



IDF_06 : Observatory of mobility for Versailles agglomeration

Description of the measure and main outcomes expected

Measure IDF_06 aims to create a mobility observatory for elected officials and transport stakeholders for Versailles and the 18 municipalities of its conurbation. This involves creating a platform that collects, aggregates and returns all information relating and inherent to mobility to users of the platform.

The objective is to provide elected officials with clear information on the uses of mobility in the urban area in order to make decisions and put in place appropriate infrastructure and enable decision-making based on facts rather than opinions.

Preparation of the measure

Identification of data sources and user experience

A first phase allowed us to identify the main aspects of the technical and functional architecture of the observatory platform. Through several work sessions common between VGP and Redlab, we were able to highlight and identify the data as well as the philosophy of the observatory :

The tool must make it possible to collect information from numerous data sources in real time.

Each data source must highlight different indicators relevant to elected officials.

The indicators may be of different nature (graph, cartography, charts, etc.)

Different tabs will allow information to be grouped by category (Traffic, Air quality, etc.)

The frequency of updating and availability of data are key factor success for the success of the observatory.

The tool must allow consultation of data in real time as well as in the medium-long term to analyse trends and developments.

VGP must have the possibility to customize the restitution of data to identify correlations between data sources.

The observatory must offer a catalog of widgets allowing data to be rendered in different forms.

The tool must be agnostic of VGP and its environment to allow deployment in other pilot cities of the UPPER project.

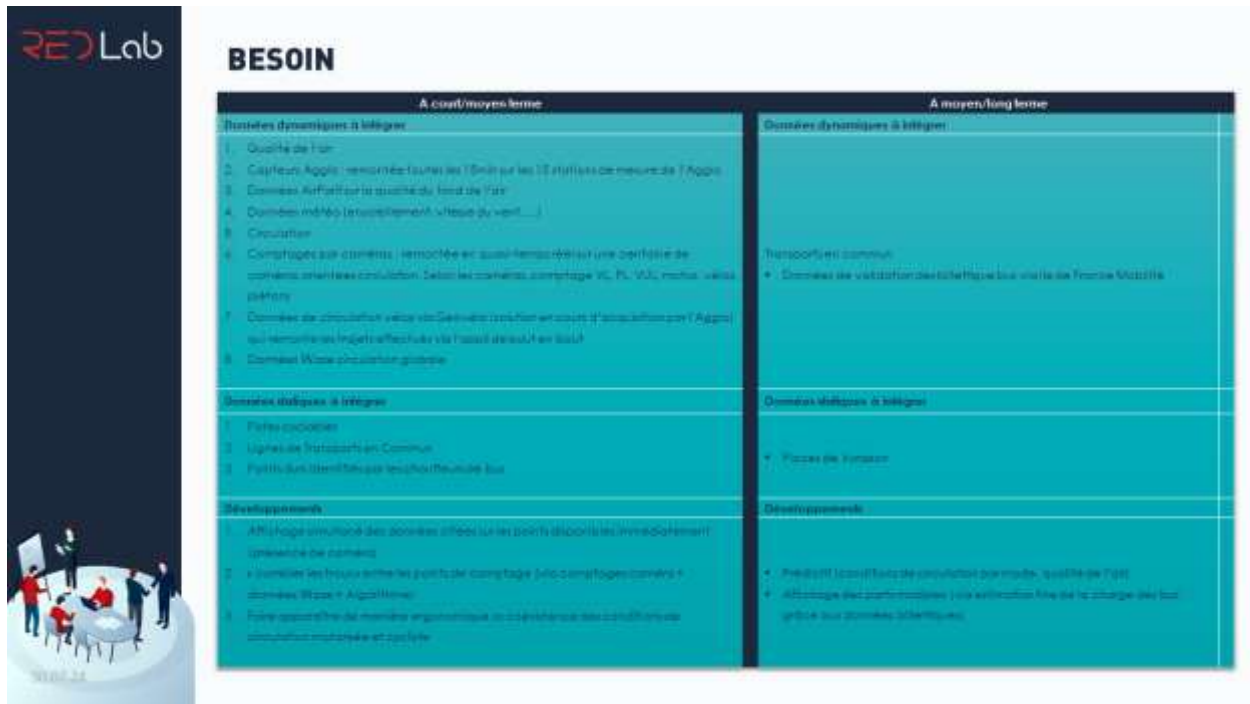


Figure 1 : Identification and prioritization of data sources and needs for Versailles

Technical specifications and architecture

The solution is based on Docker and is composed of different development modules.

Centralized database : It stores all the information extracted from external data sources. The database contains all the reference information (municipalities, counting points, etc.) as well as the data relating to the indicators.

ETL (Python) : They are responsible for extracting, transforming and loading data from external sources (Waze, VGP Data lake, External Partners) to the central database

Backend (Java): This is the engine for calculating and processing information

Frontend (React): It allows the display of information and user interactions.

I Technical standpoint

Layered architecture to allow replicability and roll out to all cities :

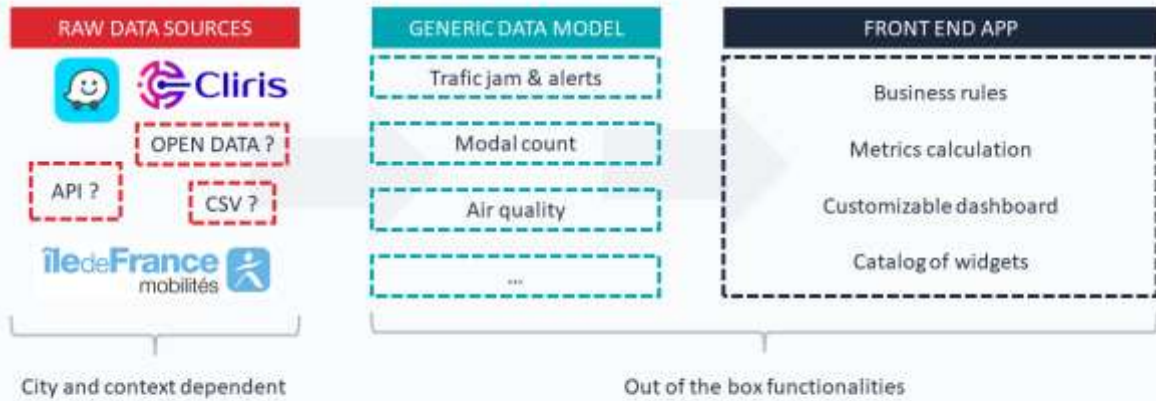


Figure 2: Technical architecture (Macro)

Functionnal specifications and printscreens

Figures 26, 27, 28, 29 and 30 below, illustrate the first developments carried out and the provision of data sources (Waze, Air quality analysis station, Cycle paths, Identification of counting flows by AI-boosted camera, Weather report and ETL scheduling).

I Take a look

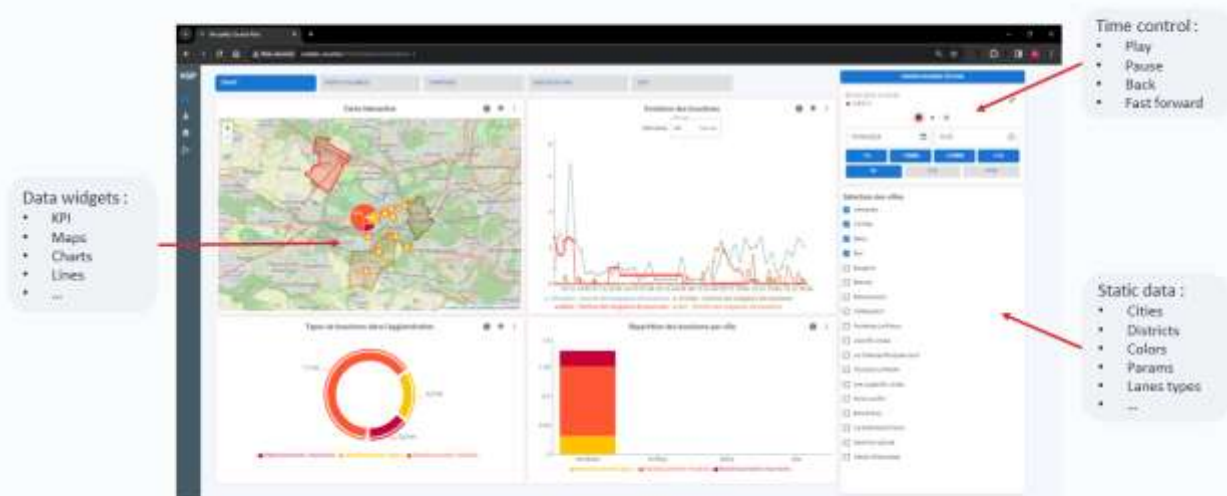


Figure 3 : Traffic jam and alerts in real time

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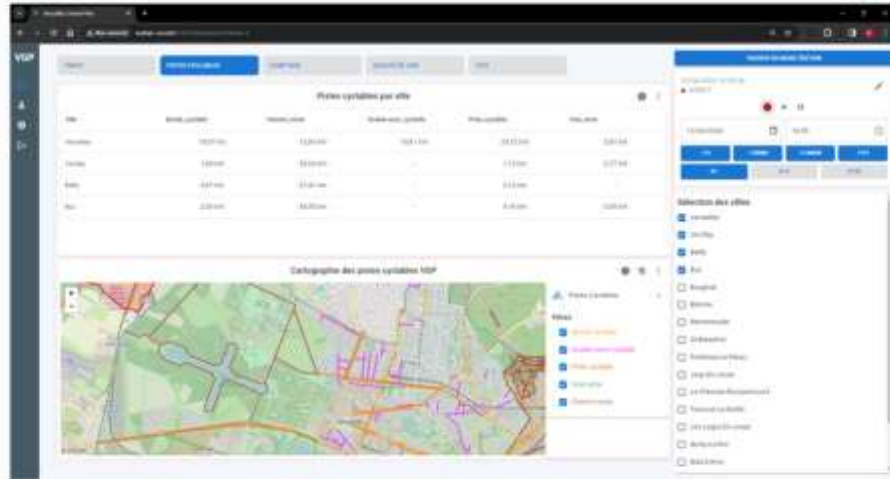


Figure 4 : Bicycle path

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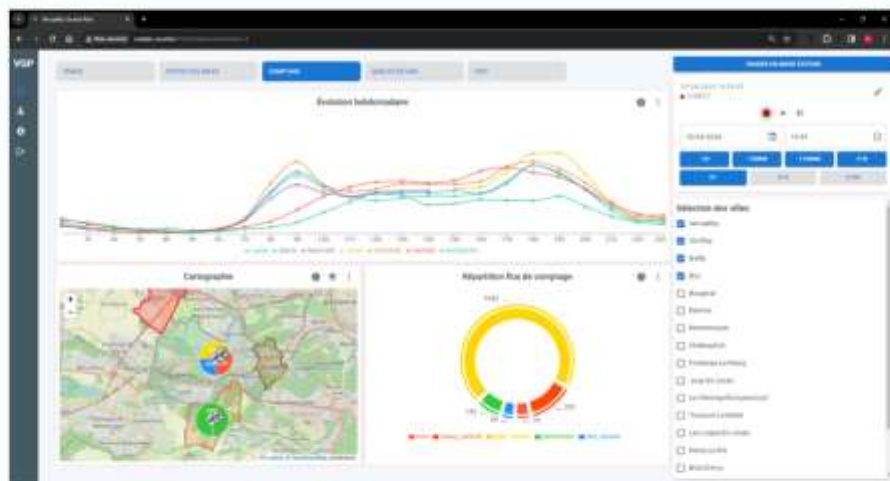
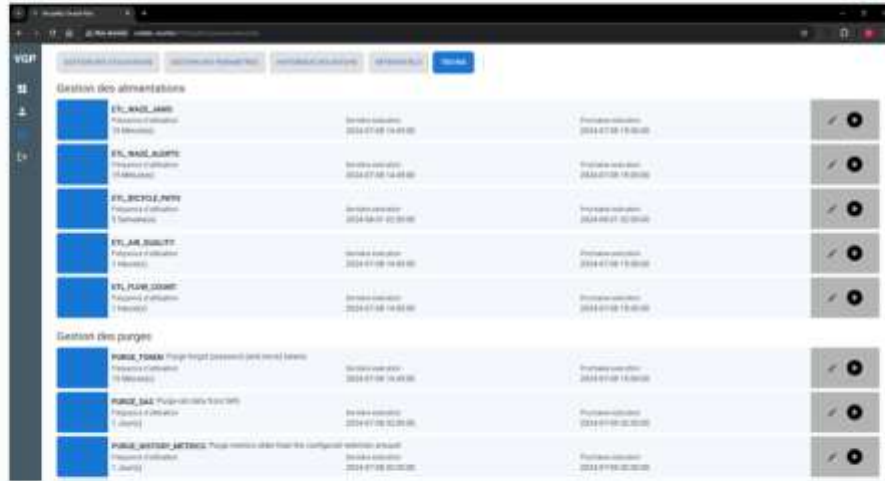


Figure 5 : Cameras and AI accounting for mobility types

I Take a look

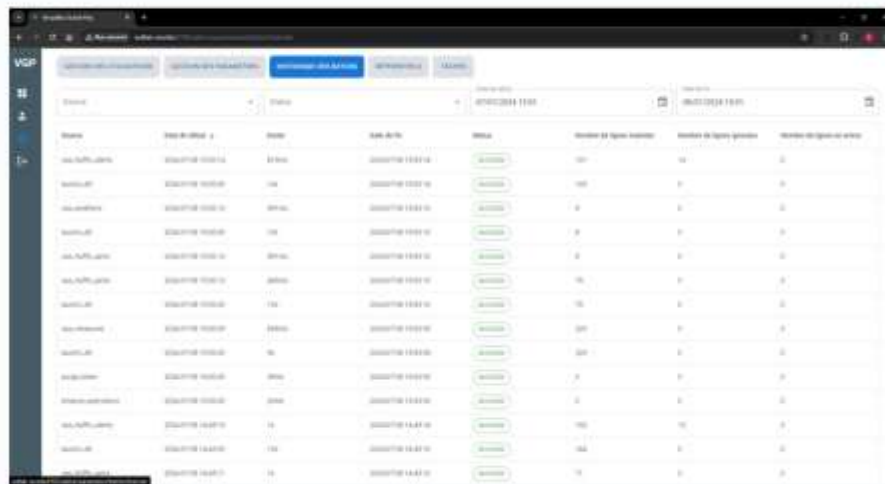


| Job Name | Frequency | Start Date | End Date | Status | Actions |
|------------------|---------------------------------------|---------------------|--|--------|---------|
| ETL_BAILLAGE | Fréquence d'alimentation (10 minutes) | 2024-07-08 14:45:00 | Prochaine exécution: 2024-07-08 15:00:00 | ✓ | ⊙ |
| ETL_BAILLAGE_PTS | Fréquence d'alimentation (10 minutes) | 2024-07-08 14:45:00 | Prochaine exécution: 2024-07-08 15:00:00 | ✓ | ⊙ |
| ETL_BICOLE_NWY | Fréquence d'alimentation (10 minutes) | 2024-08-01 00:00:00 | Prochaine exécution: 2024-08-01 00:00:00 | ✓ | ⊙ |
| ETL_AIR_QUALITY | Fréquence d'alimentation (10 minutes) | 2024-07-08 14:45:00 | Prochaine exécution: 2024-07-08 15:00:00 | ✓ | ⊙ |
| ETL_PUMP_USAGE | Fréquence d'alimentation (10 minutes) | 2024-07-08 14:45:00 | Prochaine exécution: 2024-07-08 15:00:00 | ✓ | ⊙ |



Figure 6 : ETL Scheduling and settings

I Take a look



| Worker | Statut | Statut | Statut | Statut | Statut | Statut | Statut |
|-----------|--------|--------|--------|--------|--------|--------|--------|
| Worker 1 | Actif | Actif | Actif | Actif | Actif | Actif | Actif |
| Worker 2 | Actif | Actif | Actif | Actif | Actif | Actif | Actif |
| Worker 3 | Actif | Actif | Actif | Actif | Actif | Actif | Actif |
| Worker 4 | Actif | Actif | Actif | Actif | Actif | Actif | Actif |
| Worker 5 | Actif | Actif | Actif | Actif | Actif | Actif | Actif |
| Worker 6 | Actif | Actif | Actif | Actif | Actif | Actif | Actif |
| Worker 7 | Actif | Actif | Actif | Actif | Actif | Actif | Actif |
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| Worker 10 | Actif | Actif | Actif | Actif | Actif | Actif | Actif |
| Worker 11 | Actif | Actif | Actif | Actif | Actif | Actif | Actif |
| Worker 12 | Actif | Actif | Actif | Actif | Actif | Actif | Actif |
| Worker 13 | Actif | Actif | Actif | Actif | Actif | Actif | Actif |
| Worker 14 | Actif | Actif | Actif | Actif | Actif | Actif | Actif |
| Worker 15 | Actif | Actif | Actif | Actif | Actif | Actif | Actif |



Figure 7 : Global view of workers activities

Challenges & Mitigations

The main technical difficulties are that the data sources are heterogeneous, refreshed at different frequencies and in various formats. We must keep in mind the idea of building an agnostic model of



Versailles to create a real platform reusable in other contexts for UPPER. That implies the construction of an open data model which required several redesigns before being fully operational.

Beyond the technical difficulty, the availability of raw data remains the main challenge of the project. The design and ideation phase is relatively simple but it relies on the fact that the data will be available. The major difficulty we encounter here is being able to access data sometimes held by private organizations and who do not wish to make it available to Versailles.

Next steps towards implementation

The observatory's roadmap contains various major subjects such as the ability to aggregate information to study long-term trends. Initially we had envisaged the observatory as a platform which consolidates data over 3 to 4 weeks. This challenge having been accomplished, we have opened up the use to retention and a broader vision of the data.

The tool must provide an answer to this question “What was the impact of implementing this measure?” This information can only be assessed in the long term and we wish to offer the possibility to aggregate data over periods of time (days, weeks, months, years, etc.) to observe developments and trends.

In the meantime, we continue to feed the observatory with new data sources and test the limits of this agnostic model.