyAnatol, making possible to communicate to the population through data, is today possible as it is used just by Issy, but, in case its neighbouring cities will adopt it, it will make necessary to federate the decision making process between them, to avoid contradictory communications.

Figure 3. Workshop with policymakers in Issy-les-Moulineaux

Moreover, taking into consideration that this process is still in progress, it has been detected that citizens and civil servants show enthusiastic reactions immediately, while they become much more reluctant, while having a direct impact with the tools. Consequently, actions are taken to involve more the citizens, through an improved street marketing strategy, and civil servants, through dedicated workshops and training activities with the support of the tools of PoliVisu.

2.2.4 New pilots: Flanders Region, Mechelen, Voorkempen

Within the Flanders region, three additional PoliVisu pilot projects have been defined under supervision of AIV: (i) School streets - City of Mechelen, (ii) Flanders Traffic Safety Map - Flanders region and (iii) ANPR data analysis - Police zone Voorkempen. A Police zone is a region of one or more local communities that work together. The head of the Police and the mayor of each of the police zones are responsible. The zone Voorkempen is situated North of Antwerp and comprises Brecht, Schilde, Zoersel and Malle.

Activities

These additional pilot projects have been started later during the project. Project partners represent them without extra budget. Hence, these pilots will use an *ad hoc* evaluation driven in the last iteration of the project. This evaluation will be mainly conducted through interviews and a survey of a limited group of stakeholders.

In any case, those will have activities through some workshops and related activities on the three tools that were built[7]:

- School streets (City of Mechelen)
- Traffic Safety map & dashboard (Region of Flanders)
- ANPR data analysis (Police Zone Voorkempen)

Table 6 Evaluation activities conducted by Flanders during iteration 3

Sub pilot project	Date	Workshops/Activities	Participants	Externals	Feedbacks
Mechelen school streets	3/2/20, 17/2/20, 6/3/20	Mechelen Schoolstraten sprint reviews	9	4	7
Mechelen school streets	16/9/19	Brainstorm about schoolstraat concept	10	5	3
Mechelen school streets	18/11/19	Design session schoolstraat dashboard	11	7	5
Traffic Safety Map	5/12/19	Feedback gathering sessions representatives of Federal Police	15	13	7
Traffic Safety Map	All period	Dedicated progress meetings with Flemish government organizations and Federal Police	10	4	4
ANPR data analysis	20 Jan 2020	kick-off local police Zone Voorkempen	12	9	5

Lessons learnt

The quantity of traffic and the general traffic safety are two highly important aspects of modern society. Stakeholders of different nature have shown interest in their wish to significantly increase the road safety and drastically lower the number of injuries and fatalities. Both citizens, policy makers and law enforcement organizations have a high interest in easily readable visualizations to help optimize traffic safety. The head of the Police and his mobility team at the zone Voorkempen immediately saw the possibilities of the active policy

[7] The applications and the strategies are explained in paragraphs from 3.1.7 to 3.1.9

against speeding by using the speed control zones and the traffic accidents in the Policezone as displayed on the Traffic safety map.

School streets - City of Mechelen

Fast improvements with digitalization are feasible in school environments: open datasets and relevant dashboards provide information from existing sensor data, enriched with additional datasets providing secondary information, enabling users to perform in depth analysis during the policy making and policy evaluation processes.

Traffic Safety Map - Region of Flanders

When entering the field of traffic accidents, the context of data privacy and data ownership makes the exercise more complex: disclosure of data subject to privacy legislation may lead to unintended juridic consequences. Various government entities need to agree on the specific use of this data to make this pilot project successful.

ANPR - Police Zone Voorkempen

Big data offers the possibility to have in depth analysis of very detailed traffic information. The first learnings were that the introduction of ANPR cameras are an excellent way to reduce the amount of speed offenders significantly, leading to a drastic improvement of Traffic Safety in local communities.

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 judgement of the project effectiveness at this stage.

The Open iteration was implemented following the methodology and the process reported in the evaluation plan without major deviations. Moreover, KPIs, as reported in table 8 below, were mainly met, as all pilots could meet the due KPIs.

The huge number of participants in pilot activities shows the usefulness and interest of data visualisations and tools with a particular potential in the policymaking processes, clearly exposed by the participation in the project. 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 visualisations.

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.

However, it is now possible to identify different bottlenecks that were met in the deployment of pilots and in the evaluation process, as summarised in the table below.

Table 7. Lessons learnt in PoliVisu after 3 iterations

Lesson learnt	Ghent	Pilsen	Issy-les-Moulineaux	Flanders
Limitations related to data ownership	X		X	
Fragmentation of Data	X	X	X	
Fragmentation of jurisdiction		X	X	X
Data privacy issues	X			X

These lessons learnt have also allowed to highlight some limitations on the evaluation process in itself, more precisely:

- Evaluating a policy making model is not always possible, also due to the different processes in the various Cities and countries. In any case, it has become clear how observation is the best way to understand how Cities can improve their mechanisms.
- The use of various tools complicates the adoption of a dedicated KPI for the acceptance of use, as it is not effective to use an average of the different tools. Consequently, it becomes necessary to have a more qualitative evaluation to detect the real impact that those have.

Moreover, it needs to be underlined how some of the KPIs have not been yet applied in this document as the activities will take place in the next iteration. This is the case of the training activities of the project[8] and the KPIs related to exploitation.

Table 8. Status of the Summative evaluations KPIs

[8] As reported in "D8.8 PoliVisu Training modules"

A) The ***acceptance of the tools*** used to make big data useful to the policy-making process			
ID	**Outcome**	**Success criteria (KPI)**	**Result after 3 iterations**
A1	Number of surveys	40	172
A2	Acceptance of the model	80% overall	NA
A3	Usability of the model	90% overall	NA[9]
A4	Expert lens interviews	20 interviews	
A5	Acceptance of the tools	80% overall	87,0% (Pilsen)[10]
A6	Usability of the tools	90% overall	58,0% (Pilsen)[11]
B) The effectiveness of big data use at a policy level			
ID	**Outcome**	**Success criteria (KPI)**	**Result after 3 iterations**
B1	Necessary data has been mapped and data models are available	Number of datasets mapped and used in visualisations	11
B2	Stakeholders collaborating	100	717
B3	Policies explored	30	12
B4	Policy decisions	12	1
B5	Trainers trained	3	See section 4.4
B6	Training events	2	See section 4.4
B7	People trained	20	See section 4.4
B8	Satisfaction of trainers	90% overall	See section 4.4

[9] See paragraph 3.3

[10] This is a preliminary result, being a single and early result of Pilsen, a more precise idea will be possible in the next iteration. Results in Issy are not mature enough to be reported.

[11] See note 3

B9	Satisfaction of trainees	90% overall	See section 4.4
B10	Increased understanding of trainees	90% overall on skills improvement	See section 4.4
C) The transferability of the PoliVisu tools, methods and processes			
ID	**Outcome**	**Success criteria (KPI)**	**Result after 3 iterations**
C1	Clarity of the impact of the tools	70% overall	84,0% (Pilsen)[12]
C2	Success stories	3	1
C3	Follower cities	3	3
C4	Cities contacted	300	16[13]
C5	Business plan	Tested by partners and potential end users, feedback from 3 external experts	Iteration 4

3.1 Acceptance of tools: usefulness and usability of tools

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 visualisations in all pilots. This had an impact in the evaluation of acceptance, particularly on the KPIs related to it.

To achieve an evaluation about the acceptance of these tools is necessary to have a more qualitative evaluation tool by tool, also taking into consideration the environment in which they are used and the targeted user.

In this section, every application is analysed, taking into consideration the degree of its development, the ongoing use and/or the potential of it in the near future. This allows a clear evaluation of the usefulness and the usability of those.

3.1.1 Visualization of the location of students, inhabitants and visitors of Ghent

In the third iteration together with Proximus new profiles were defined: students, inhabitants, commuters and irregular visitors of the city. These profiles will be visualized in time and space on a map of Ghent. Different offices and departments within the city can use the data for their policy questions.

[12] See note 3

[13] This is just a preliminary figure, Cities will be contacted more and more following the progress of tools.

The results of this new exercise will be obtained by the end of March. However, the results of the first iteration of the data-collection from Proximus resulted in different preliminary visualisations that can give an idea of the final visualisations.

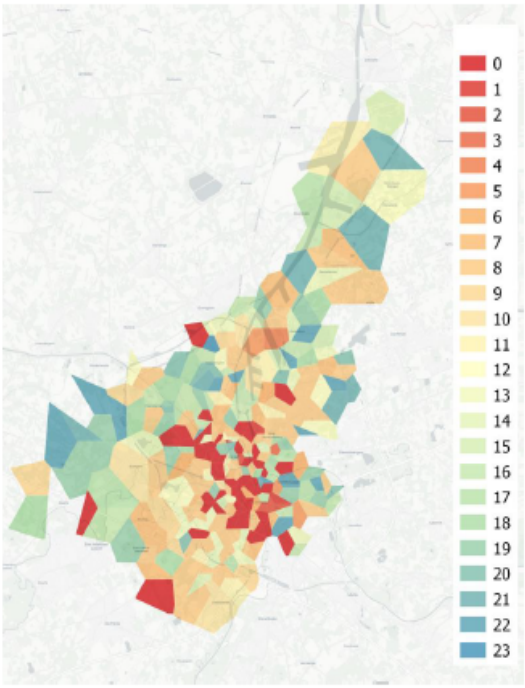

Figure 4. For each cell, the hour is indicated in which, on average, the highest activity is measured

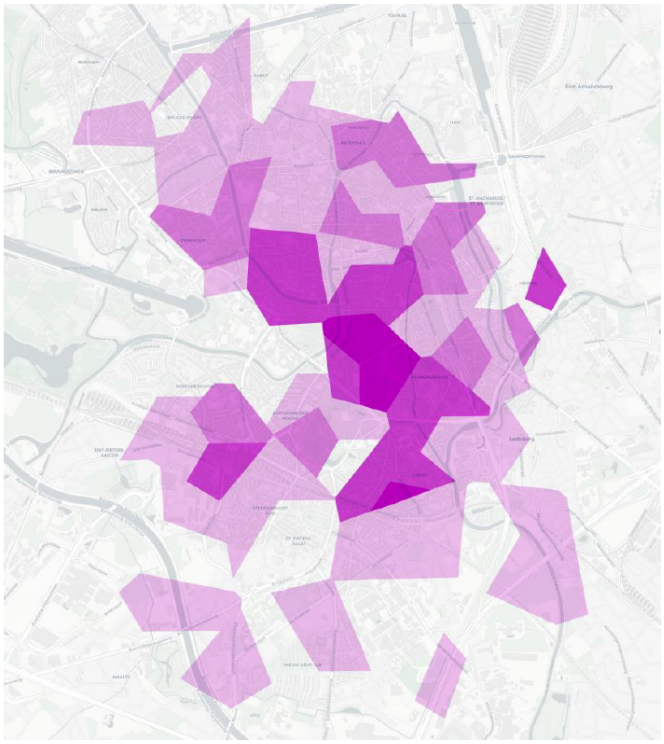

Figure 5. locations with the highest potential student activity during the day (6am - 6pm)

3.1.2 Pilsen Traffic Safety Map (WebGLayer)[14]

That application, developed by Innoconnect, shows the traffic offences registered by the Municipal Police since 2015 and traffic accidents registered by the State Police since 2016. These two data sources have been combined for the first time in this app based on the request from the city. The tool was developed in cooperation with the Police and the Department for Crisis Management of City of Pilsen.

During the open iteration, the application is fully developed, but it is not yet made available to public as it is on hold waiting for the decision of the municipality to release it. The issue in question that is currently being considered by the responsible city managers is whether (some of) the Municipal Police data included in the map should be made open. If the approval will be given, the application will be open and it will be evaluated through a survey.

Furthermore, it is planned to update the application, during the final iteration, with data from the segment radar measurements (trajectory control). This improvement will extend functionality with radar measurements, making possible to test the application and set up automatic data update processes. The new version will be introduced to officials and later to municipal authorities. This will make possible to close the policy making cycle and to decide whether the application will be for internal use only or released to the public.

Towards the end of the project, the results of this evaluation will be presented to the political representatives, such as the Smart City Commission, the City Council and/or the City Assembly.

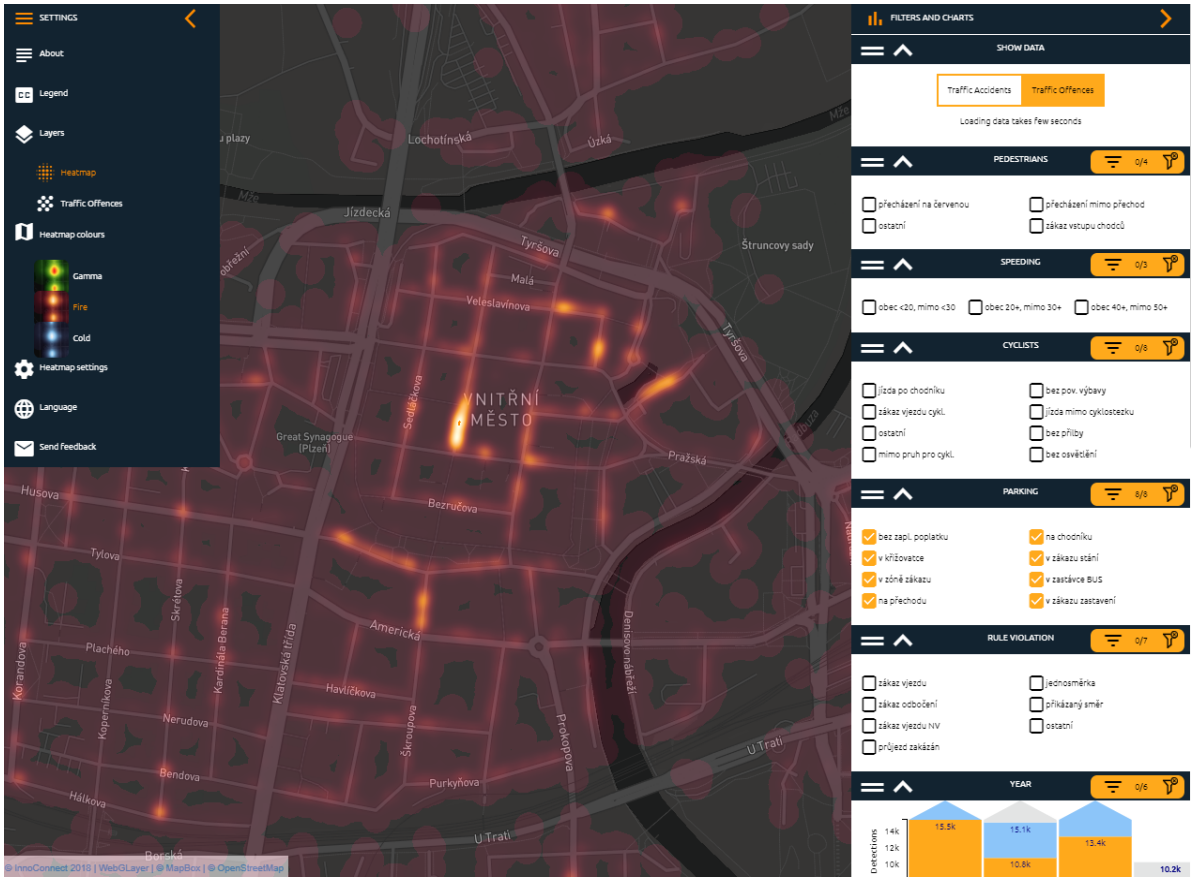

Figure 6. Screenshot of Pilsen Traffic Safety Map

[14] https://bezpecnostdopravy.plzen.eu/

3.1.3 Map of Traffic in Pilsen (WebGLayer)[15]

The application allows to analyse the traffic in the city, as measured at the 307 street segments with detectors (induction loops) installed. The traffic data is available for every day and hour since 1 March 2017 and is updated daily. It was developed by Innoconect with support of EDIP that provided the streets' capacity data. This tool was developed in collaboration with the City company in charge of the management of the public property for data of detectors.

The application is public and it is published on the city website, consequently it was tested during the open iteration. During its deployment, an evaluation was carried out through the mean of two surveys proposed to a group of experts. Later, once the application was opened to the general public, a survey was made available to the public to provide feedback.

After the evaluation, the City decided to fully adopt this application, by signing an official contract with InnoConnect to run and maintain this application also after the end of the project. To have better insights in its use, during the last iteration, Pilsen will use Google Analytics to evaluate the application usage.

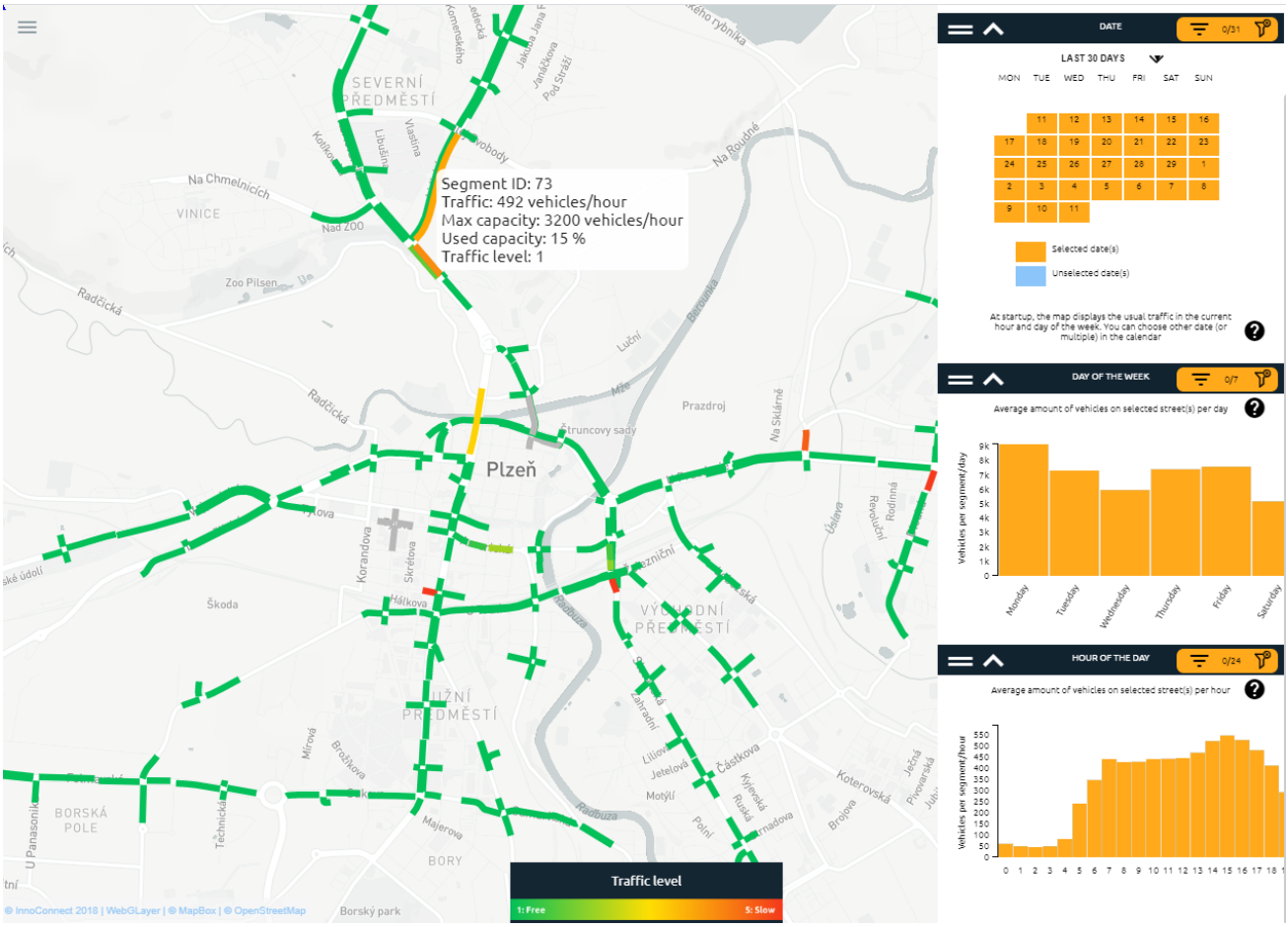

Figure 7. Screenshot of Pilsen Traffic Map

[15] https://mapadopravy.plzen.eu/

3.1.4 Pilsen Traffic modeller

Pilsen, in the framework of the project, developed an application that is divided into two parts: a public application for visualisation and a non-public application for experiments. Actually, the online version allows to see the traffic intensity (in the past and estimates it in the future) in case of future road closures or roadworks, while the one not yet available for all is about experimenting the consequences on traffic of road closures.

3.1.4.1 Traffic Modeller (public): Traffic intensity visualization)[16]

That application, developed by Plan4All with the support of EDIP and HSRS for the traffic model, shows the traffic intensity in the past in the places where traffic detectors are located and visualizes the expected traffic development in the future based on the traffic model and scheduled closures.

This application was developed in collaboration with the Management of the public property (SVSmP), the Information Technology Administration of the City of Pilsen (SITMP), the department of Transport (City of Pilsen) and the Urban Planning and Development Institute of the City of Pilsen (UKRMP).

During this open iteration, it was proposed to the public a demonstration and a dedicated training based on the presentation of the traffic in the past from detectors and model of traffic in hourly iterations based on planned closures. Finally, the application was published on the city website to allow everyone to use it.

During the last iteration, the use of the tool will be analysed through google analytics.

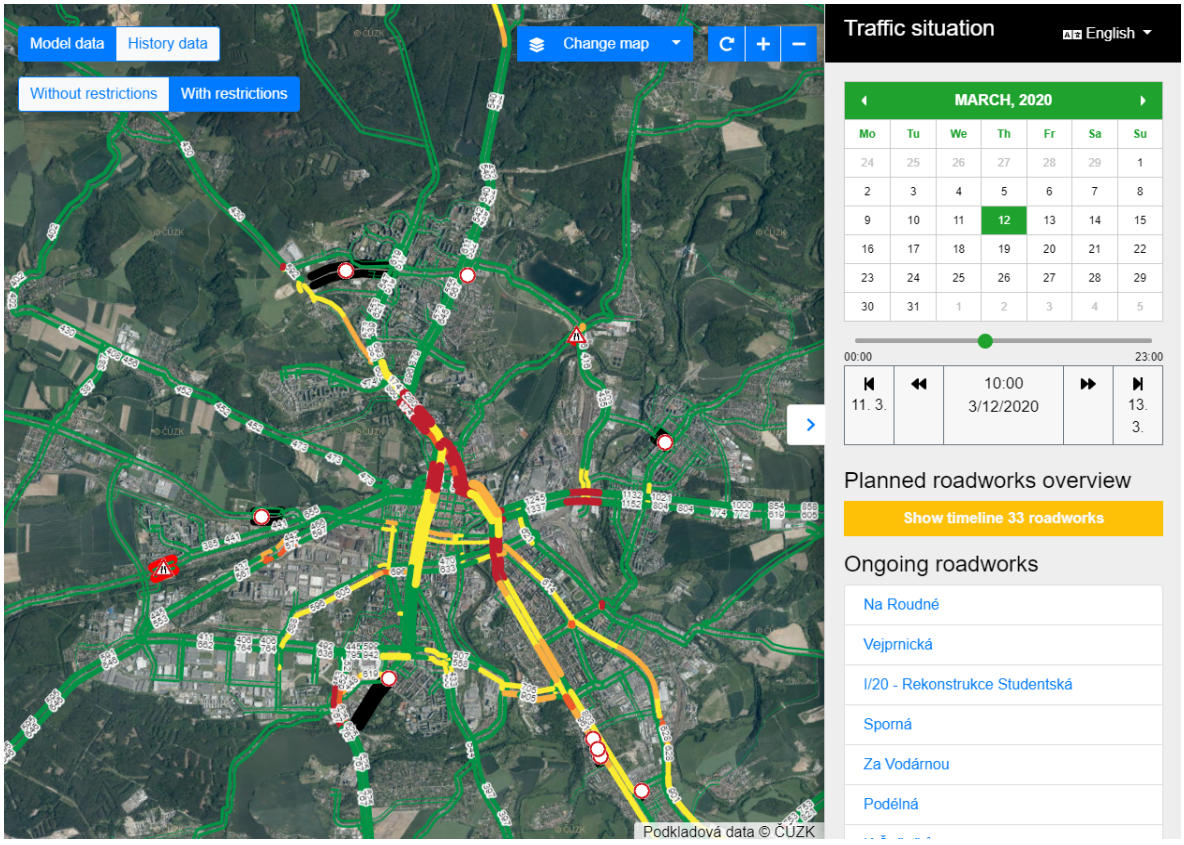

Figure 8. Screenshot of Pilsen Traffic Modeller (public)

[16] https://intenzitadopravy.plzen.eu/

3.1.4.2 Traffic Modeller (non-public): Traffic model experimentation

This version of the application, based on similar basis, allows to define experiments, traffic models based on selected closures and to publish the approved closures. This version was defined with various departments of the City and, for the experimental part, Pilsen is talking to the Pilsen Region and infrastructure network administrators' companies to involve them.

During this iteration, it was created an access based on user accounts. This was tested within the involved organizations and approved. That improvement is still tested with a feature allowing users to submit approved road closures to publish them into the public version of the application.

In the final iteration, a collaboration will be defined with the developers to make this collaboration effective also after the end of the project.

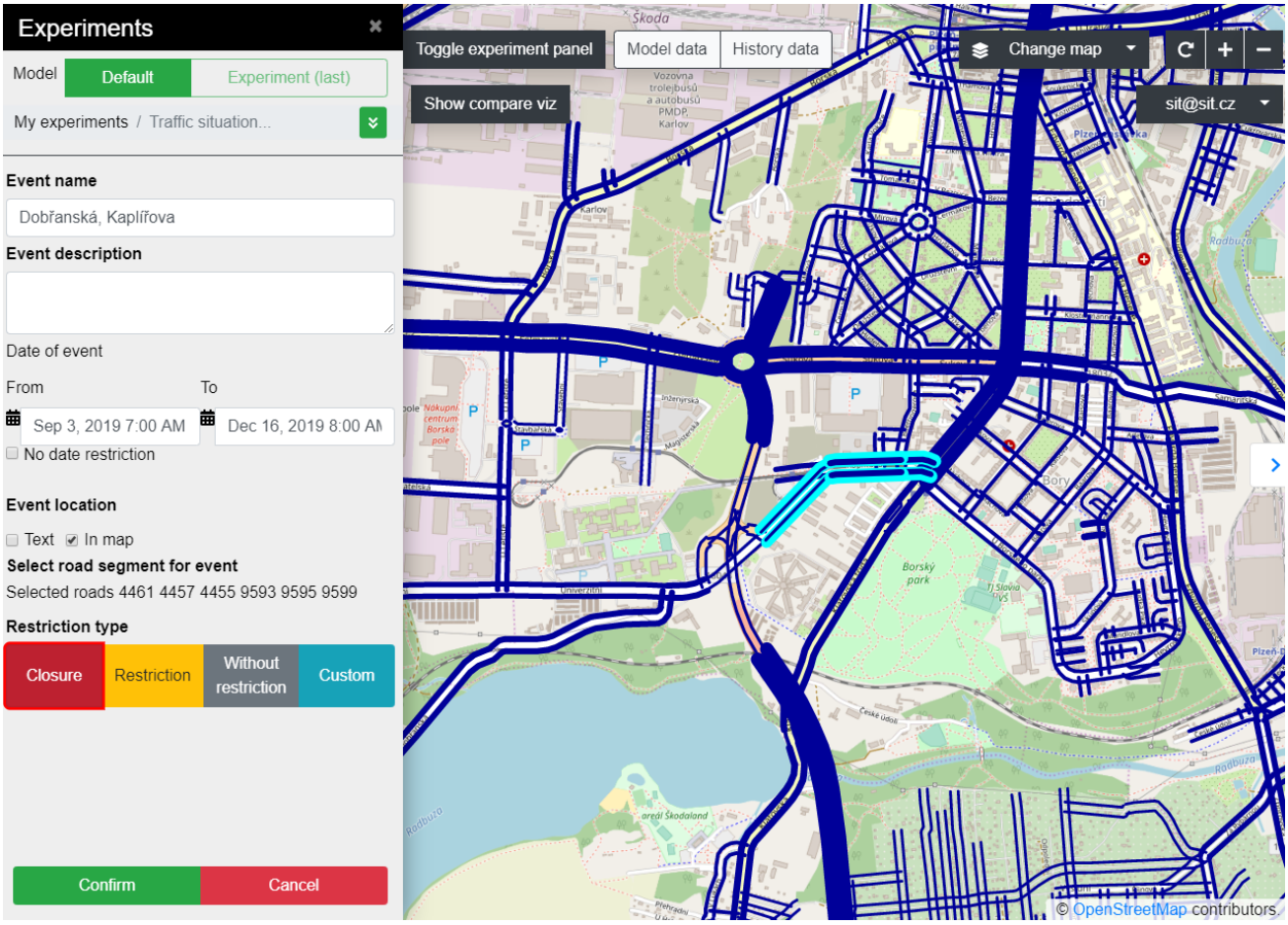

Figure 9. Screenshot of Traffic modeller (non-public)

3.1.5 Issy Traffic Dashboard

During this iteration, the Issy Traffic Dashboard created during the previous one was highly improved by involved partners (GEOSPARC, AIV, SenX, ATC) following various two-weeks long sprints. This improvement Traffic Management dashboard, with existing data for now (2017-2018), is a high-level mock-up supposed to help the users to understand the impact of roadworks and the introduction of new mobility solutions.

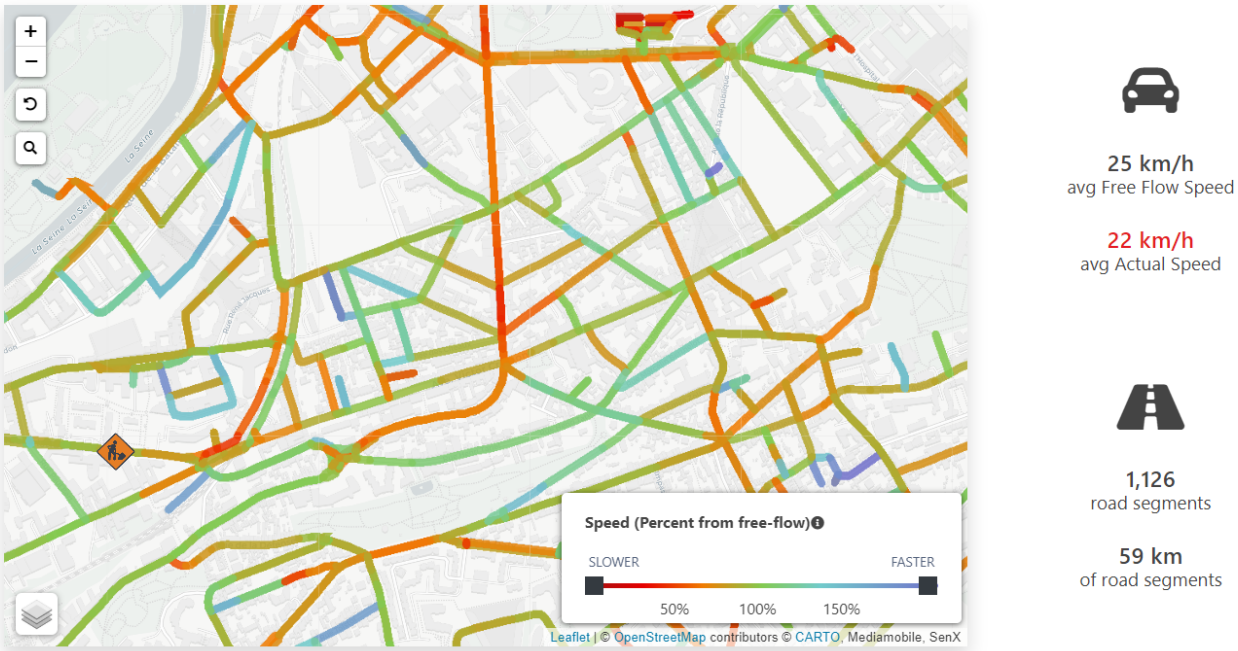

Figure 10. Screenshot of Issy Dashboard (detail)

This effort was done to have feedback from policy makers and decision makers about the usefulness of such solutions. Moreover, it was used to make some data analysis to define some hot spots for traffic, before cross-checking this data with the TomTom one for the deployment of the pilot with MyAnatol (see next paragraph 3.1.6).

According to results and feedback, this type of solution was considered valuable by the policy makers that were questioned, but they consider that, to have a full adoption, it is necessary to improve the data enclosed in it (in real time and with the detection of all vehicles) and to improve the tool with a dedicated design, but, next to this, this kind of dashboard has the potential, next to evaluation, to define new policies and to improve existing ones.

3.1.6 Issy MyAnatol application

Issy is working with a startup (MyAnatol) on a pilot about the use of an application (Google and Apple stores) that provides routing to all users with a different approach if compared with "Google approach" apps as it allows the City to define routing instead of an algorithm based one (and taking into consideration also information that is not that "data").

Moreover, the City can include messages in the app (like "please slow down, you are approaching a school"). To define the proof of concept, the first step has been, thanks to the BeMobile data and the dashboard, to identify a particular point experiencing more traffic than other segments. Those segments have also been chosen on the base of "non-data" information, such as the location in areas with many companies, considered particularly sensitive to any congestion issues. To this end, later, some routes have been observed, also based on Google and Waze proposals on a particular journey from point A to point B, on a 4 weeks period with TomTom data to confirm the location and to define alternative journeys to the ones proposed by Google and Waze, taking also into consideration information that cannot be included in the traffic data. To make this preparation possible, regular monthly meeting were set, from September 2019, with the participation of MyAnatol, Issy Média, the City (departments of public spaces) and the urban agglomeration (GIS and mobility).

Once, defined the zone and the deviations, the pilot was planned, following this schedule:

- First Street Marketing campaign to involve users[17]
- Deployment of a dashboard to evaluate the pilot (February 2020)
- Launch of a Landing Page about the pilot (February 2020)
- First feedback (February 2020)
- New street marketing campaign (March - April 2020)
- Second feedback (April 2020)
- Action plan for the final phase
- Final results (summer 2020)

Figure 11. MyAnatol landing page of Issy pilot

During the evaluation, based on data defined in the evaluation dashboard, just the traffic data about one street is supposed to be analysed to evaluate the effectiveness of the Information approach. Next to this, behavioural changes of users will be studied (data generated by the app like "how much do they accept my proposal", "how many downloads of the app"...).

3.1.7 Flanders Schoolstraten dashboard

Together with the City of Mechelen and the Lyceum in Mechelen, PoliVisu is digitizing the "Schoolstraten" project: at the start and the end of each school day, the street in which the school is situated is closed for motorized traffic for a short period in time. On March 2nd 2020, the schoolstreet was officially introduced.

The intended impact of the new policy is to reduce the number of motorized vehicles in the street of the school, with a minimal impact in the surrounding area, while the number of pedestrians and bicycles should increase drastically.

[17] Brochures distribution at traffic lights in the defined area (December 2019 - January 2020)

The Polivisu technical solution stack is based on a combination of sensor data collected from Telraam,[18] a citizen driven open data platform providing insight in the quantity of local mobility, enriched with MACQ mobility solutions managed by the city of Mechelen.

An interactive dashboard provides insight of the safety situation to policy makers, the city of Mechelen and the school board, as well as to local stakeholders such as parents and neighbours of the school. Specific visualizations provide insight in the amount of traffic per type: pedestrians, bicycles, cars, heavy traffic within the schoolstreet and in the vicinity. A user can select historical data to analyze data from a certain period in time, or to make a comparison between two specific periods.

The open dataset is enriched with local weather data, which provides the opportunity to get more insights in specific circumstances in case data points indicate a deviation from the typical traffic profile of the street.

The evaluation of these pilot projects will be conducted through interviews and a survey to a limited group of stakeholders, involved in this project:

- Smart Cities responsible of City of Mechelen
- Mobility responsible of City of Mechelen
- Executive board of the School
- The project leader of the technical project partner Transport And Mobility Leuven / Mobiel 21.

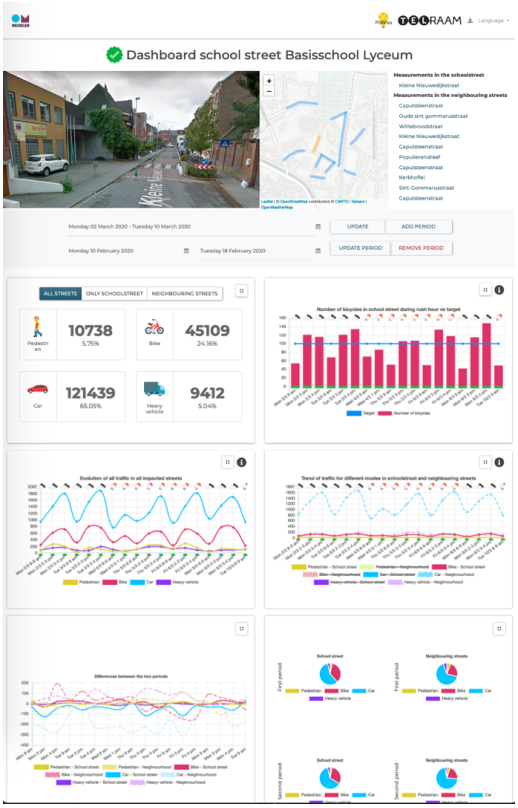

Figure 12. Screenshot of Telraam pilot dashboard

[18] www.telraam.net

3.1.8 Flanders Traffic Safety Map (WebGLayer)[19] and Traffic Safety Dashboard

Polivisu provides a visualization about traffic accidents, based on an open dataset originating from Police Reports. An informative map has been built within PoliVisu, an extensive dashboard with multiple informative graphs is in development.

The strategic objective of this project is to bring together different stakeholders to use the same visualization based on deep analysis of traffic safety and WebGLayer tools. The ultimate goal is that policy makers on local, regional and federal level benefit from this taking specific conditions into account. Additionally, local Police Zones might benefit as well from the Polivisu tools as a quality monitoring system, in order to improve the quality of their Police reports.

The group of stakeholders are defined as follows:

Local level (within Flanders region) ● Police Zones ● Councils and administrations ● Groups of citizens: communities, associations	Regional level (Flanders) ● AIV: Agentschap informatie Vlaanderen ● AWV: Agentschap Wegen en Verkeer ● VSV: Vlaamse Stichting Verkeerskunde
Federal Level (Belgium) ● VIAS Institute ● Federal Police	European level: ● Europol

Recruitment of participants from the above group of stakeholders is achieved by:

- network gatherings of these groups
- co-creation workshops (10/15 people)
- MACQ innovation labs (50 people)
- PoliVisu partner's network activities & conferences
- TRAFDAG Digital Flanders (300 people)

The eventual intended behaviour of the stakeholders is to gain full trust and cooperation between the government bodies, based on transparent and qualitative data and its visualizations. To be able to achieve this level of trust, alignment on data ownership, data privacy is a crucial requirement. We need to take into account that visualization of traffic accident data should not lead to disclosure of individual cases, with potential aggravating circumstances and criminal consequences. Hence, getting full clearance on specific use cases is very important.

[19] https://accidentsflanders.innoconnect.net

3.1.9 Flanders local ANPR data analysis

The Polivisu partner MACQ is owning the workstream, together with the pilot customer: the local police zone "Voorkempen" in the province of Antwerp, Flanders.

Polivisu provides an in-depth analysis of the anonymized ANPR dataset on local roads in the 4 communities in this police zone: Brecht, Malle, Schilde and Zoersel. 260 million records over 32 months have been analysed, mainly regarding speed of traffic. This has been presented in a powerpoint presentation to the pilot project team. Within the closing stages of Polivisu, we are analysing which applications can be built based on this analysis.

3.2 Use of Big Data in policymaking

As already mentioned in various previous documents of PoliVisu[20], in the first two iterations the effectiveness and the readiness of public administrations to the use of big data in policy making was already investigated.

If during the first two iterations, the project mainly analysed the impact of co-creation processes and data, on various facets, this latest iteration has allowed to have the first feedback about the participation of a wider public. This participation, at first impact, was particularly important as, on the two pilots working on those open activities, Actually, more than 600 users showed interest and accepted to participate. This participation cannot be yet fully evaluated[21], but it is already possible to state that, 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[22].

Furthermore, this iteration allowed to confirm 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*".
- 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 visualisation for policy making purposes, giving limitations to the use.

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

[21] Activities are still ongoing, and it is necessary to evaluate results on various months to have reliable results.

[22] D3.8 Data driven policy making: pitfalls and suggestions for Public Administrations

3.3 The Policy Making model acceptance

In between the second and the third iteration, with the third one concerning the implementation of experimental activities in real-life conditions by the pilots, it was possible to learn some important lessons about the use of the policy making model. The latter represents a reference scheme that allows both to orient and to evaluate the activities focused on the use of data in policy making processes.

- Concerning the **orientation** side, for each stage of the model (design, implementation, and evaluation of a policy) specific data-related activities have been identified that allow public administrations to extract value from data, making the policy making process a data-supported policy experimentation cycle.
- Concerning the **evaluation** side, instead, the model becomes an analytical tool that allows, through the reconstruction of the pilots' activities, to understand if and how they have internalized the inputs proposed by the model relevant towards the establishment of a culture of *Datacy*.

For this reason, rather than acceptance, it is preferable to talk about 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 policy making approach.

Three levels of compliance with the model were thus considered in the evaluation:

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

In the **first** level, the evaluation criterion takes on a purely qualitative dimension, since this awareness can be conceived as the attitude of the pilot toward deeper reflections on the role of public administrations in the digital age. Such reflections concern the impacts of data both at the policy making level (what opportunities does data offer to make policy processes more efficient?) and at the governance level (how does data redesign the relationships and the roles within a decision-making structure?).

In the project, it is possible to qualitatively assess this level of compliance based on the active contribution of each pilot to the evolution of the policy making model through exchanges of reflections, discussions and active engagement.

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. Exchanges with Issy-les-Moulineaux have provided important insights into the effects of data on governance and on the functioning of public administration. Finally, Pilsen has played a less decisive role due to the more "technical" nature of the experimentation that the city is implementing.

As far as the **second** level is concerned, the criterion 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 approaches to policy making and to establish relationships with different partners. Pilsen is in a pre-experimental phase, where the goal is to develop technical tools to be adopted in future experiments. 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.

As in the previous case, 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 objectives of the project.

Among the pilots, Issy-les-Moulineaux involved several actors of different nature, both internal and external to the organization, in the design and in the implementation of the current experiments, showing the highest compliance at this level of the model. Ghent focused mainly on the relationship with a main external partner (Proximus) while trying to involve other actors in the data exploration path. Pilsen tested the effectiveness of the three tools through the collection of feedback in open group testing, thus adopting a vision of co-creation based on the update of already designed technical tools according to the response of the users.

The evaluation for each pilot can be done by establishing a scale of compliance with the policy making model (low, medium, high). This assessment can be done either in a disaggregated way, i.e. considering the three levels separately, or in an aggregate way, to obtain a synthetic value that qualifies each pilot.

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, in fact, prescribes behaviours to be adopted to better exploit data-related opportunities. However, for these activities to take place, it is necessary to consider the potential resistance of the political culture of each context. 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 iteration

Following the first 3 iterations, the final iteration of the project will be a final demonstrator with all the tools developed by the project, allowing to show how these can have a real impact in use of data for policy making.

To this end, the three original pilots of the project have been working on a final evaluation scenario. Those scenarios take into consideration all the due amendments related to the lessons learnt of the previous cycles and it will make possible to have a final validation about the use of data, on the various use cases, in policy making.

Moreover, this final phase will propose a real training to users, provided by project partners and based on project findings and solutions, but particularly demonstrations of the tools to potential real users to propose to use the PoliVisu toolkit to replicate one or more solutions.

To this end, the cycle will be mainly conducted on an open audience composed of potential users, allowing pilots to have feedbacks about:

- *Usefulness of tools/visualisations on policy making;*

- *commercial value/transferability* of the tools and visualisations;
- *Identify potential adopters* of the solutions.

It has to be noticed that Flanders pilot will have a participation in the evaluation of this phase, but a limited role, due to the external support of the involved public authorities. To this end, Flanders will have a small scenario that will be built later during spring 2020.

Finally, training activities will be conducted with a dedicated evaluation as reported in a dedicated document[23]. The evaluation methodology applied will be in the framework of the Evaluation plan of the project (see section 4.4 for more information).

4.1 Ghent: the final evaluation scenario

The City of Ghent, more precisely the office for data & information, will be scenario owner. The office for data and information is a central entity that offers support and expertise to the organisation to gather, manage and analyse data. Data availability is the main issue for this pilot and that is the reason why the office for data and information is responsible.

The main objective is to design policy about the use of hidden population of students. Ghent is a student city and a great part of these students stay in Ghent during the week. It is clear that students have an impact on the city and should be taken into account by policy makers. This affects different domains such as the economy, the housing market, mobility. However, there is no data or information available about where residential students in Ghent reside. The available administrative data sources do not suffice to solve this problem, therefore alternative, sources of data are explored (mobile phone data, sensor data, social media data). The data that will be obtained is useful for many different departments, the civil services of habitation and education are the most logical ones, but once the data has been obtained other departments might benefit too.

In this context, the specific objectives are:

- To obtain relevant data for the policy problem, the unknown location of student residencies;
- To provide self-service visualisation tools for policy makers to allow them to gather the due information. Many different city departments are involved when questions about the student population are concerned. Every department should be able to solve their question themselves based on the tools provided;
- To provide competencies and organisational processes to support policy makers (stimulate data-driven decision culture).

The achievement of these objectives is supposed to generate the following outcomes:

- increase of data concerning the housing location of students, that is ready to be used for policy making. Different data sources (wifi sniffing, social media data, mobile phone data) were explored to this end;
- The data should be available through self-service tools which are easy to be used by the policy makers;
- Definition of representativeness of data for the population. It is not possible to obtain data that indicates for every residential student where they live. Various explorations were made from various data sources but representativeness poses different challenges here:

[23] D8.8 PoliVisu Training Module

  - 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?
- Increase of the awareness within the public administration about the use of data for policy making. This is partly achieved since it became one of the long term goals of the government of Ghent to have more data-driven 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. it is noticed that more departments and offices know about the office for data and information and reach out for aid. This requires investing in a more mature data and information management for the city administration.

In this framework, to achieve the results highlighted above, various participants to the activities have been identified:

- The office for data and information is the cell within the public administration that holds the necessary expertise when data is concerned.
- The IT partner of the public administration is involved for their expertise in data storage and deployment of tools.
- Other civil servants, such as the department for education and the department for habitation, are involved for their specific expertise related to the content of the policy problem: student behaviour, housing market and student habitation.
- The policy makers that are involved in the policy problem, the mayor and deputy mayors.
- Proximus, the telecom provider that provides the relevant data and part of the data analysis. The institutions for higher education, as they have a specific interest in the results as well.
- The students themselves.

Mainly, Ghent wants the users to use the data to visualise data in order to base decisions/conclusions on. More particularly, the objective is to involve users to have the intention to obtain relevant data for the policy problem and the policymakers to be aware of the value of data and visualisations. Moreover, the users should gain skills and employ organisational processes that are necessary for data driven policy making.

Table 9 Success criteria of Ghent evaluation scenario

KPI	Expected
APPLICATION	
Acceptance of the model	Full
Usability of the data	Full
Number of expert lens interviews	5
DATA	

KPI	Expected
Number of possible datasets explored	7
USE	
Number of stakeholders collaborating	23
Number of policies explored	5
Number of policy decisions	2
Number of cities contacted	43
TRAINING	
Number of training events	2
Number of people trained	47
Satisfaction of trainers	100%
Satisfaction of trainees	100%
Increased understanding of trainees	100%

4.2 Pilsen: the final evaluation scenario

The scenario owner is the City administration of Pilsen, particularly the traffic department with the support of SITmP.

The objective of Pilsen is to improve the traffic situation, by means of less congestion due to the number of road closures, with responsible roadworks planning. By involving big datasets (traffic sensors) into decision-making processes and enabling online modeling, the quality of decisions made will be improved. The relevant organizational units of the city and others must be involved in this process. Outputs must be visible and understandable to the public. This corresponds to the PoliVisu project efforts.

Planned output will be the application and setting of the process (adjustment of the decision-making process), which enables inserting traffic closures and online traffic modeling.

The developed application should offer a more user-friendly environment (easier, faster and more interactive) for testing traffic restriction than previous solutions in the city.

The KPIs defined have been:

- number of policy decisions made based on the Traffic Modeller tool and related workflow usage;
- number of users (organizations) using Traffic Modeller for inserting traffic measures.

Ideally, the SUMP will fully implement Traffic Modeller for evaluation/test of its measures and actions, making it fully used in a policymaking cycle. This should drive to:

- collect the road closures - once the application is ready and the traffic model is continuously updated, it is necessary to ensure the insertion of traffic restrictions by involving the Investment and Traffic department of the city, Superdio manager and external organisations (e.g. regional traffic authority);
- model and compare - not only overlapping closures, but in long term also new planned roads, bridges, etc. Superdio manager, Traffic department and City urban planning department needs to be involved. These organisations will model, prepare outputs and evaluate impacts (short/long term).
- Publishing predicted traffic situations or variants of possible traffic solutions to public surveys and to policy makers.
- using visualizations and prepared outputs in policy making processes. Decision makers will accept measures with evaluated impact. Traffic engineers will evaluate SUMP measures accepted earlier and will recommend new traffic solutions.

To achieve these results, it is necessary to involve different stakeholders, particularly:

- traffic department, in particularly the staff in charge of “permits closures and traffic constructions”;
- Superdio managers, in charge to collect planned closures and assesses the conditions (duration, term shift) for their implementation;
- infrastructure managers/utility provider, in charge to provide information about their constructions requiring restrictions in traffic;
- traffic modelers/urban planners, in charge to model and to assess the behavior of traffic in the city, to test and to verify the impact of proposed / implemented traffic measures. Proposals for modifying and maintaining the traffic model should also be their responsibility.

The recruitment is planned to be executed through:

- political support, as this effort is in line with the political statement of the city management and at the same time politicians have expressed support for this project, we assume that they will push the use of developed support tools in the city's decision-making processes. Especially at the workplace of the Superdio manager, the Traffic department and Urban Planning.
- Presentations, as all developed tools will be presented to the city representatives and the public. It will be presented in workshops as well as in the media. Emphasis will be placed on their contribution to improving decision-making processes.
- Training, as an integral part of putting the developed tools into practice is training their operation and understanding the principles. Moreover, the training materials, presentations and videos, are prepared for the training participants.
- publishing, as the results of the use of new tools will be showcased to underline the potential impacts to both the city and the public.

This process should allow to achieve:

- less congestion, fluent traffic circulation - the main benefit should be the situation in which the closures that are subsequently affected and accumulate the impact on the absorption are not allowed. The number of closures should decrease by 10% mainly due to their coordination. Another criterion is the duration of traffic congestions - whether we are talking about peak hours of the day and those that are caused by closures. A 5-10% reduction will be a good result.

- Evaluated road closure impact, the number of modeled impacts of the closure and subsequent verification will, in concrete, help to understand the traffic behavior in Pilsen and it will improve the experience with their permitting, postponing, merging, coordination. This should be considered for any major closures, estimated in about 20 - 30 per year.
- Use of data modelling tools for policy decisions, in particular about the long-term measures introduced in the SUMP. New instruments and their outcomes can be an impulse to propose new measures and assess their effectiveness. The number of measures that had a positive effect on traffic will also be measurable.

The project evaluation will be managed from different channels - surveys, big data used, interviews, workshops, feedback from app, comparison of modelling and real situation. The table below summarizes the success criteria of this project.

Table 10. Success criteria of Pilsen evaluation scenario

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

KPI	Expected
Nr. of published outputs/variants	5 per year
Nr. of datasets in DCAT	3
USE	
Nr. of city users	6
Nr. of public uses (Google analytics) - presented results	500 per month[24]
Nr. of city uses (Google analytics) - inserting closures, modelling	30 per month
TRAINING	
Nr. of trainers	2
Nr. of trained users	5
Nr. of training events	2

4.3 Issy: the final evaluation scenario

The scenario owner is the City of Issy-les-Moulineaux, particularly the departments of public spaces and smart city, being today active to define smart solutions to make data more and more used in the decision-making process. In this scenario, Issy Média, representing the communication department of the City, has an active role in the definition of communication policies, also the ones strictly related to mobility.

Being the City of Issy-les-Moulineaux in the outskirts of Paris and representing one of the most important digital districts of the region, it experiences car congestion, particularly in peak hours, due to its economic vitality and the transit of vehicles moving from the region to Paris. Moreover, the statistics on use of cars of the residents[25] show how those are not particularly involved in this trend as just 27% of the active people go to work by car.

In this context, the City of Issy-les-Moulineaux, as many other Cities of region, is experiencing a high number of roadworks due to an important project to build or reinforce various metro lines to better connect all the cities outside of the City rings between each other and with the various airports and train stations. Those roadworks will have an impact for various years. Moreover, the City of Issy, as it is attracting more and more companies (ex. Orange, Nestlé) and inhabitants[26], is also impacted by various real estate projects, having also an impact on new flows of people.

[24] The two rows of the table refer to "Traffic Modeller":
- public part of Traffic Modeller and
- non-public - experimenting part of app.

[25] Census “INSEE” 2016 (NB improve this note)

[26] The population was about 45.000 people in the early 90’s and it is today about 70.000 (source: INSEE)

Consequently, the City has today a double need that cannot be managed with the "classical" tools:

- to monitor the traffic to understand how those roadworks and new buildings impact public spaces occupancy and behaviours;
- to communicate to a population that is not limited to the residents, being the most of car users not living in Issy.

Moreover, the City, as any other, has to deal with a distribution of the traffic that is often defined by the various mobility applications (such as Google Maps, Mappy, Citymapper…) that are algorithm based and often do not take into consideration events or incidents that need to be taken into consideration. The idea of the City is, even if those tools have a real potential advantage and usefulness, to assure that the City can be part of the process of the traffic distribution.

To this end, the City has the need to define tools that might be useful to monitor the situation and the impact of roadworks and, at the same time, it can work on urgent communications with drivers. This strategy also has the need to find solutions, not just to reduce congestion, but also to improve behaviours, i.e. the number of cars on road, at least in peak hours.

It is then necessary to improve the use of data, working on tools and defining a good strategy, but this needs to be implemented through pilots and to be evaluated. The City has then defined two different tools with a strict correlation between them:

- a dashboard with traffic historical data[27] (obtained from BeMobile) to allow to study hot points and the evolution of traffic after the start of roadworks, making possible to understand which are the most difficult zones and periods;
- an application, Myanatol, allowing to combine Google Map algorithms, information and local tips from the City and artificial intelligence to make it simpler to move. The application, on a particular segment, re-routes users on two different options studied by the start-up managing it and the City, according to various data, using, on request of the City, the same calculations and processes used by the dashboard, to allow to understand how the use of data in that format may have positive impact in defining re-routing with a positive impact on congestion.

Ideally, the participants will have to use the dashboard, or a similar product, to obtain insight from traffic data, usually complex and uneasy to be used by non-technical users, to identify the segments that experience the worst situation about traffic and to identify the potential alternatives to define a re-routing for drivers to be implemented in MyAnatol. It has to be noticed that this a pilot on mobility, but the City's main goal is to achieve the knowledge and know-how to define more dashboards later, for policymaking, also in other fields.

The expected participants will be then divided in 2 big groups:

- civil servants, having an active role in mobility and data
- citizens "drivers"
- providers of the data and the services

If data and services providers and civil servants have already been identified and selected thanks to the work conducted in the previous iterations, citizens are today recruited with a street marketing operation, allowing

[27] October 1, 2017 to October 1, 2018 of the whole Paris Region

to involve the ones that are actually impacted by daily commuting by car in the zones that have been defined as more complicated with the use of data.

Being this a pilot, it is not considered possible to achieve in the short term a big reduction of congestion, but some KPIs have been 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 visualisations and open data;
- 10 civil servants interviewed.

The preparation of this activity has lasted for about 2 years, since the early beginning of 2018 with activities mainly addressed to:

- identify and involve users (civil servants);
- identify useful data and related data providers;
- identify and involve local start-ups to provide data services.

These activities have been successful with the involvement of civil servants (about 10 of the City of Issy-les-Moulineaux and the urban agglomeration Grand Paris Seine Ouest (including policy/decision makers), 1 company (BeMobile) and 1 start-up (MyAnatol).

The pilot is now deployed to evaluate the potential use as described above to allow to define:

- usefulness and usability of tools;
- usefulness and usability of the model;
- impact on readiness in use of the data of civil servants and policymaking.

Table 11. Success criteria of Issy-les-Moulineaux evaluation scenario

KPI	Expected
APPLICATIONS	
Acceptance to improve behaviour	+1%
Usefulness of dashboard	10 users

KPI	Expected
Usefulness of MyAnatol (sessions)	10 000
Usability of dashboard (interviews)	80%
Usability of MyAnatol (users accepting deviations)	150
POLICY MAKING	
Acceptance of policy making model	Full
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
TRAINING	
Nr. of trainers	2
Nr. of trained users	10
Nr. of training events	2

4.4 Training and exploitation: the evaluation

The training module is created to impact stakeholders' knowledge, skills and attitudes on the use of big data visualisations for better policy making. To know whether this objective has been met, it is important to collect evidence on whether the intended target audience was reached, whether a training module in whole or in part has made a difference to users in their work, life or study, and whether learning material and the adopted formats engaged participants well enough to create a long-lasting relationship with the project and object of study. The best way to measure achievements or under achievements is to create separate KPIs for each of the training module components: online course, webinars, workshops. Outcomes can then be evaluated against set targets using different data collection tools and techniques e.g. before/after questionnaires, view/download count, registration numbers, enrolment/completion ratio.

Online course: A range of KPIs has been developed to capture participant background, participation, achievement, quality. Some KPIs will be assessed using surveys, others through the MOOC platform (OpenLearn Create). A few are covered by both.

Table 12. Online course KPIs

Focus area	Indicator	Means of Verification	Platform	Survey
Participant background	User demographics	Gender, age	X	X
	Social status	Education, employment etc.	X	X
	Geographic location	Location tracking	X	X
Participation	Engagement	Registrations, views, clicks, completions etc.	X	
	Collaboration	Interaction on forum, with other users etc.	X	
	Retention	% learners involved after several weeks	X	
Achievement	Certification	% learners acquiring certificates	X	
	Assessment results	Average assessment score	X	
Quality	Web interface	User rating on accessibility, usability		X
	Content material	User rating on accessibility, usability		X
	Instructor support	User rating on extent and quality of support		X
	Relevance	User rating on usefulness, effectiveness		X

The actual KPIs will be decided by the course development team and the project evaluation team during content creation and communication plan building.

Webinars: They provide a direct opportunity to connect with potential adopters, share key insights and continue the conversation long after the event has finished. Because webinar software can be expensive (fees in excess of €1,000 per annum for a basic package are not uncommon), it is important that webinars deliver good value for money. To measure progress, impact and return on investment, we propose the following 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. A low number of registered attendees could be caused by many different factors. Promotion strategy is the first thing that needs to be checked in that case. Also, using the registration form we can collect, in compliance with the GDPR, information that can be used to make contact with people in the future, especially if they fail to attend the event.

- *Attendance:* Attendance is related to impact but only partially. One could argue that the more people attend, the greater the impact. However, people can join a live event but focus on something else while the session continues to run in the background. Alternatively, they can fully immerse themselves in the webinar only to discover that its structure is confusing, content irrelevant and speaker boring. For these reasons, attendance cannot be used as a true measure of success. But it can still be useful. For instance, attendance can be used to calculate a conversion rate i.e. the number of people who joined a webinar compared to the number of those who had registered.
- *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. One should remember though that some people are introverts and may not be so eager to jump into a discussion. To ensure the widest possible participation, the hosts will need to let everyone know at the outset which features are available for people to express themselves e.g. chat, Q&A, 'raise hand.'
- *Feedback:* The best way to measure webinar's success is to ask the audience directly after the event. This can be done using short, multiple choice surveys. Examples of questions that can be asked
    - How did you find out about this webinar?
    - What, if anything, did you like about today's webinar?
    - If you could improve anything, what would it be?
    - How likely are you to recommend this webinar to a friend or colleague?
    - We are planning to run more webinars like this in the future. Would you like to attend?
    - Please list up to three new things that you learned today.
    - What other subjects are you interested in?

Workshops: The KPIs for workshops will be similar to those used for webinars. We will be closely monitoring the registration numbers to see if any adjustment to the comms plan is needed. We will compare attendance with registrations to work out the conversion rate. Due to the different nature of two activities, it is not possible to apply webinar's participation metrics to workshops. Nevertheless, we will ask workshop attendees about their experience at the actual event using a short paper-based questionnaire. Through the evaluation, we would like to explore potential impact in three areas:

- *Design and structure:* Measuring the usefulness of carried out activities, groups' size, overall pace
    - Was the workshop engaging?
    - Was the workshop well-structured?
    - Did the workshop proceed at a reasonable pace i.e. not too fast, not too slow?
- *Learning:* Measuring the impetus to discover new ideas, see things in a different light, share and learn from others
    - Did you learn something new/useful/important?
    - Did the workshop challenge you to think creatively i.e. outside the box?

- Did the workshop provide an opportunity to interact with others?

- *Behaviour:* Measuring intention to use PoliVisu for work or study, share it with others, receive updates
  - Would you use PoliVisu Toolbox in the future?
  - How likely are you to recommend PoliVisu to your colleague/friend?
  - Are you interested in completing the PoliVisu online course or joining one of its webinars?

5. Conclusion

Up to the end of the third iteration, PoliVisu has applied its formative and summative evaluations with good results, although some barriers were met, but the increasing strategy and the risk management allowed to find solutions to improve the strategy over time.

The experience of pilots is showing a good readiness of Cities and public authorities in use of data to improve the policy making process, although various bottlenecks keep making difficult to fully implement those processes. On this side, from an evaluation point of view, the biggest barrier met was mainly methodological as the experience of the project showed that a quantitative evaluation of tools and the policy making model is not possible, due to the number of different tools (associated normally also to various uses) and the nature itself of the model. The project reacted to this with a plan to have a more qualitative evaluation that can be associated to levels of compliance, instead of a pure quantitative evaluation.

The known bottlenecks have been confirmed, making clear that some actions are still necessary, at a general level, to make useful the use of data:

The known bottlenecks have been

- Limitations related to data ownership can have an impact on evaluation processes and full adoption of tools/solutions. This is the case of Ghent and Issy, which had to request data from private bodies. In the first case, data is not open, not allowing Ghent to make a large scale pilot, while in the second case, data has limitations in use (it cannot be shared with third parties outside PoliVisu) and in its content (one year and on a limited number of cars), making the related tool having some limitations in use and not allowing a full adoption for a policymaking process.
- Authorities/jurisdiction have an impact on data and the usefulness of applications. If on one side, this makes the data more dispersed, on the other, with more important consequences, this makes the tools potentially limited in use. This has also the consequence to often request *ad hoc* tools/visualisations, making necessary huge efforts and budgets for a City or a public authority.
- Personal data can represent a bottleneck, making necessary to take actions in a due manner and it requests high-level skills to anonymize data, this was noticed particularly in Flanders and Ghent, due to the nature of the data captured and/or used.

This allows to say how the model is fully accepted by the pilots, although this will be further investigated during the last iteration, through a final evaluation scenario that has been built by all pilots.

Moreover, during the latest iteration, the project has kept working on its expected KPIs mainly meeting them and proposing an effective planning for the next iteration to meet the expected results. On this side, it was clearly possible to start with real open activities, increasing the number of participants, becoming more than 700, and starting real evaluation of the policy making cycles. It has to be noticed how the use of various tools complicates the adoption of a dedicated KPI for the acceptance of use, as it is not effective to use an average

of the different tools. Consequently, it becomes necessary to have a more qualitative evaluation to detect the real impact that those have.

The project is now ready to move to the final iteration with a good base as it can now rely on those achievements, particularly on:

- About 750 representatives of external stakeholders supporting the project;
- Policymakers of 5 pilots fully involved in the project;
- A better knowledge on use of data and tools on policy making;
- An evaluation scenarios per pilot;
- An increased visibility of the project also outside the pilots' cities;
- An improved working toolbox to be showcased;
- 9 fully working apps in all pilots;
- About 12 policy decisions explored and 1 fully adopted (Pilsen);
- Online training modules were built in the form of a free online course (MOOC) and webinars.

Furthermore, during this iteration, the framework and the plan for the training activities that will take place during the last phase of the project, were created to make possible to have a final evaluation with a clear view of potential success of the pilots and, consequently, the project.

Finally, it should be noted that **due to the impact of COVID-19, some workshops may not go ahead as planned.** The team is closely monitoring the situation and will adjust its strategy according to the public health advice given by local, national and international public bodies and agencies. On this side, at the time of the writing of this report, the most of national authorities have applied strict social distancing measures, including strong limitations on travel[28], that would have consequences for the ongoing plan if those will have a longer period duration.

[28] In most of European countries, citizens are not allowed to leave their home if not for urgent matters.