



SMARTCITY
EXPO WORLD CONGRESS



EXTRACT



BIG DATA AND AI FOR ENHANCED URBAN DECISION-MAKING

Venice & Barcelona

#SCEWC24

5 NOVEMBER 2024

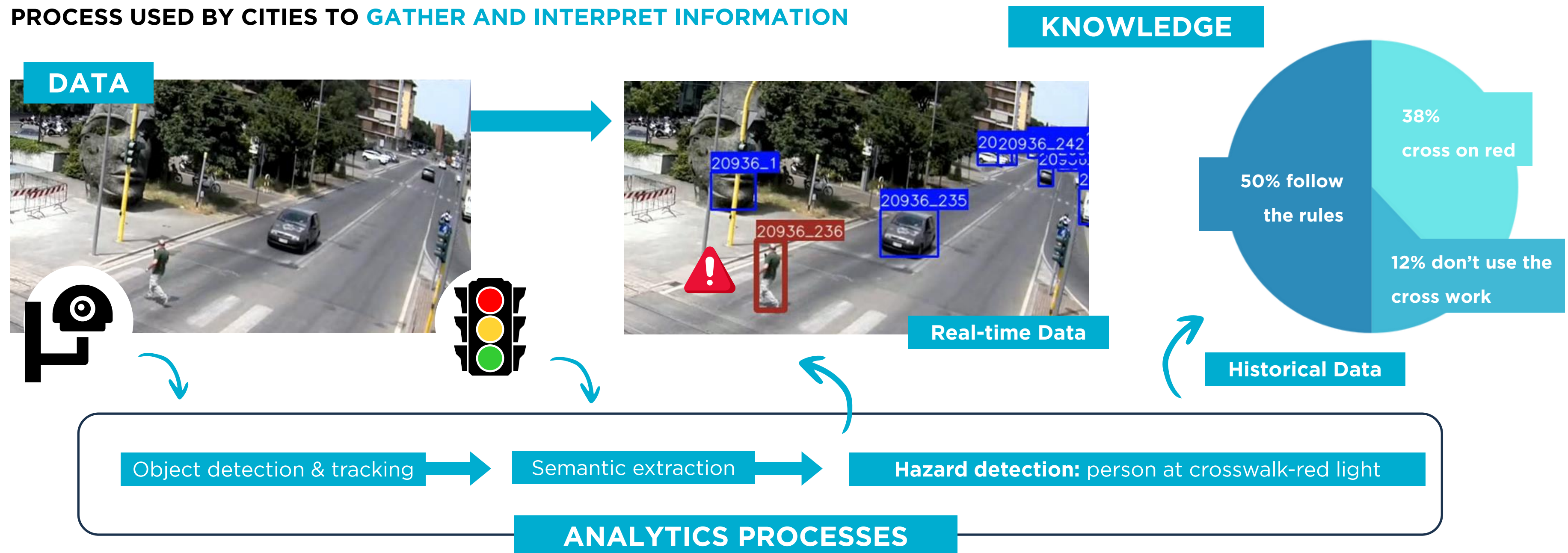
9:45 - 10:30, ORANGE AGORA

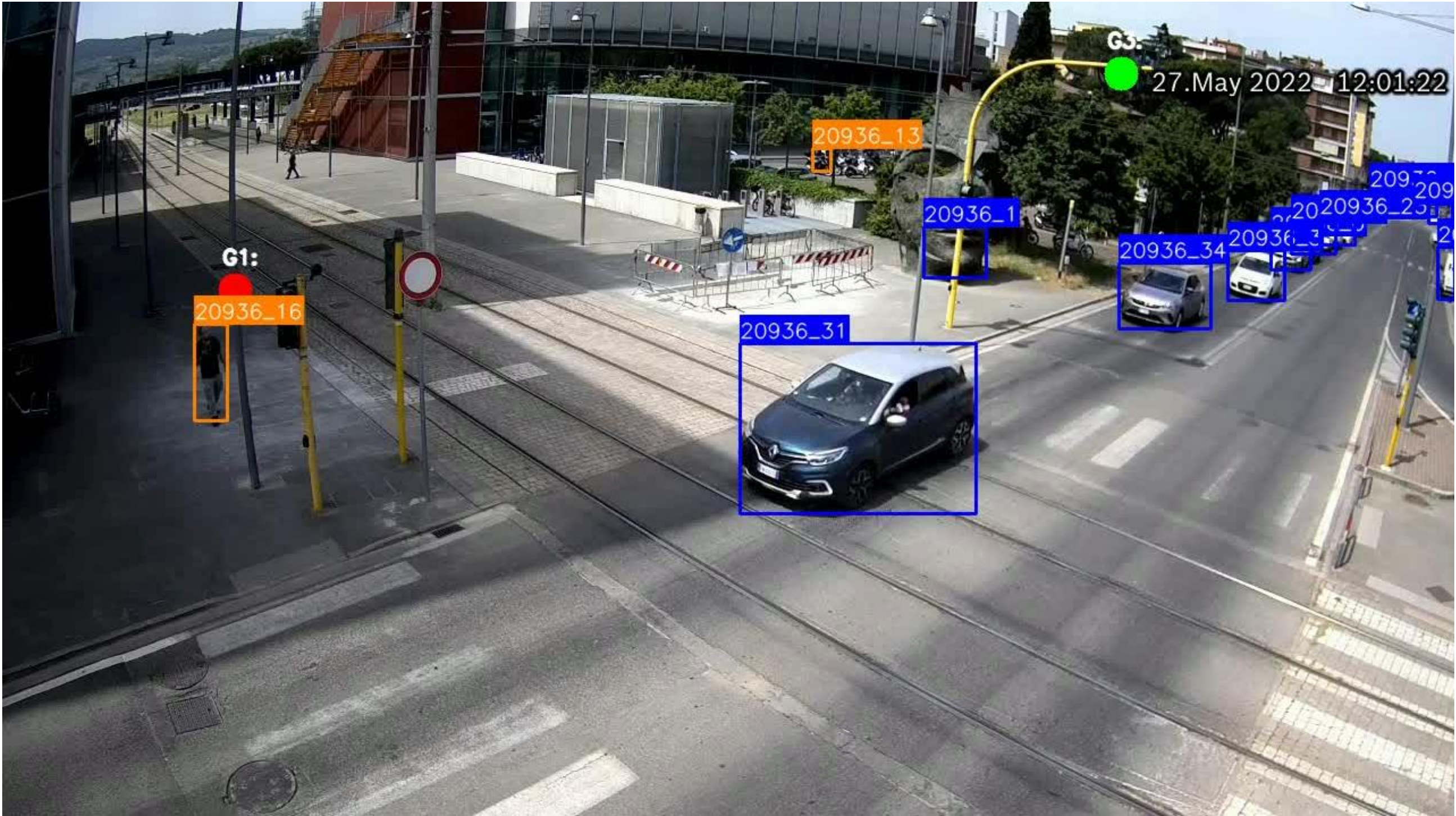


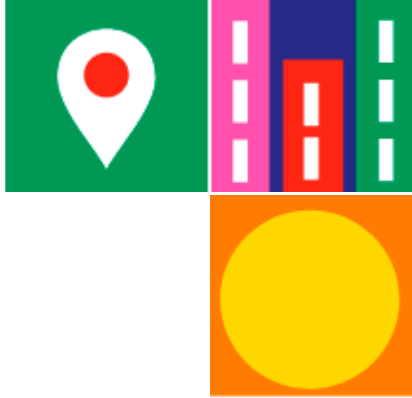


KNOWLEDGE MAKES CITIES SMARTER, NOT DATA

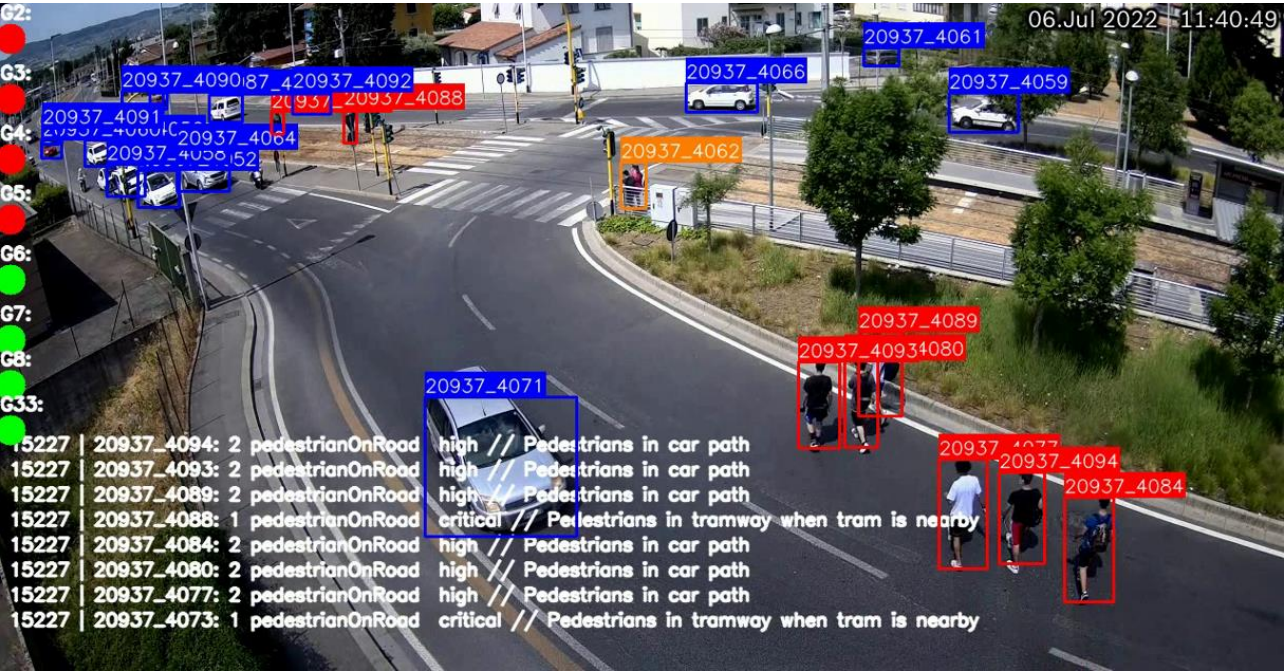
PROCESS USED BY CITIES TO GATHER AND INTERPRET INFORMATION



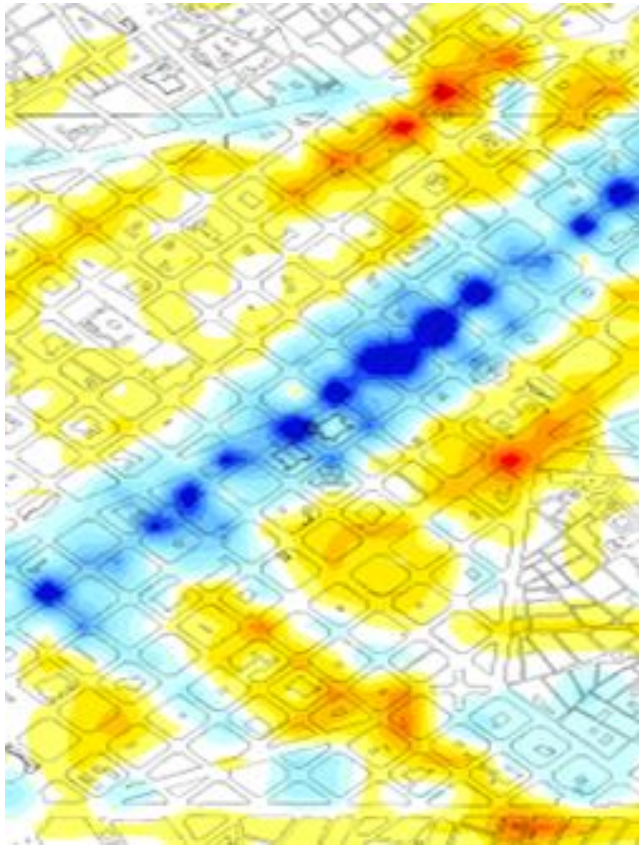




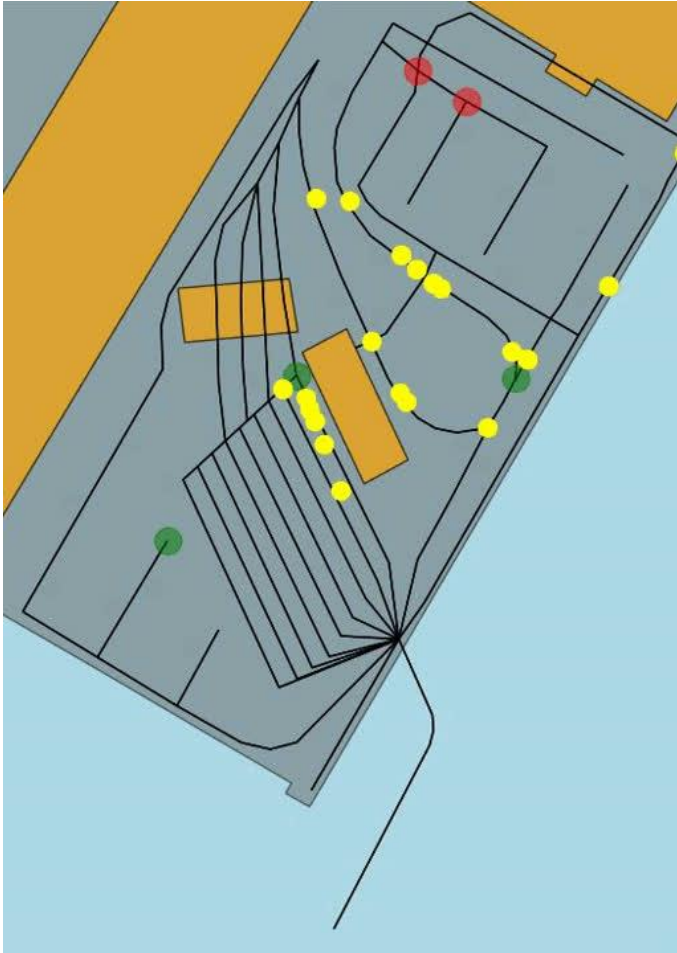
TECHNOLOGIES ALLOW US TO **EXTRACT KNOWLEDGE FROM DATA**



Enhanced AI Sensing Capabilities



Fine-grain Pollution Estimation
with Big Data analysis



Personalized Evacuation Route
Planning with Reinforcement
Deep Learning

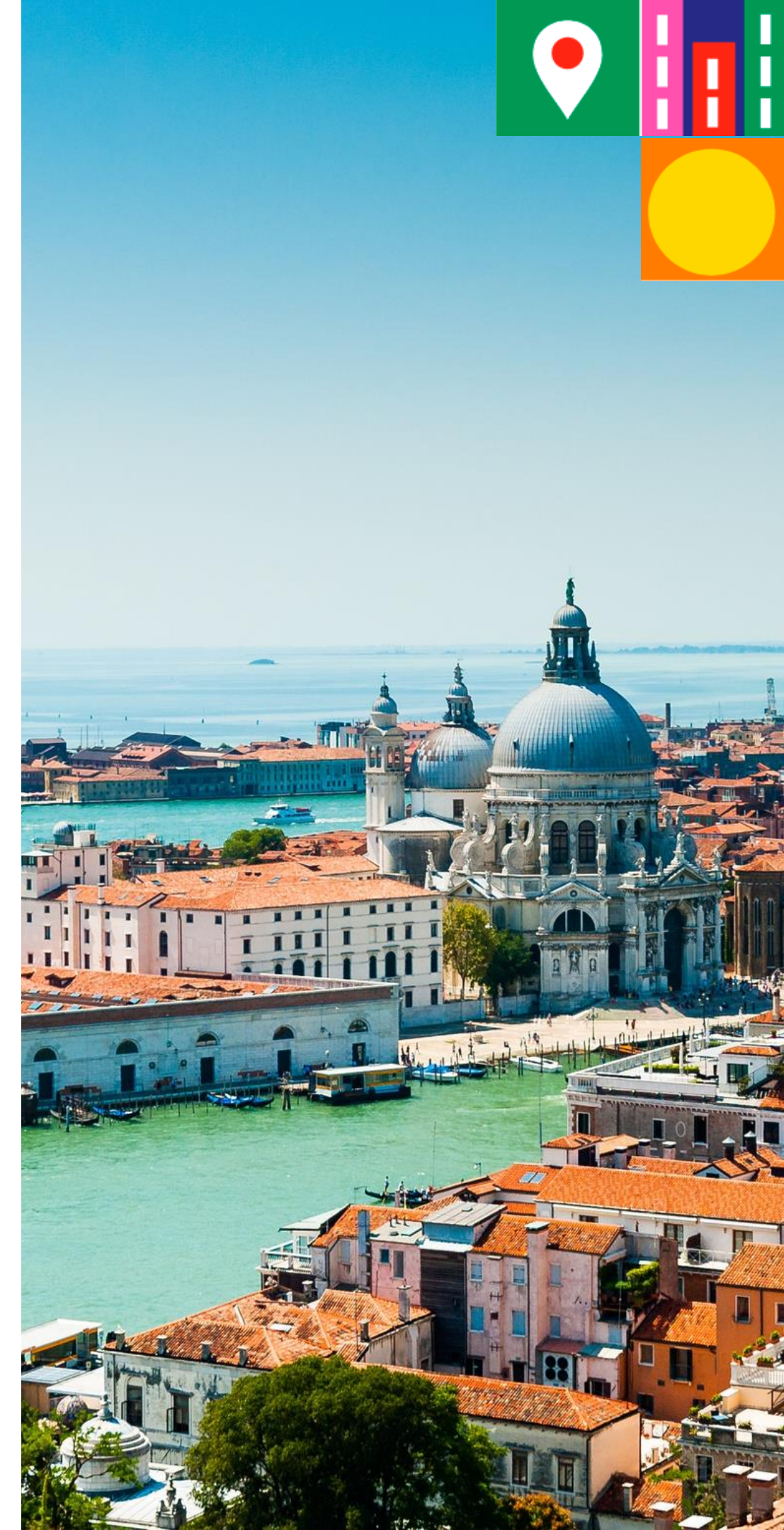
THE CHALLENGE

THE CITY OF VENICE

- Small medieval-renaissance town
- Built on water, in the heart of a shallow lagoon
- Its road system is made up of narrow streets, channels and bridges
- A single large pedestrian zone
- There is only one causeway that connects Venice to the mainland, which is Liberty Bridge

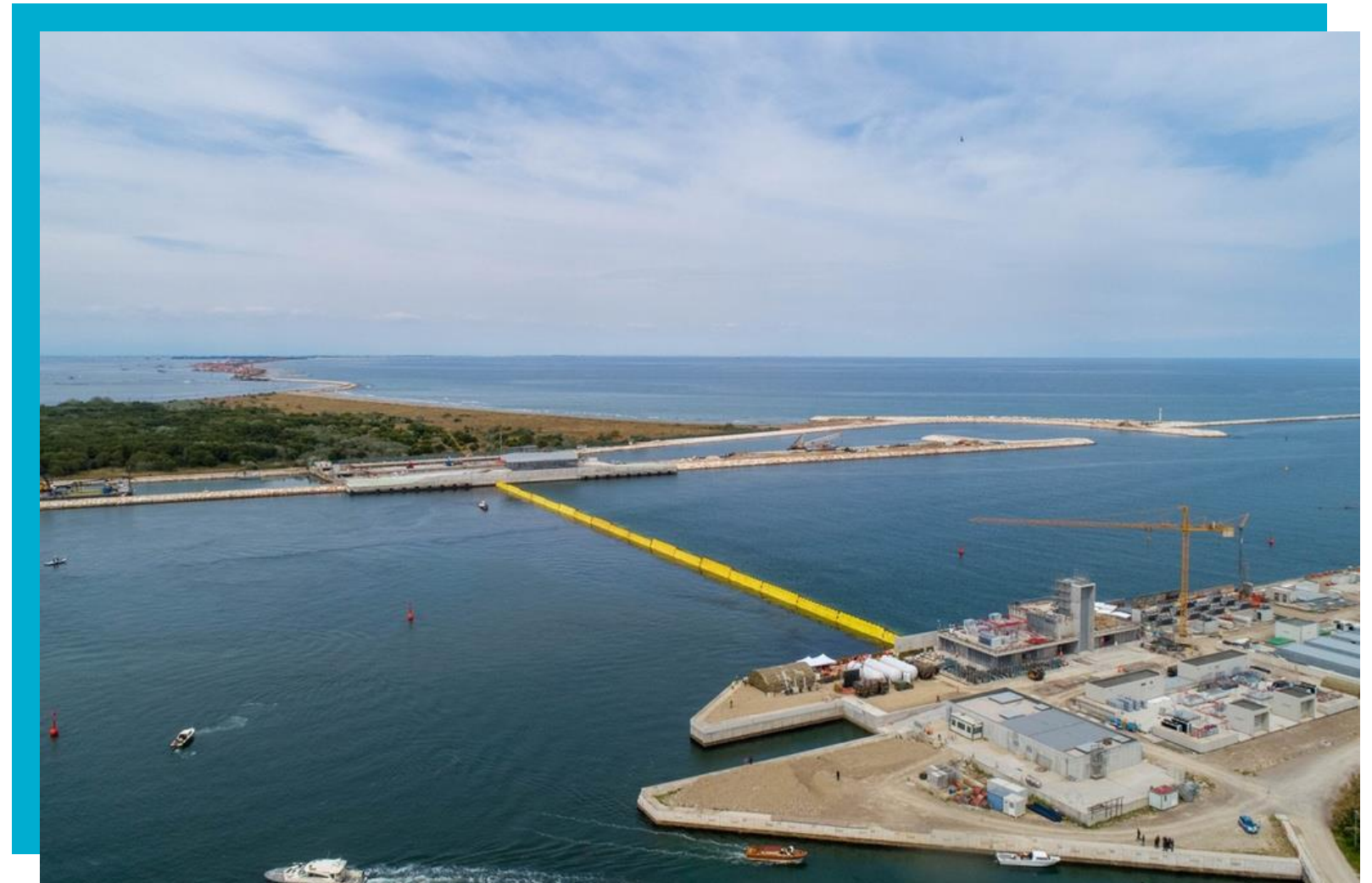
PRESENCE ON A (ORDINARY) DAY

35.000 tourists
30.000 daily visitors
15.000 commuters
50.000 inhabitants

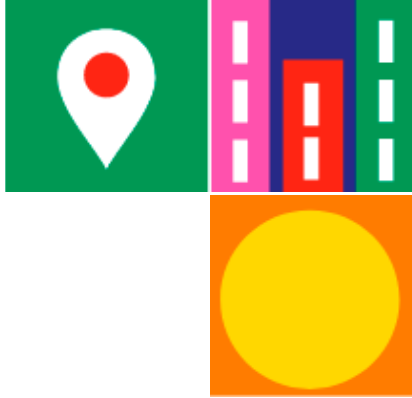




BEFORE



AFTER



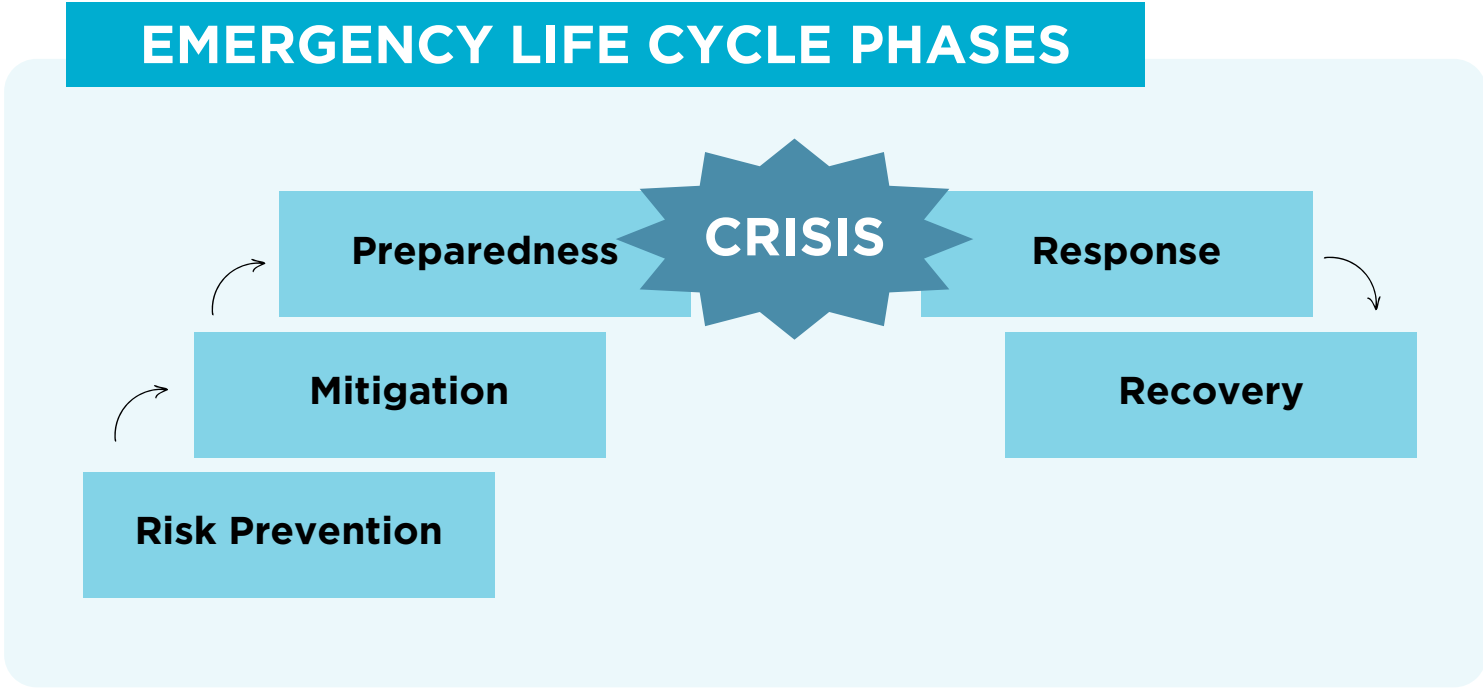
HAZARD AND DISASTERS

HAZARD

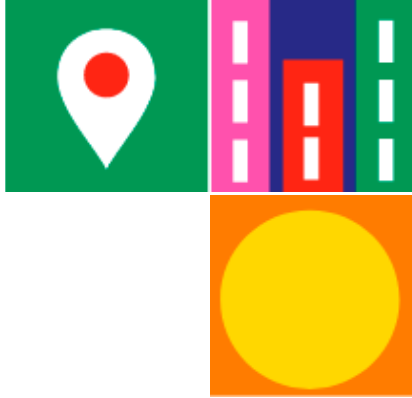
- Natural phenomenon that can potentially trigger a disaster
 - *Example:* Earthquake, Floods, Tsunami
- These events need **not necessarily result in a disaster**

Disaster

- Serious disruption involving widespread human, material, economic or environmental losses and impact



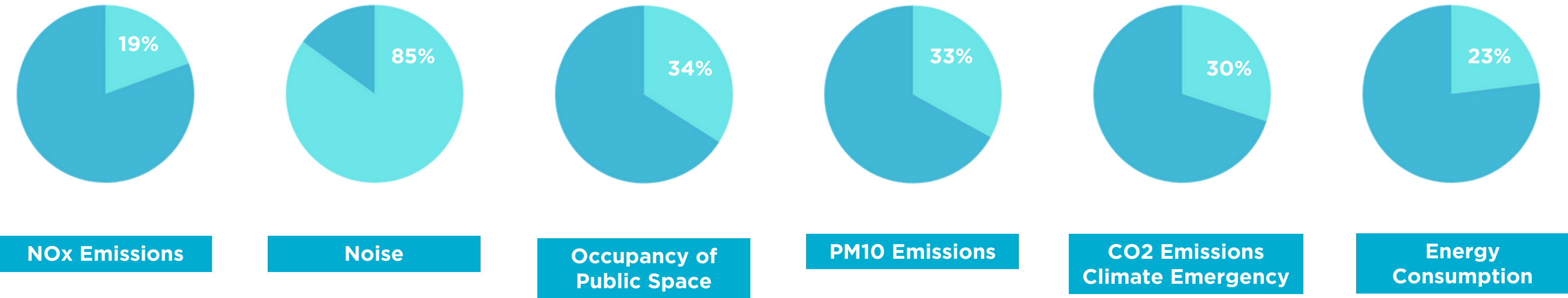
HAZARDS MAY BE INEVITABLE, BUT DISASTERS CAN BE PREVENTED
KNOWLEDGE ALLOWS FOR HAZARD DETECTION AND DISASTER PREVENTION



THE CHALLENGE

BARCELONA

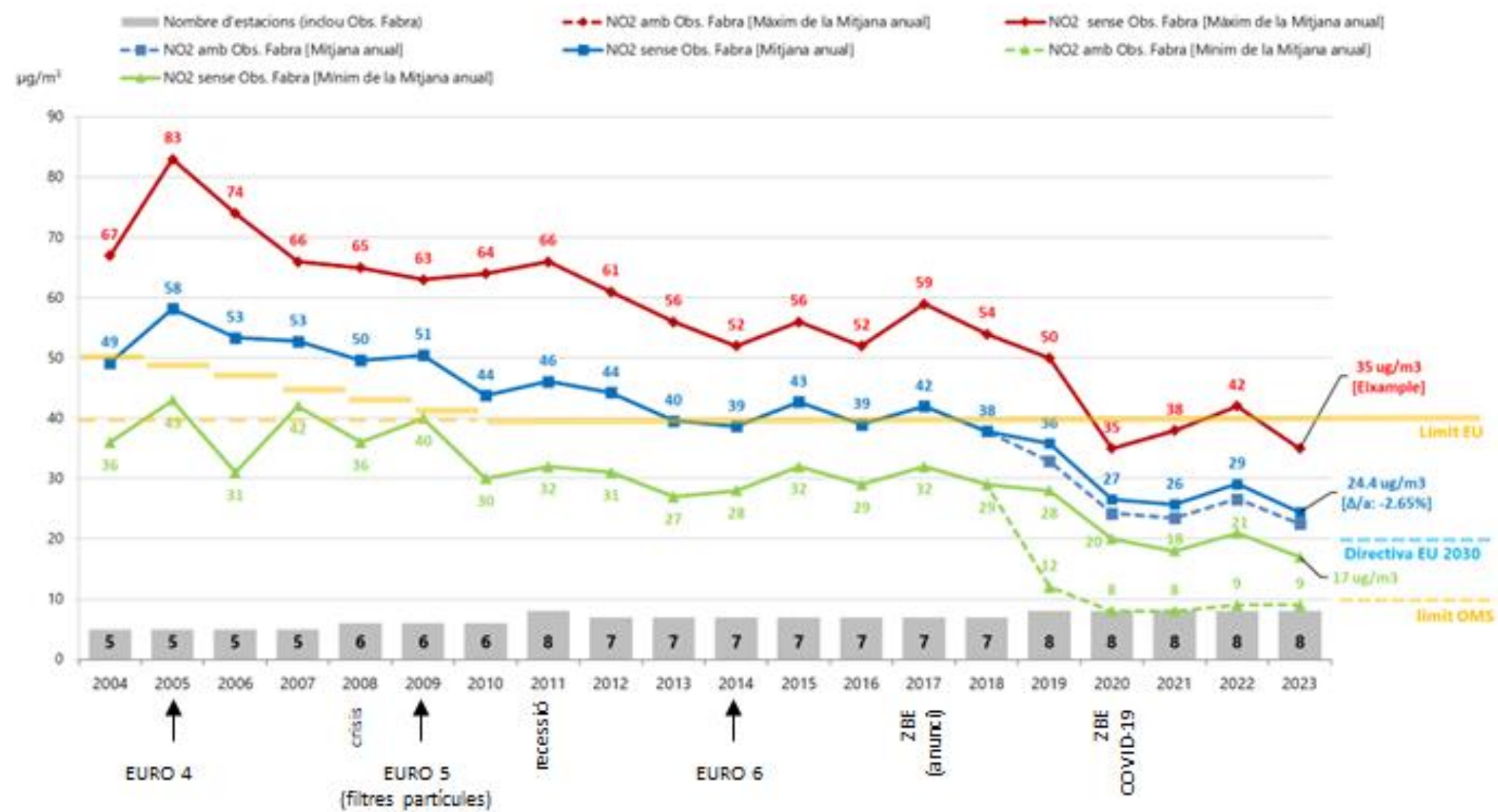
MOBILITY IN BARCELONA: A SOURCE OF ENVIRONMENTAL EXTERNALITIES





AIR QUALITY

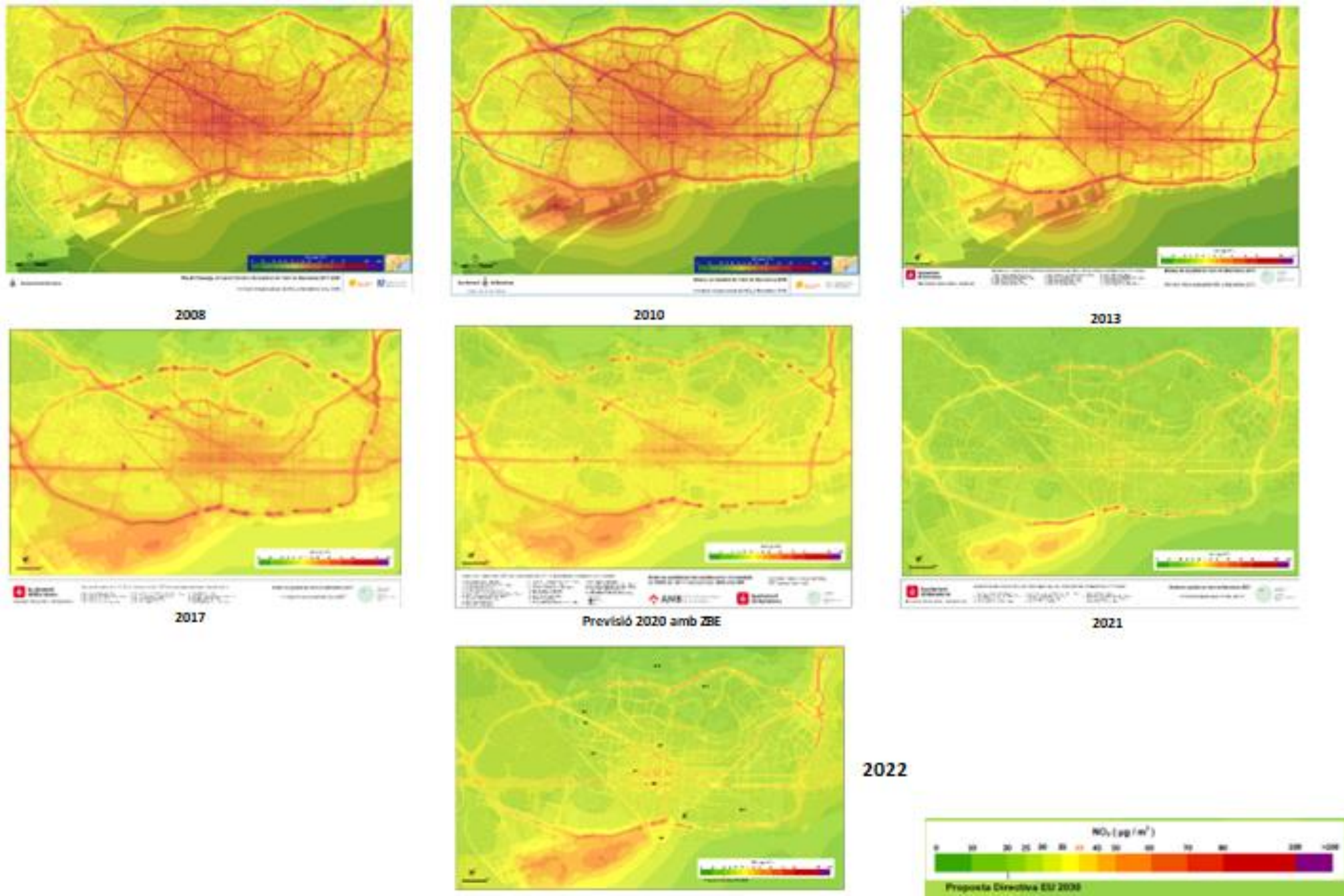
EVOLUTION OF THE ANNUAL NO2 EMISSIONS OF THE XVPCA STATIONS OF BARCELONA



2023, NO2 compliance will be achieved at all stations in Barcelona, with a maximum value of 35 $\mu\text{g}/\text{m}^3$ in the Eixample.

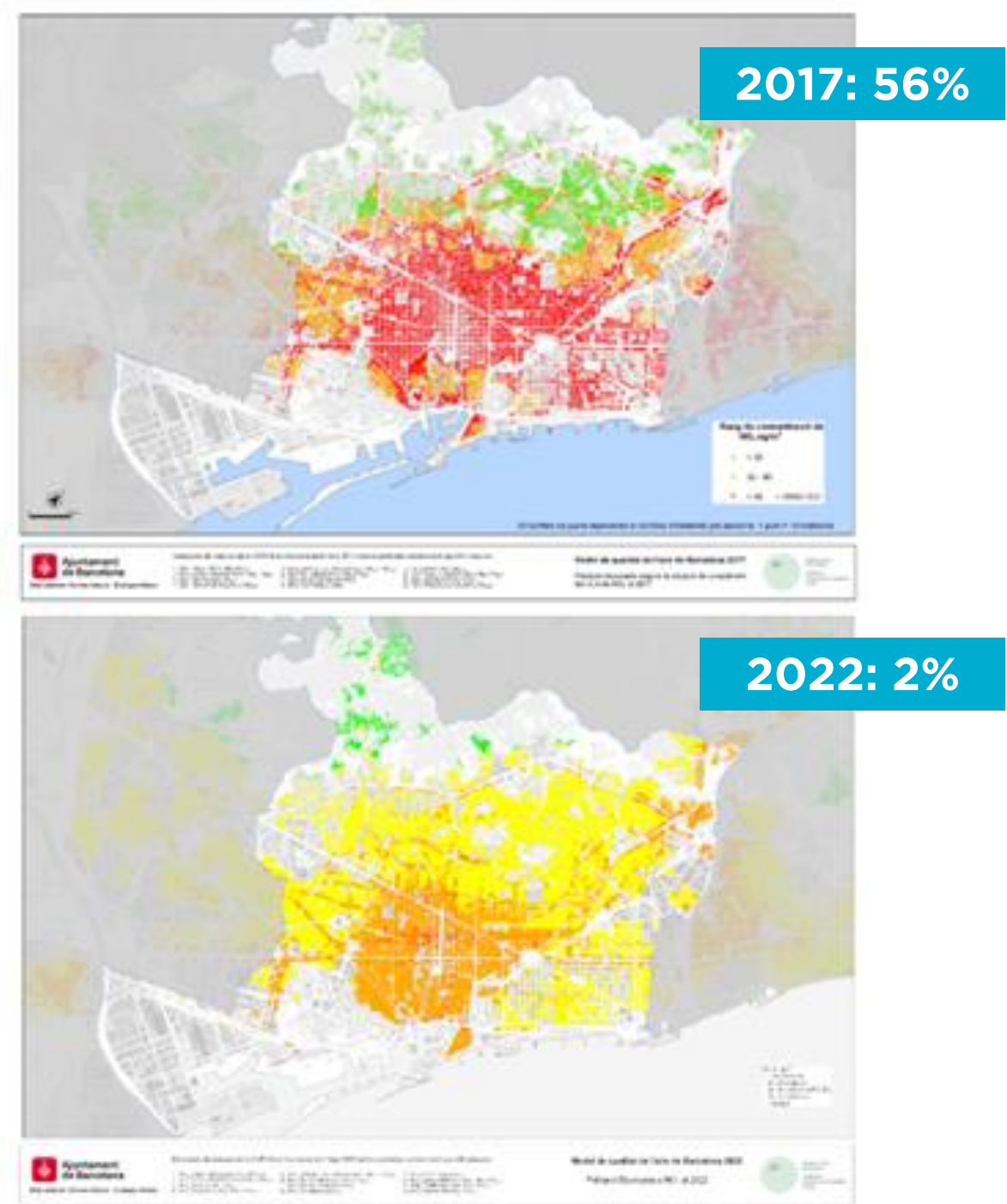


EVOLUTION OF NO2 CONCENTRATION

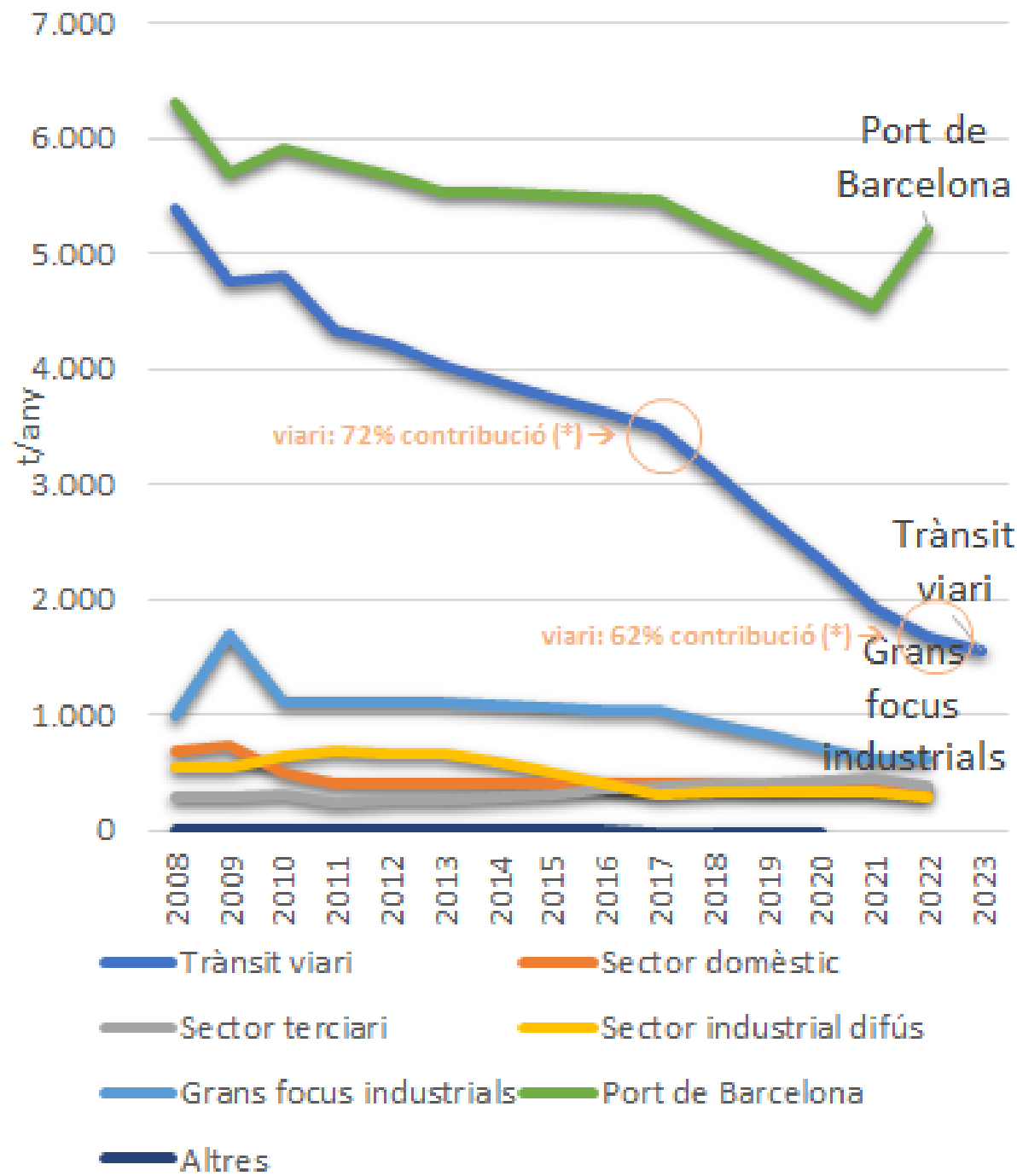




EXPOSURE OF THE POPULATION TO NO2



EVOLUTION OF NOX EMISSIONS

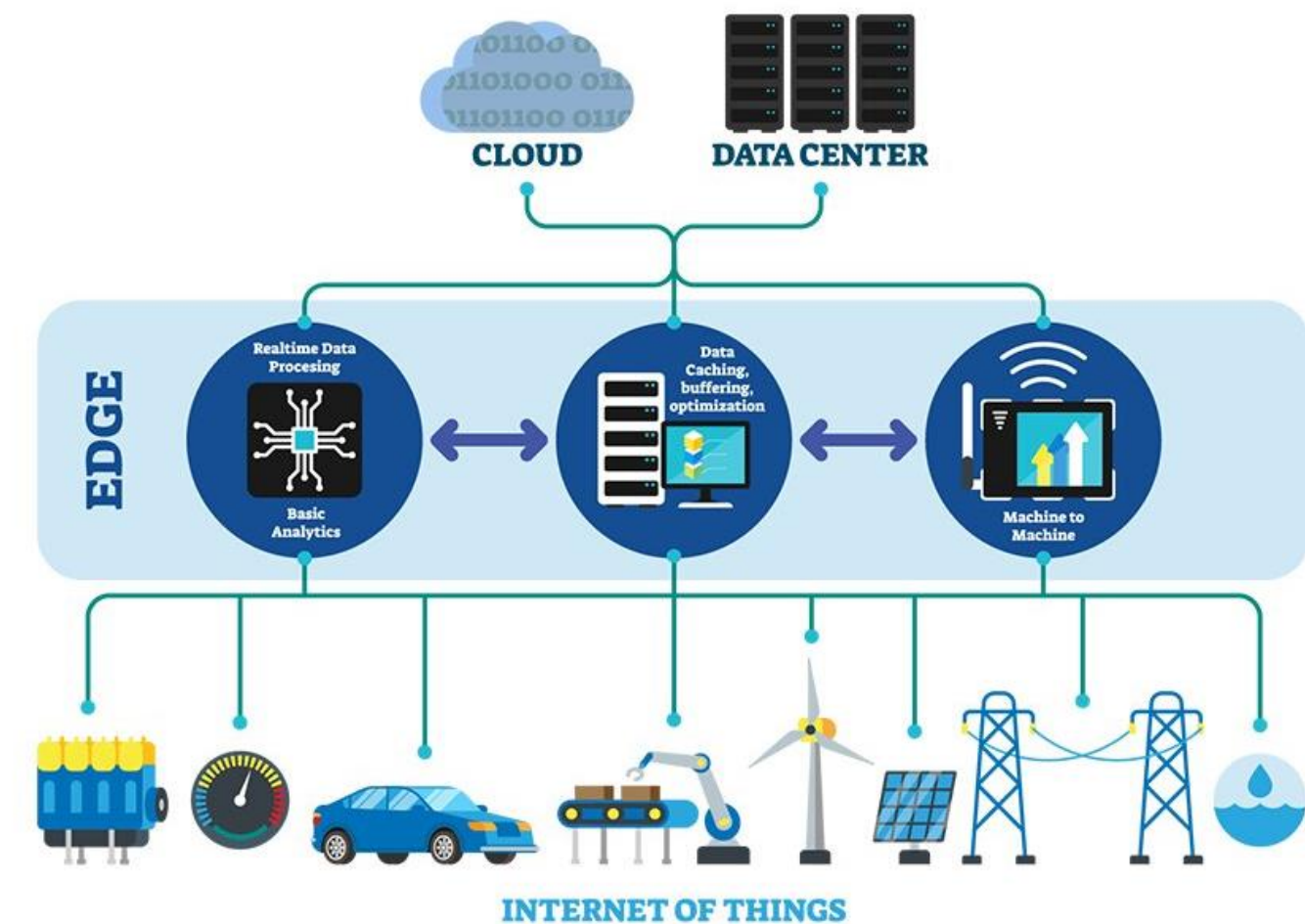


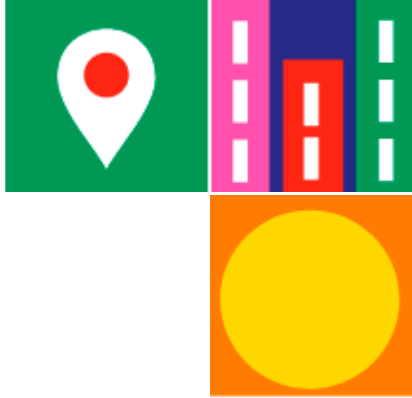


CITIES HAVE ACCESS TO MANY TECHNOLOGICAL SOLUTIONS

- **Edge Computing** at the source in cities for fast, private, economical processing
- **Cloud Computing** for housing a lot of information
- **High Performance Computing** for large work loads, complex AI models

**TOOLS ARE NEEDED TO FACILITATE
THE DEVELOPMENT AND EXECUTION OF
ANALYTICS PROCESSES**





OUR PROJECTS

DEVELOPMENT AND EXECUTION OF COMPLEX ANALYTICS PROCESSES



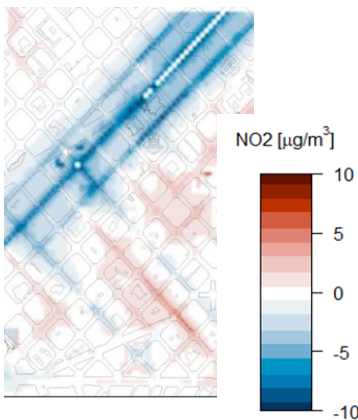
www.extract-project.eu

PERSONALIZED EVACUATION
ROUTE IN COLLABORATION
WITH VENICE



www.proyecto-ascender.com

MOBILITY AND AIR POLLUTION
MONITORING IN COLLABORATION
WITH BARCELONA



Air quality model



www.verge-project.eu

AUTONOMOUS TRAM
IN COLLABORATION WITH
FLORENCE

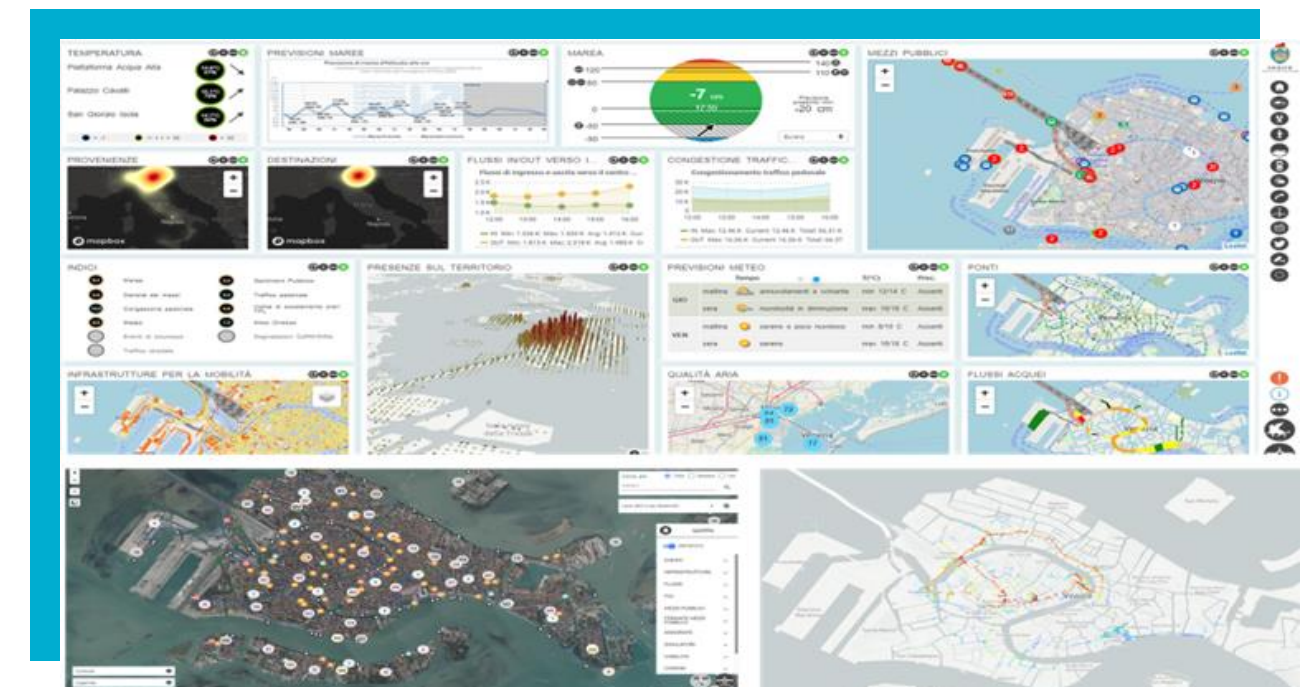
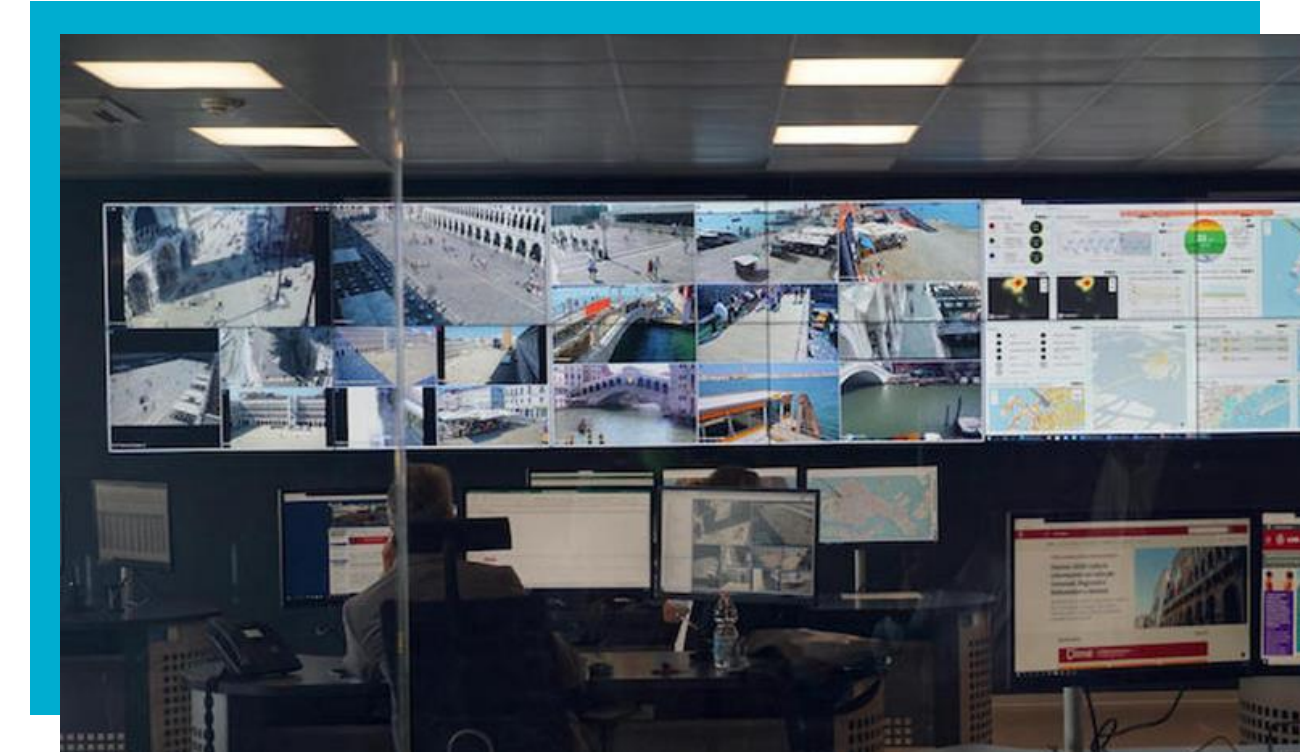


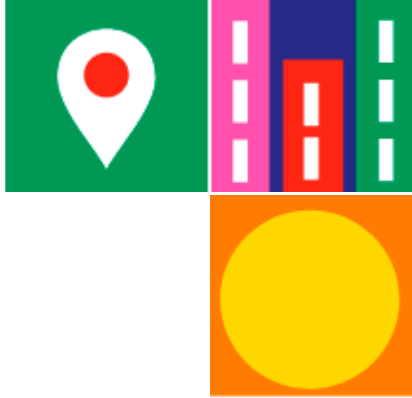
BIG DATA MANAGEMENT

VENICE

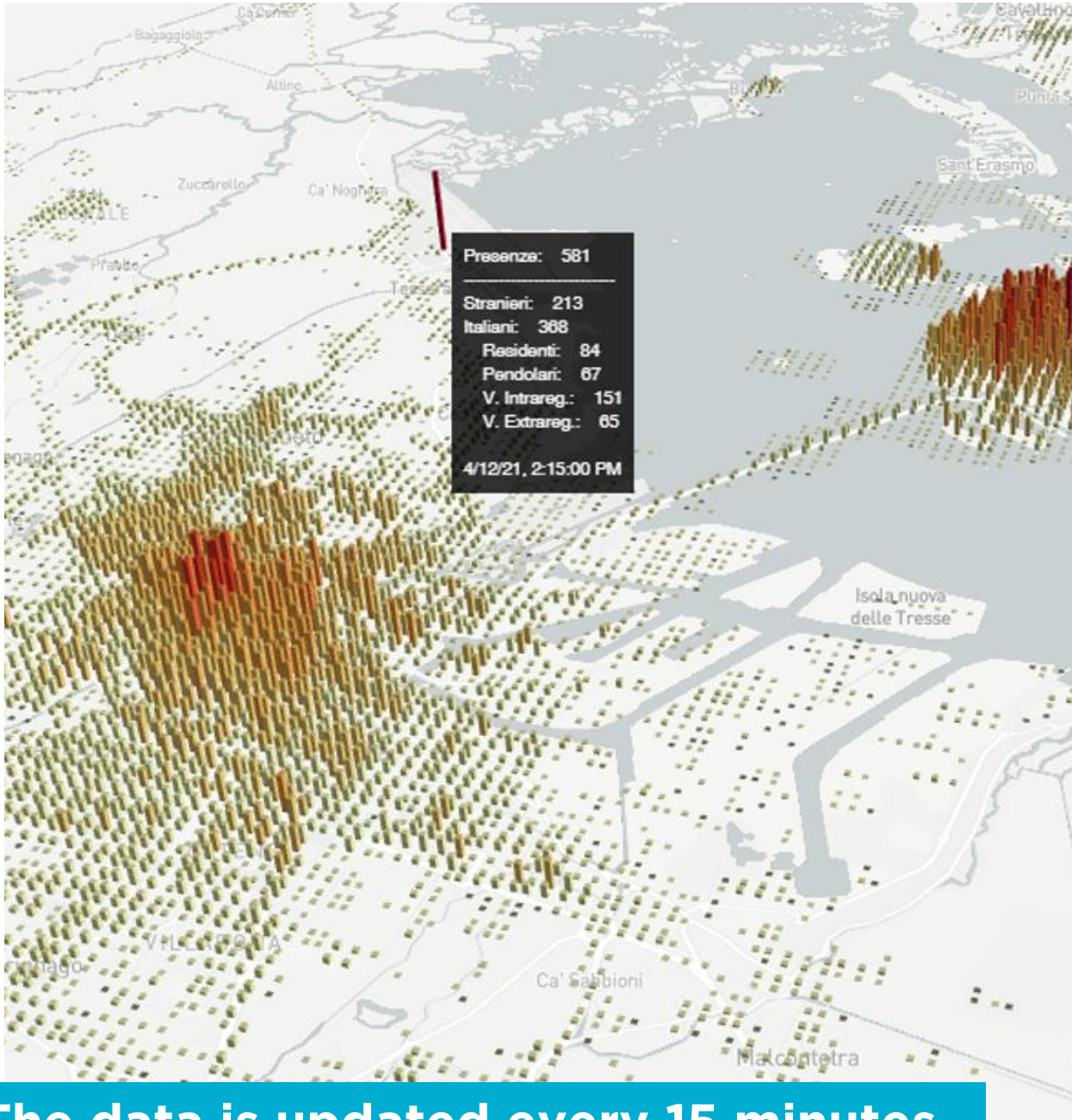
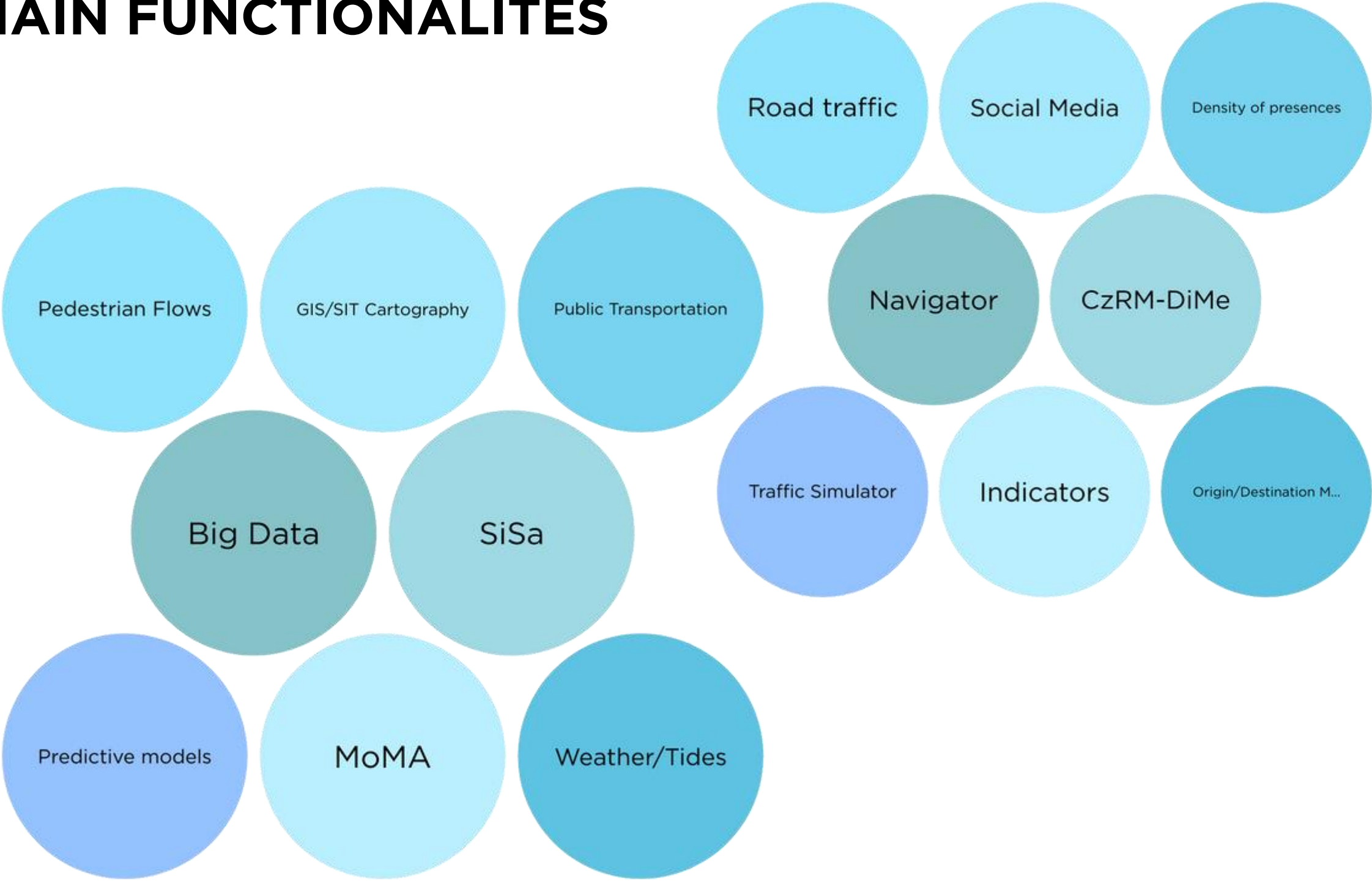
The **Smart Control Room** in Venice is a cutting-edge facility designed to enhance the city's **mobility**, **safety**, and overall **livability**

- Launched in September 2020, this "control tower" integrates data from various sensors and control units across the city to **monitor and optimize public services in real-time**.
- **24/7 Operation:** Staffed by specialized operators who work around the clock to ensure the city's safety and efficiency.
- Managed in collaboration with the **City Council, Local Police, and TIM**, a major telecommunications company.





SMART CONTROL ROOM: MAIN FUNCTIONALITES

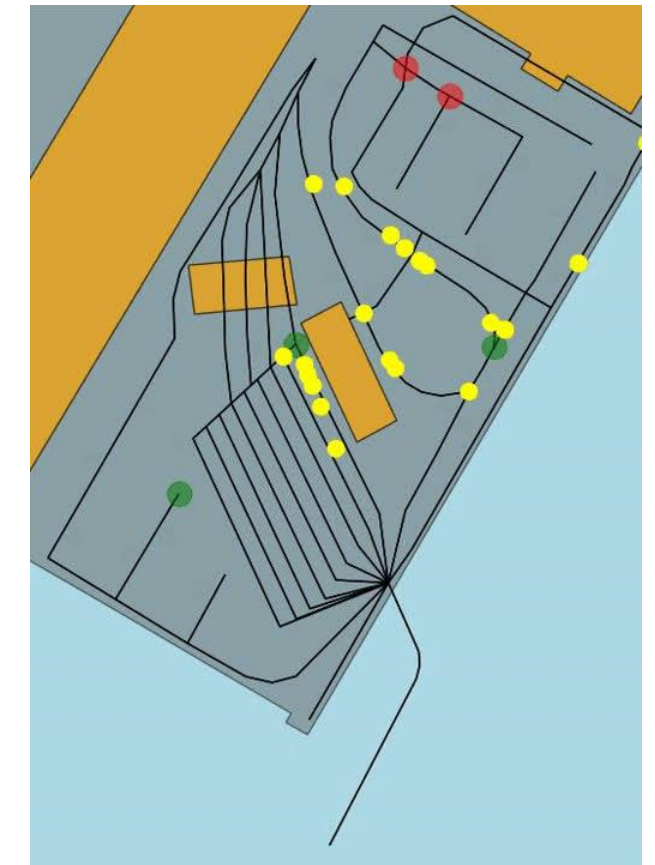


The data is updated every 15 minutes

DATA INTEGRATION

Venice collects and processes data on **pedestrian flow, parking, public and private transport**, and more

- **Advanced Technology**: Utilizes artificial intelligence, Internet of Things (IoT) sensors, and data analysis platforms
- **Urban Digital Twin**: Creates a dynamic and accurate virtual model of the city, integrating both historical and real-time data
- The **simulaton environment** uses detailed models of Venice's geography and infrastructures to simulate potential emergencies, allowing emergency planners to test and refine evacuation strategies under various conditions



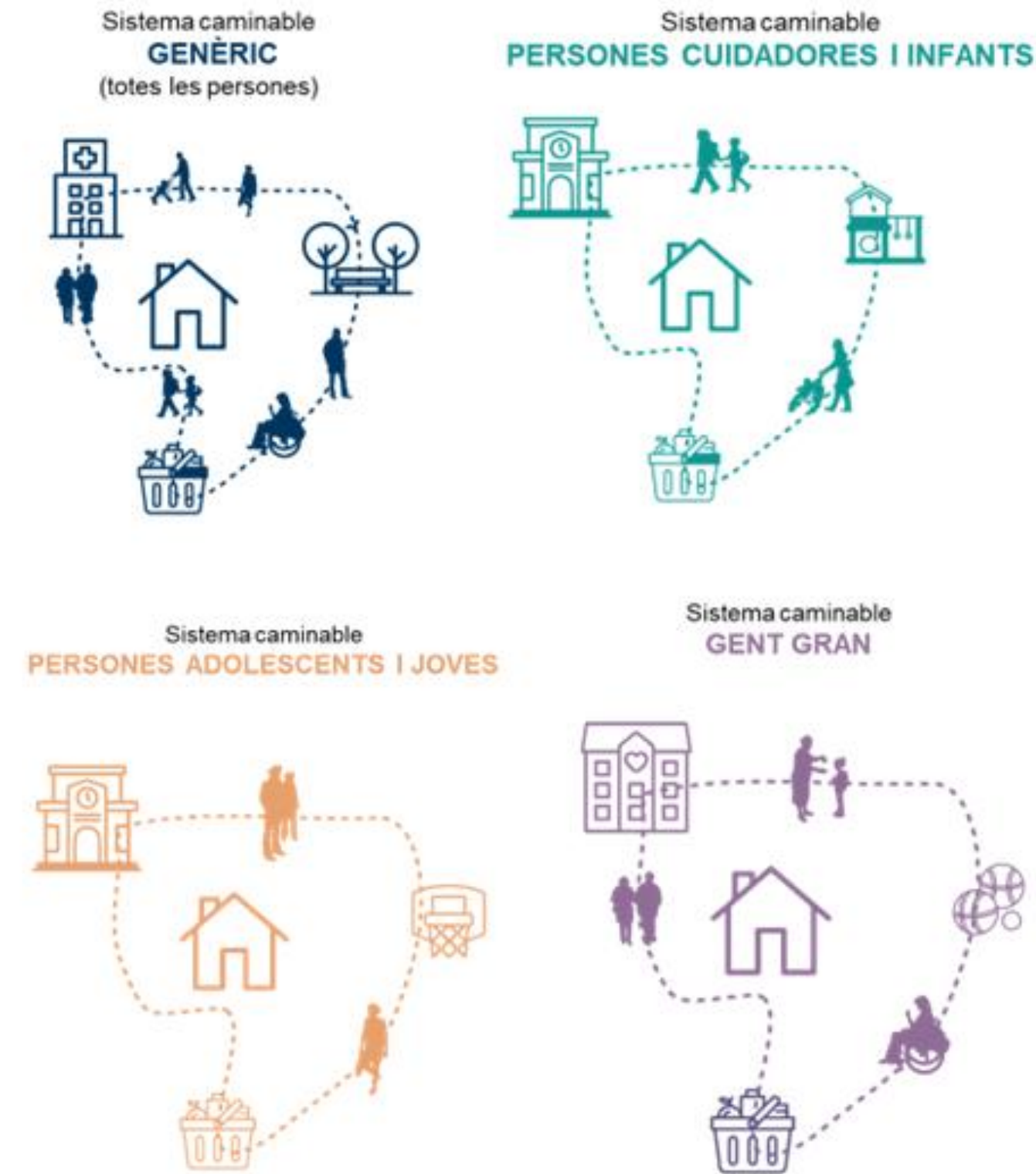
BIG DATA MANAGEMENT

BARCELONA

IDENTIFICATION OF WALKABLE SYSTEMS

CATEGORIZATION

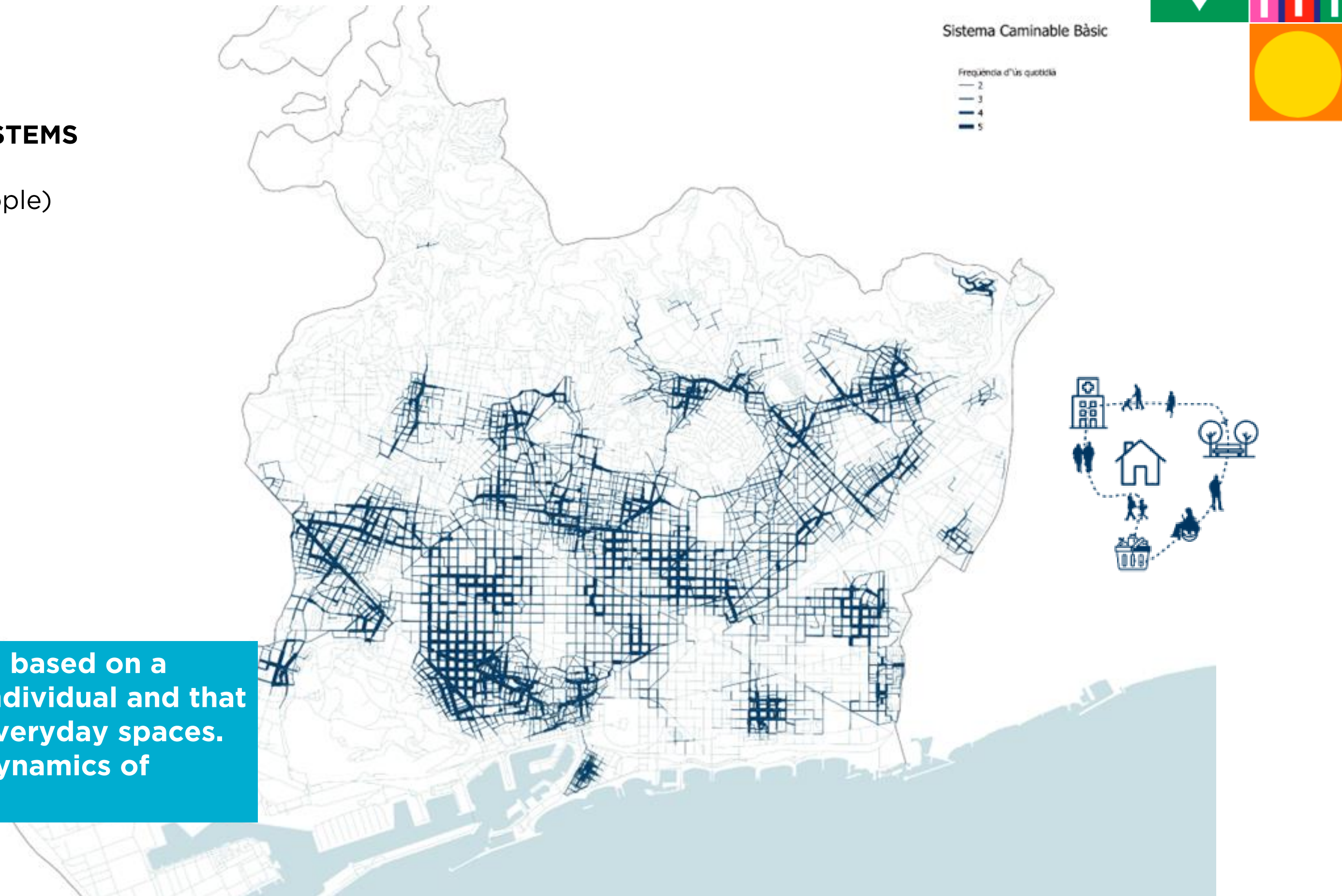
- **Basic** (all people)
- **Children and carers** (from 0 to 11 years old and adults from 18 to 65 years old)
- **Teenagers and young people** (from 11 to 17 years old)
- **Elderly people** (over 65 years old)



CITY DIAGNOSIS: WALKABLE SYSTEMS

- Walkable system BASIC (all people)
- 600m in 10 min

Walking itineraries are based on a generic profile of an individual and that link different critical everyday spaces. They respond to the dynamics of proximity to housing.





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Q&A

#SCEWC24



This ASCENDER project of the UNICO I+D Cloud program is funded by the Ministry for Digital Transformation and Public Administration and by the European Union – NextGenerationEU, within the framework of the PRTR and the MRR.



EXTRACT Project has received funding from the European Union's Horizon Europe programme under grant agreement number 101093110.



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FIND US AT THE BSC BOOTH
HALL 2, LEVEL 0, STREET D, STAND 151



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