The city of the future is data-driven: integrated mobility technologies and systems

The Smart City Genova project

More and more cities in Italy are launching Smart City projects (in 2022 the Smart City market in Italy will be worth EUR 900 million, with growth of 23% compared to 2021 - Source: Osservatorio Smart City PoliMi 22/23). At the same time, the attention of municipalities is currently focused on solving single problems to be addressed with vertical solutions, despite the fact that an integrated vision of the city may simultaneously achieve all the main benefits expected by citizens and administrators.

Smart Genova is a Programme, i.e. a set of coordinated and integrated projects whose mission is to make Genoa the most evolved Smart City in Italy, by developing and delivering innovative services dedicated both to the citizen and to the Municipality and more generally to the PA.

The mission of the Smart Genova Programme is divided into four main objectives:

- Reducing pollution and congestion in the Genoese area with a focus on reducing the CO_2 footprint
- Ensure equity of access to services for all citizens
- Favouring the use of public transport by road and rail
- Promote the use of electric vehicles and full electric sharing mobility
- Promote the operational logistics belt to and from the port system

The Smart Genova programme consists of several project areas, each of which involves technological partners with a focus on the re-use of local expertise

- The Smart City Genova project
- MaaS Project
- The Smart Logistics project

The Smart City Genova project

In the Smart City Genova project, Movyon, the Autostrade per l'Italia Group's technology, innovation, research and development company, plays the role of integrator and coordinates a team of outstanding partners, who have designed the solution in collaboration with ongoing projects in the area and with the city government.

Smart City Genova is the first project launched to equip the city with a data-driven system (Smart City System) that acquires data from the territory by means of the most advanced IoT technologies, correlates and processes the collected data with the use of advanced software and artificial intelligence, to provide citizens with evolutionary services and the PA with up-to-date and timely information, decision support systems and systems for the implementation of government actions.

Know and predict before deciding.

In other words, the Smart City System is a tool for designing and applying new urban planning strategies and new operational mobility management methods.

Some characteristics make Smart City Genova unique in Italy:

It is based on an integrated and holistic approach: the city is seen as a whole rather than as a set of parts. All the available data, whether produced by existing systems or by new ad-hoc systems, contribute to the training of forecasting and simulation models realised using the most modern Artificial Intelligence technologies applied to the processing of large volumes of data.

It brings to Genoa the unparalleled experience of the Autostrade per l'Italia Group in advanced Control Rooms, IoT for traffic and toll management, digital twin of critical infrastructures, vehicle-infrastructure communication.

It is open to the integration of existing data and application modules, with the utmost attention to the world of research and the enhancement of local skills and the territorial impact of the project.

Being at the heart of the Smart City System, the platform represents the core of the data-driven approach because it creates a digital model of the city that acquires and connects data also in real-time, building the digital heritage of the Smart City of Genoa. Data correlation makes it possible to build customised indices of the city's 'status' that administrators and citizens can assess in real time.

The city's digital twin is provided to administrators in different operating modes, in highly technological Control Rooms in which the tools provided by the platform enable processes of attention to the occurrence of situations and/or alert scenarios and short-term forecasting tools to support the management of critical phenomena and decision-making.

Among the main innovative functions offered by the Smart City System:

The control and monitoring of access and transit to dynamically apply city mobility management policies using all available data on transits and traffic flows in/out and through the urban area.

The city's multi-modal and multi-system mobility model that provides the citizen with a tool to understand the most sustainable way to get from A to B considering all systems that impact mobility (private mobility, local public transport, last-mile logistics) and measuring the reduction of CO_2 emissions depending on the chosen mode of travel.

The forecast of overall sustainability impacts resulting from the opening of construction sites and decisions to redirect mobility flows.

The use of AI for image processing updates the availability of free spaces in public parking areas in real time and in a non-invasive manner. The citizen can be informed with existing tools (e.g. panels) and Smart Road information channels (City-To-Citizen communication)

The presence of tracking gates encourages the safe use of soft mobility, guaranteed by surveillance in the city's Control Rooms.

With vehicle tracking and anonymous data sharing, vertical integration between fleet managers and vehicle drivers and horizontal integration with logistics companies is enabled, reducing inefficiencies, improving workflows and limiting congestion phenomena, typical of last-mile distribution of goods.

Smart or adaptive traffic light regulation uses artificial intelligence to process traffic data in real time and implement prioritisation policies that improve traffic fluidity, reduce waiting times, increase road safety and provide fast responses to previously 'unpredictable' events.

By bringing Smart Road technologies from the motorway to the city, the Smart City prepares for the distribution of connected vehicles and communicates information to citizens when needed.

The programme pays special attention to maximising synergies between project areas and in particular with freight transport logistics, which is particularly important in Genoa due to the close presence of the motorway and the port. The intention is to create an ecosystem in the area that offers several functions, all managed within the same platform, introducing additional functions, such as the Digital Motorway Corridor, supported by the new buffer areas on the motorway routes converging towards the Ligurian ports, which knows and forecasts the flows of heavy vehicles and enables the definition of policies for scheduling access to the port gates.