SIDERA Analytics: The Big Data and AI platform for mobility planning

Capital Digital

01.

The project in the framework of the Digital Transformation Strategy

Madrid, Digital Capital

The Project and Madrid, Digital Capital

Framed in **the Digital Transformation Strategy of the Madrid City Council.**

Strategic Objective 2. **City Intelligence**

Safe, resilient and empowered city

Programme 5. **Digital and sustainable intelligence in management**

Capital Digital | MADRID

Estrategia de
Transformación
Digital de la Ciudad
de Madrid

*Porque lo Digital
es Capital*

*Madrid,
Capital Digital*

02.

Transition to New Mobility Analysis Technologies

Traffic flow surveys in the city of Madrid.

- The Madrid City Council has historically recorded the traffic on the city's most important streets.

- Traditionally, mechanical counters have been used for this task.

- High cost and human effort, spot measurements.

New mobility analytics technologies

AI-POWERED VIDEO ANALYSIS

TELEPHONY-BASED MOBILITY DATA

DATA GENERATED BY FLOATING CAR DATA (FCD)

AI video analytics

- Advances in Artificial Intelligence (AI) have also reached traffic surveys.

- To the traditional counting, modal differentiation is added, including soft modes such as pedestrians and bicycles and the study of their trajectories.

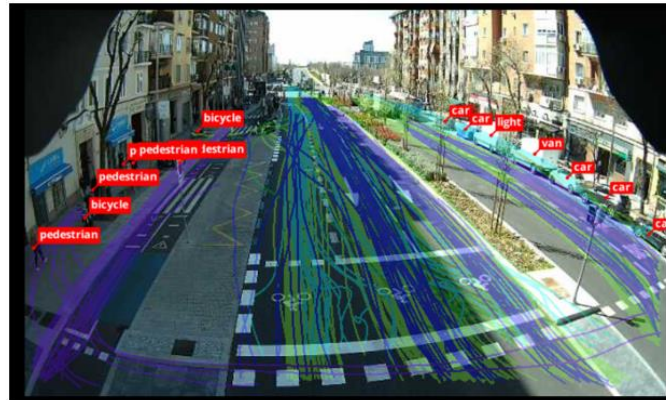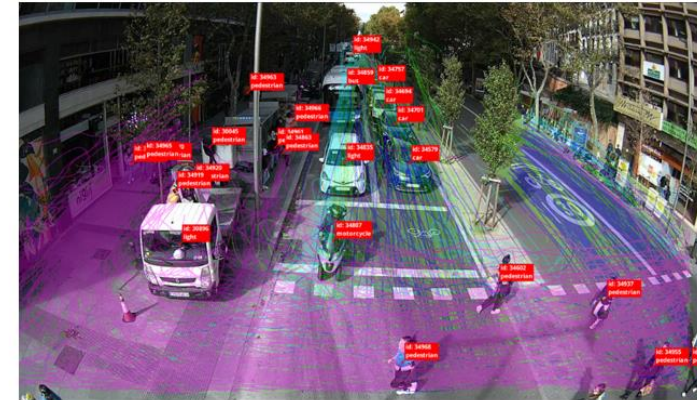- Network of survey stations and point measurements.
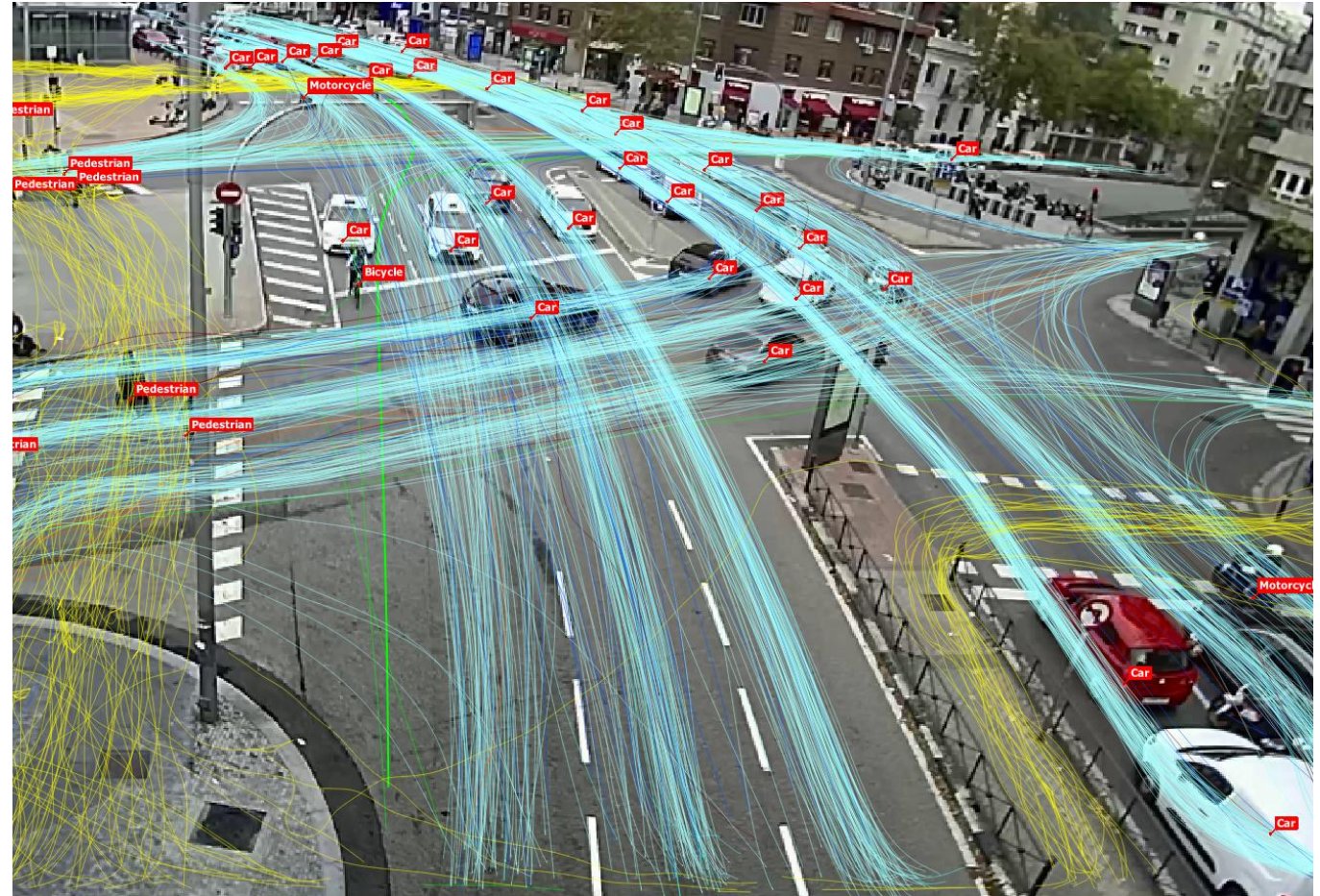
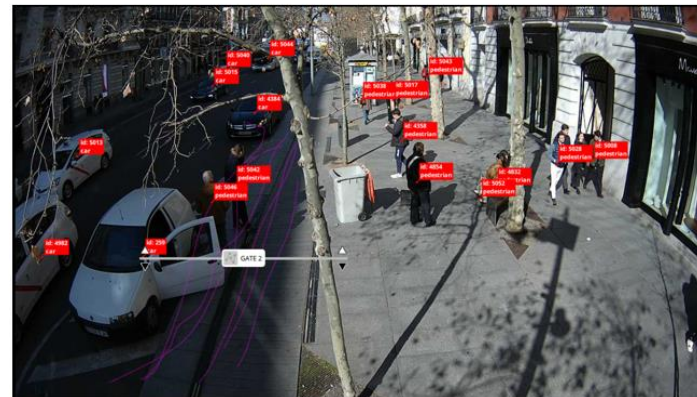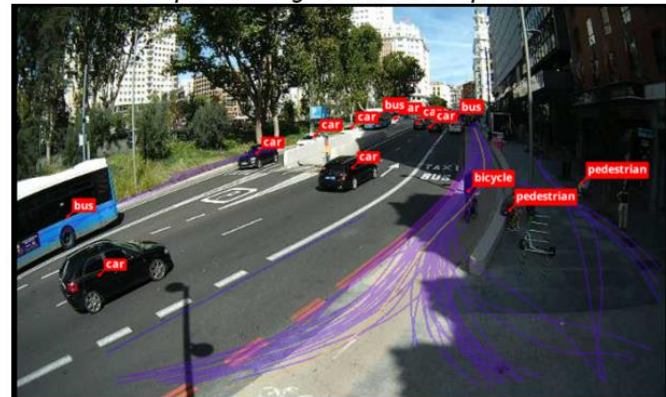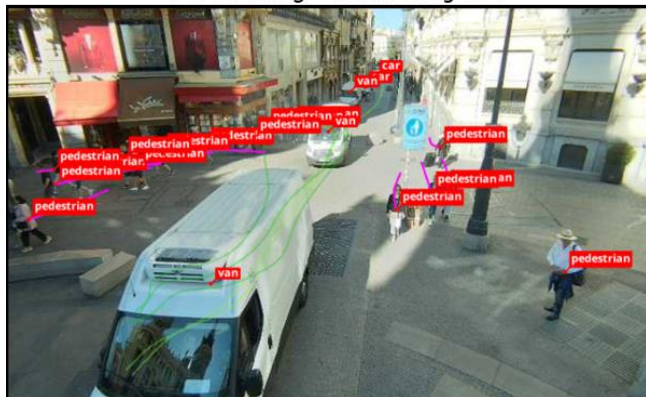# Network of vehicle, bicycle and pedestrian gauging stations.

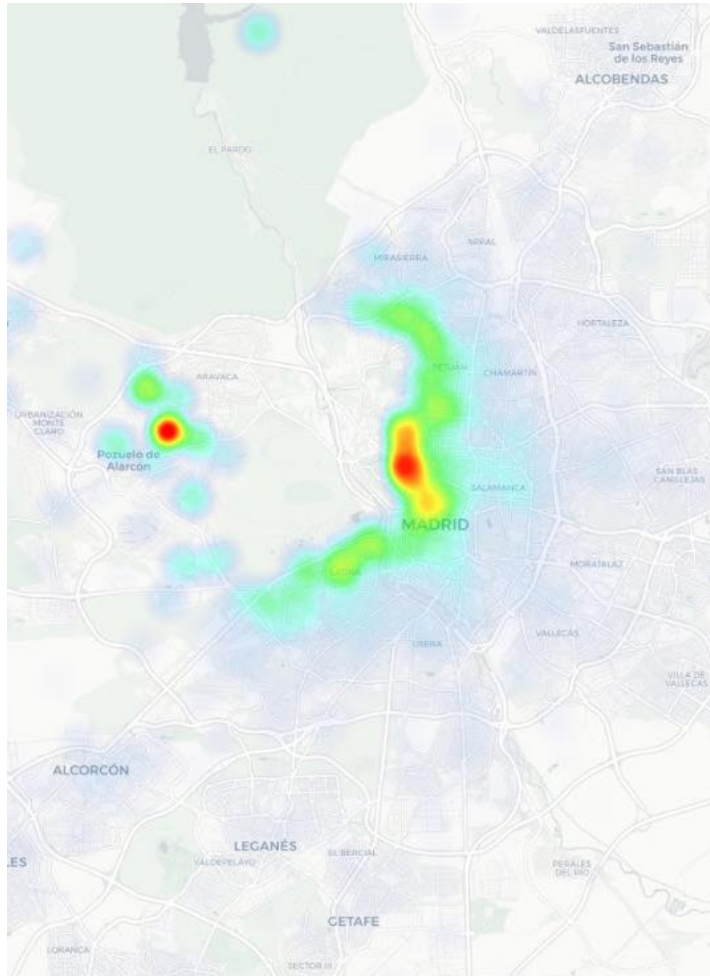Estaciones de aforo peatonal. Calle Arenal y Canalejas.

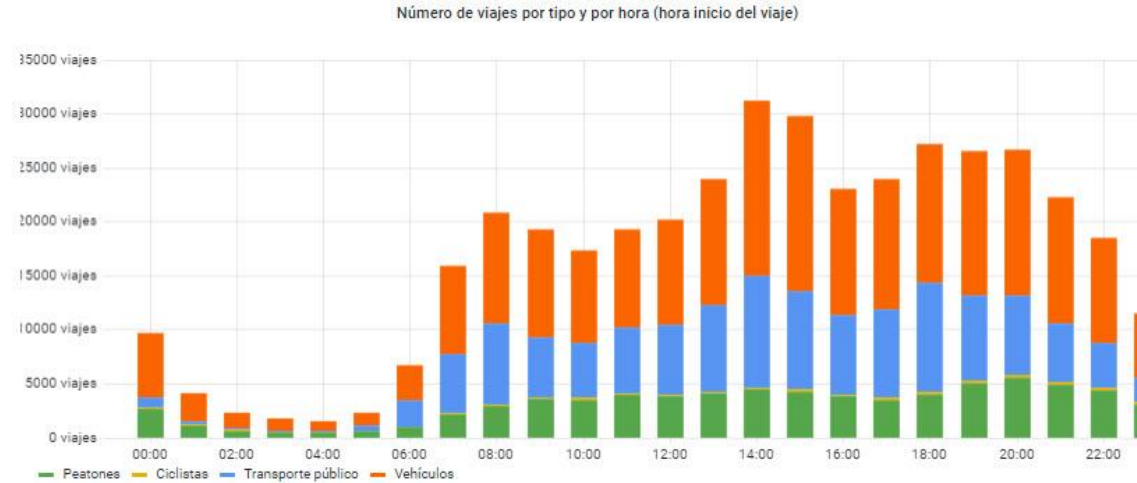Estaciones de aforo ciclista. Doctor Esquerdo y Plaza España

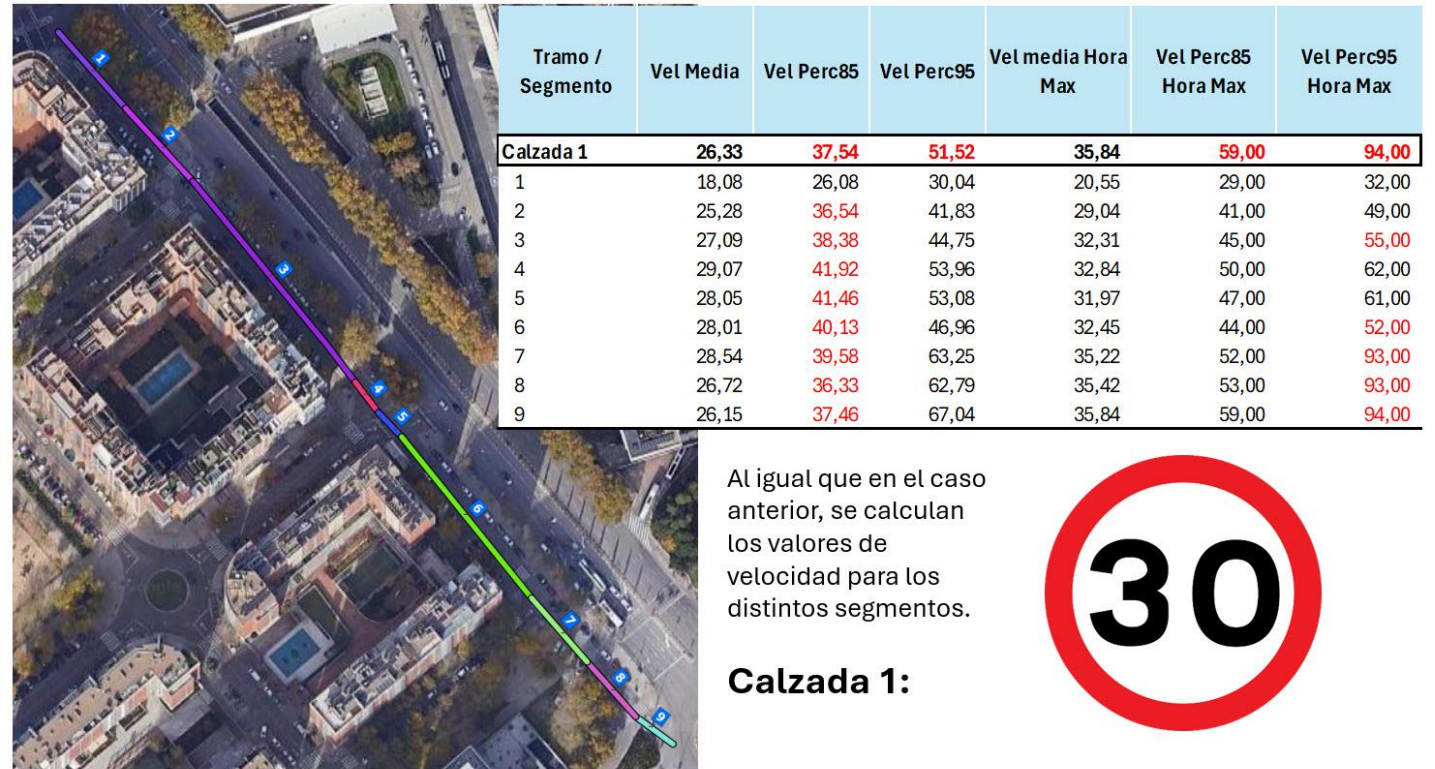Todas trayectorias en Princesa e invasiones de carril bici en Serrano

• **Mobility Data through Telephony.**

- Every time a mobile device connects to the phone network it connects to several phone antennas. By triangulating its signal and using further algorithms it is possible to geo-reference that device, which together with a timestamp allows the use of this data in a very valuable way to study mobility.

Número de viajes por tipo y por hora (hora inicio del viaje)

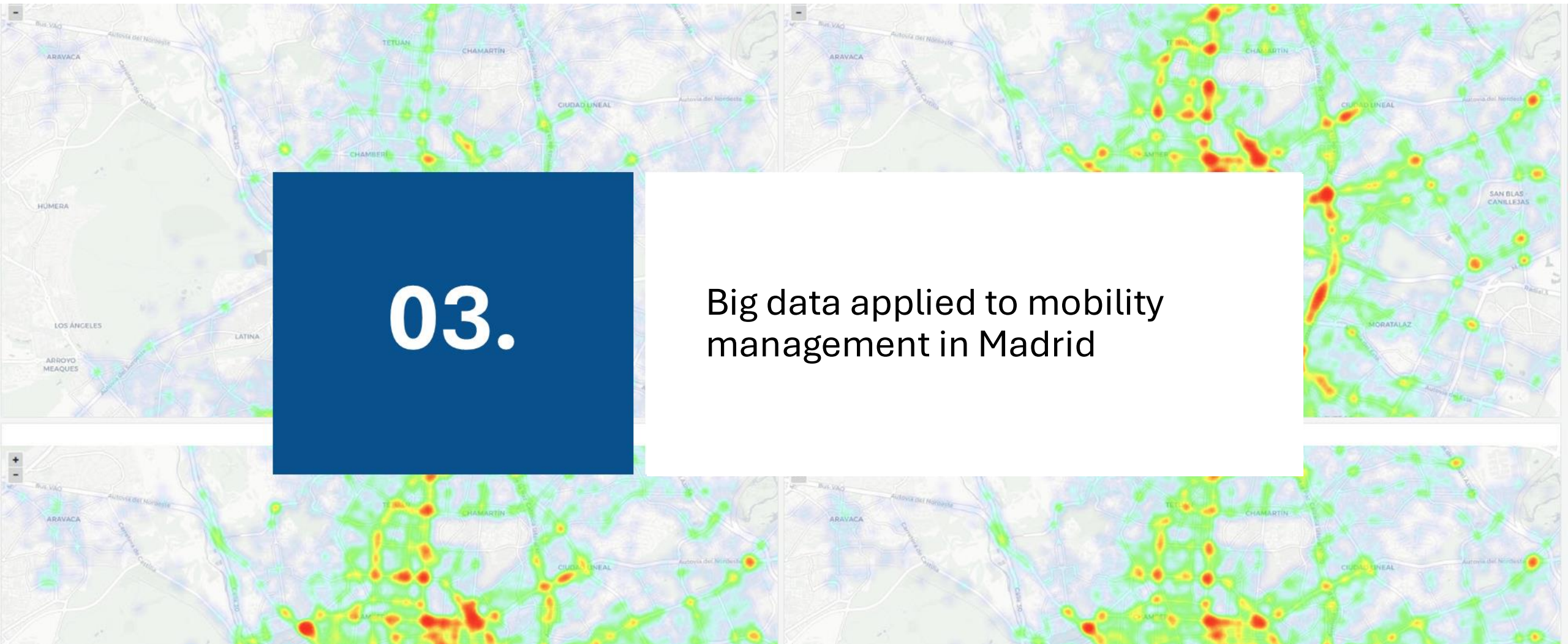Peatones   Ciclistas   Transporte público   Vehículos

Data Generated by Floating Car Data (FCD)

- Data obtained from moving vehicles provide valuable information on traffic flow.

- Speed reports on large samples.

- Example: School environments speed report.

Tramo / Segmento	Vel Media	Vel Perc85	Vel Perc95	Vel media Hora Max	Vel Perc85 Hora Max	Vel Perc95 Hora Max
Calzada 1	26,33	37,54	51,52	35,84	59,00	94,00
1	18,08	26,08	30,04	20,55	29,00	32,00
2	25,28	36,54	41,83	29,04	41,00	49,00
3	27,09	38,38	44,75	32,31	45,00	55,00
4	29,07	41,92	53,96	32,84	50,00	62,00
5	28,05	41,46	53,08	31,97	47,00	61,00
6	28,01	40,13	46,96	32,45	44,00	52,00
7	28,54	39,58	63,25	35,22	52,00	93,00
8	26,72	36,33	62,79	35,42	53,00	93,00
9	26,15	37,46	67,04	35,84	59,00	94,00

Al igual que en el caso anterior, se calculan los valores de velocidad para los distintos segmentos.

Calzada 1:

*Estudio de velocidades en Méndez Álvaro*

03.

Big data applied to mobility management in Madrid

# SIDERA Analytics: The Big Data and AI platform applied to mobility planning

The large amount of data generated by new technologies associated with city traffic requires new and more powerful tools to enable managers to perform accurate analysis.

This graph shows the data obtained from the telephony of journeys with origin and/or destination the city of Madrid.
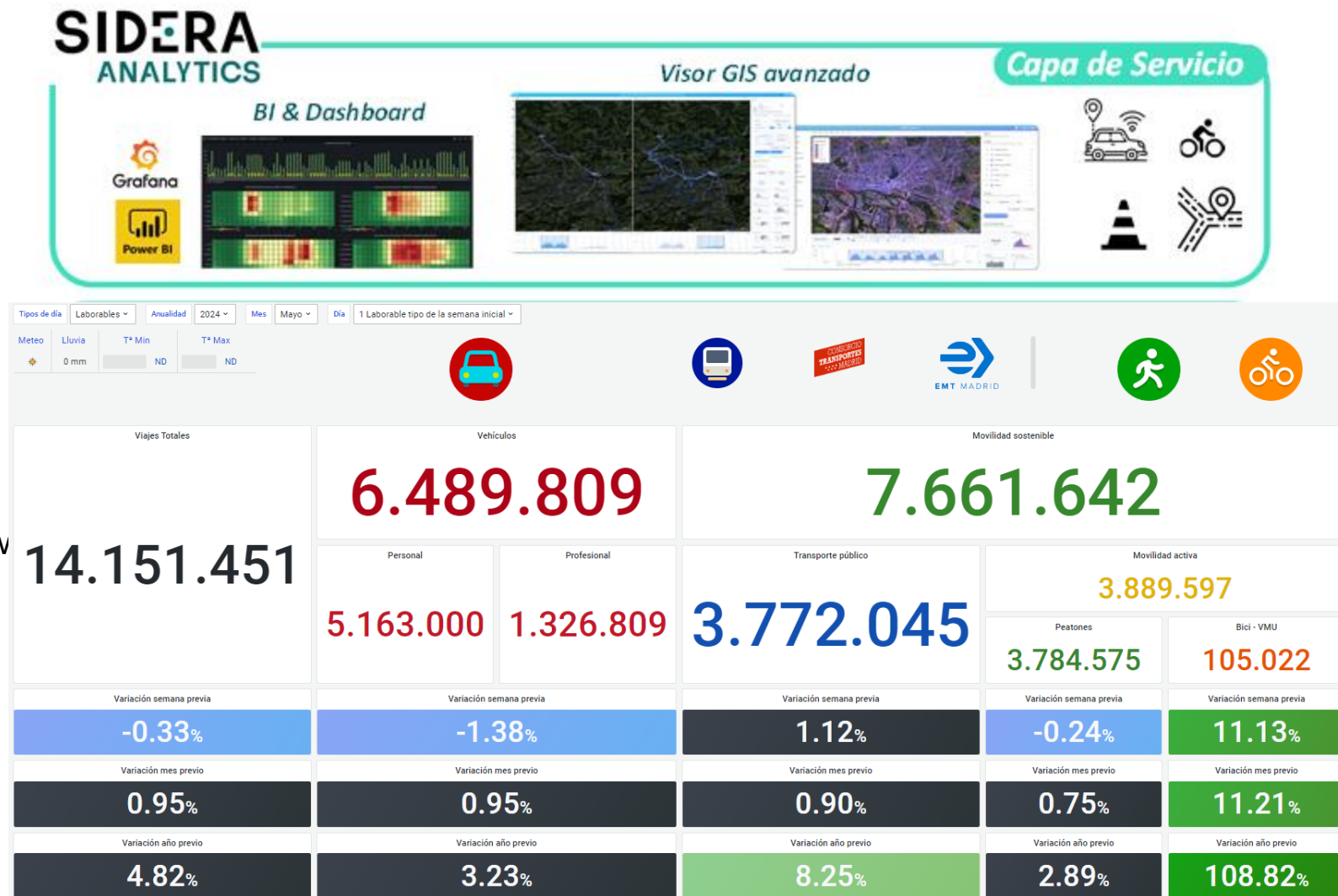
SIDERA Analytics:

- The Big Data and AI platform applied to mobility planning has been created thanks to a close collaboration between SICE and the technicians of the Madrid City Council, in a live and iterative process to make the most of mobility data (both historical and those generated on a daily basis) and that can be useful when making decisions.
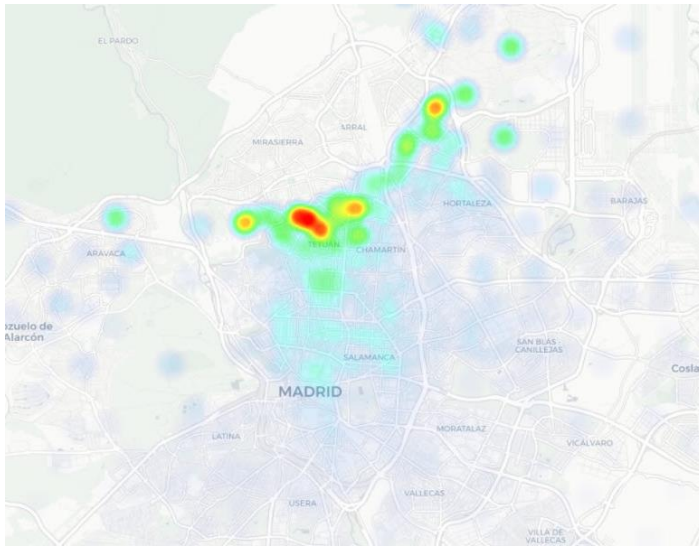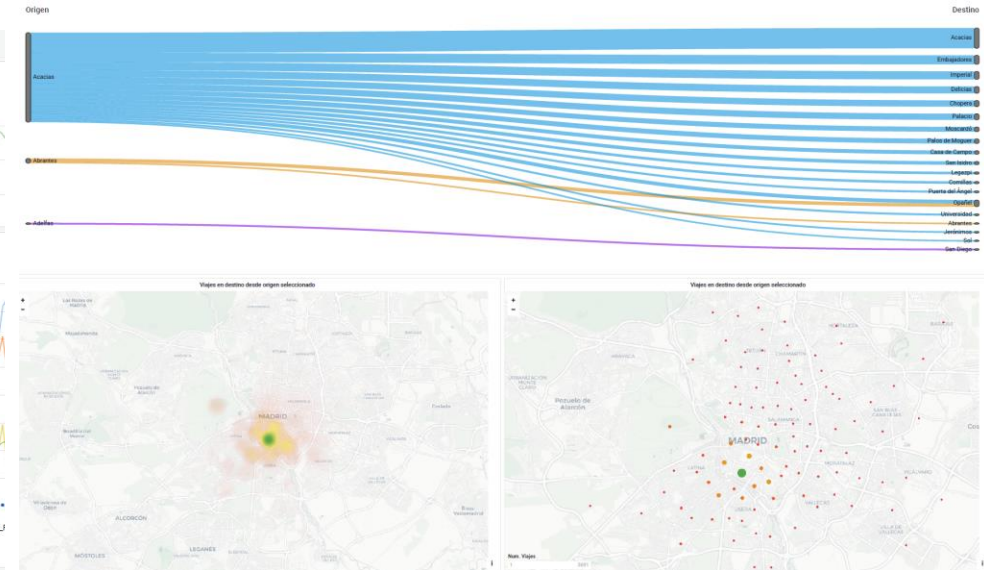

The platform has GIS viewers for a better understanding of the data.

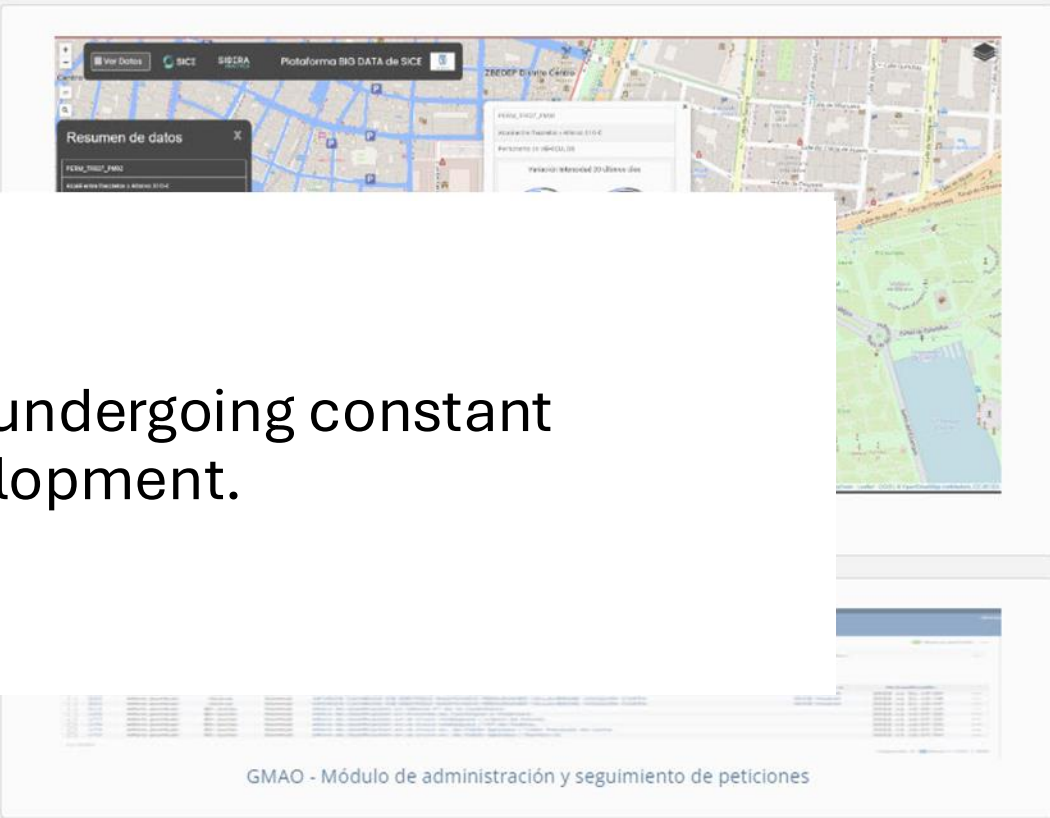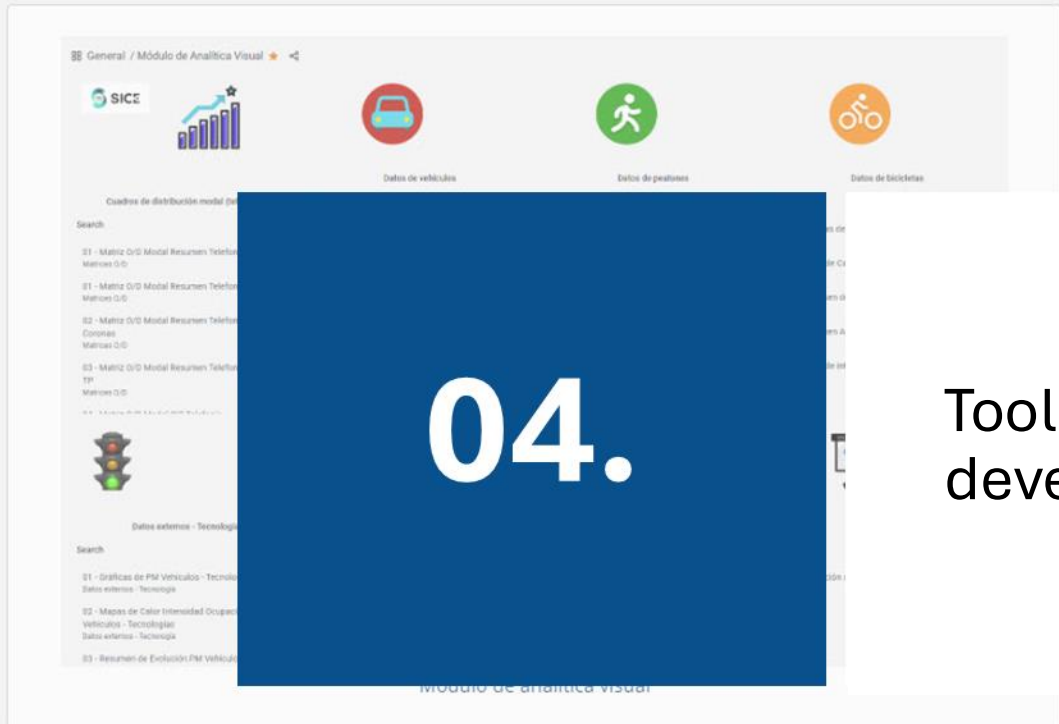Heat map matrix O/D trips by district.

Easy access to historical data

Data from permanent traffic flow stations displayed in an interactive way.

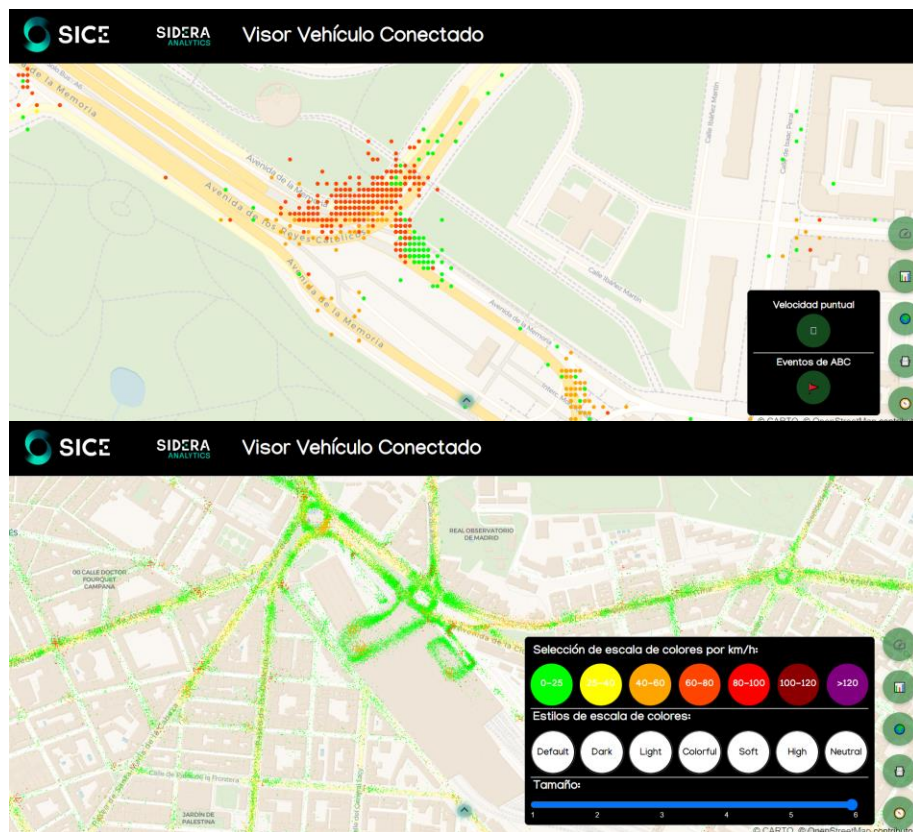**Capacity to integrate data from other agencies**

Data provided by EMT for the use of BICIMAD.

04.

Tool undergoing constant development.

SIDERA Analytics:

- One of the advantages of working with Big Data is that with the use of the tool, new use cases are generated as the project progresses.

Analysis of the correct location of vertical signage.

From the information extracted on braking, or ABC events at a given location, it is analysed whether the location of the vertical signage could have an impact on these drastic speed reductions. The analysis concludes whether relocation of signage is necessary.

Street-by-street speed analysis.

Geographical display of vehicle speeds on the city street map.