Success Story

Patras: A smart city safeguarding its environment with Libelium technology

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As the primary urban hub and port for Western Greece, the city of Patras faces the ongoing challenge of balancing its growth with the vital need to protect its natural environment.
As a major port city, it contends with three main risks:

- Impact of the port: The Gulf of Patras, which connects to the Gulf of Corinth, experiences significant maritime traffic. This level of activity brings inherent risks of pollution from accidental spills, ballast water discharge, and general port operations. A recent scientific study (September 2025) on oceanographic circulation in the gulfs highlighted the complexity of the currents, meaning any pollutant could be dispersed unpredictably, affecting a wide area.
- Urban and agricultural impact: Like many coastal cities, Patras is vulnerable to urban runoff. After heavy rainfall, pollutants from the streets—such as hydrocarbons,

Patras has the challenges of any tourist port city

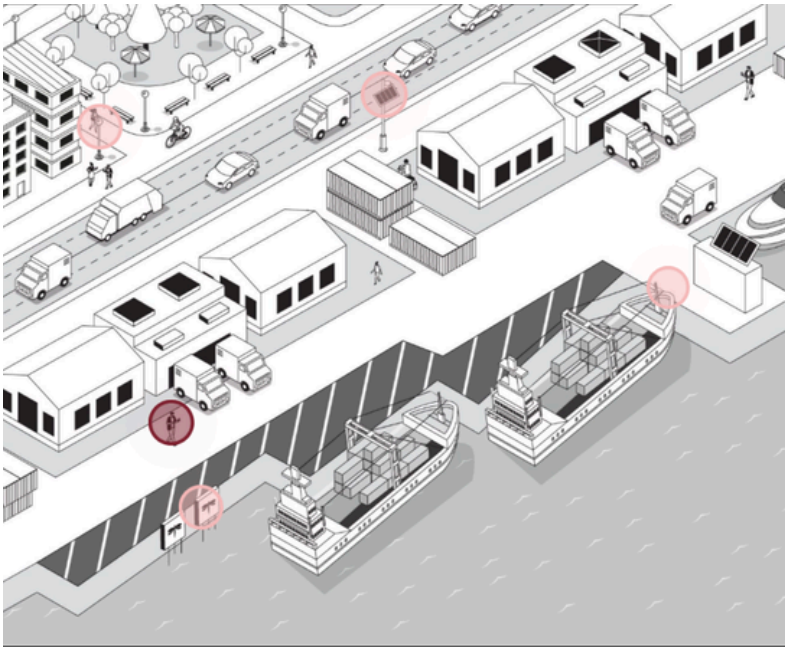
heavy metals, and litter—can be washed directly into the sea. Furthermore, agricultural activity in the surrounding areas contributes to coastal water pollution through fertiliser and pesticide runoff.

- Impact of tourism: Tourism, particularly during the high season, swells the coastal population. This places immense pressure on solid waste and wastewater management systems. It also dramatically increases water consumption, a resource that can be scarce, especially during the dry summer months.

To proactively tackle pollution and ensure the quality of its popular bathing waters, the Patras municipality opted for a comprehensive technological solution for real-time environmental monitoring.

Protecting, managing and growing sustainably

Patras was at a complex crossroads. On one hand, the pressures of being a major transport hub and urban centre brought environmental risks. Air pollution in high-traffic areas and the water quality along its extensive coastline were constant concerns, yet the city lacked the real-time data needed for proactive management. The core challenge was clear: how to balance economic and touristic development with environmental protection and an improved quality of life for its citizens? Patras needed a solution that would provide a clear, real-time overview of its urban and coastal ecosystem.



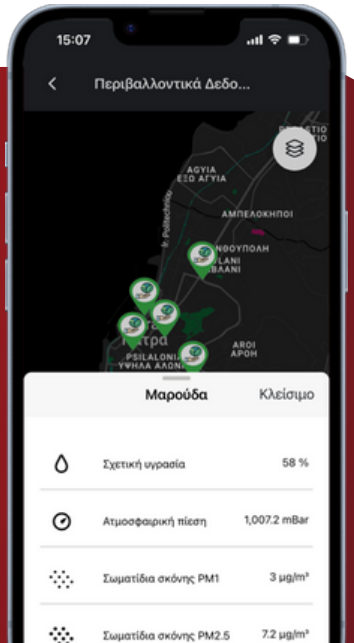
A comprehensive monitoring ecosystem

The solution was implemented bySAMMY PC, a company specialised in smart Port and Maritime technologies and services, acting along with Dotsoft S.A. as subcontractors of NOVA-ICT. The whole initiative is part of the ''Smart City'' strategic plan of the Municipality of Patras and it is financed by the RRF Programme – Greece 2.0.

Within the project framework, SAMMY deployed a comprehensive IoT platform built on Libelium's technology, which consists of two coordinated subsystems:

All the data gathered by both subsystems is centralised on a cloud platform, which processes it and makes it accessible through various tools:

- A mobile app for citizens and tourists to check the data in real-time.
- A map-based platform that visualises pollution levels across the city.
- An automated mechanism for generating statistical reports and distributing data in an open data format.



1. Urban and coastal environmental monitoring subsystem: A distributed network of environmental monitoring stations was installed to collect key data:

- Air quality monitoring: Located at high-traffic nodes and in outlying areas, these stations measure gaseous pollutants (NO2, NO, CO, O3) and particulate matter (PM1, PM2.5, PM10), as well as noise levels.
- Meteorological monitoring: Air temperature, relative humidity, wind speed and direction, atmospheric pressure, and precipitation.
- Water quality monitoring: Deployed at the municipality's beaches, these stations monitor real-time physicochemical water parameters such as pH, oxidation-reduction potential (ORP), turbidity, dissolved oxygen, salinity, and temperature.

2. Seafront monitoring subsystem: A dedicated infrastructure was implemented for the smart management of the Patras marina:

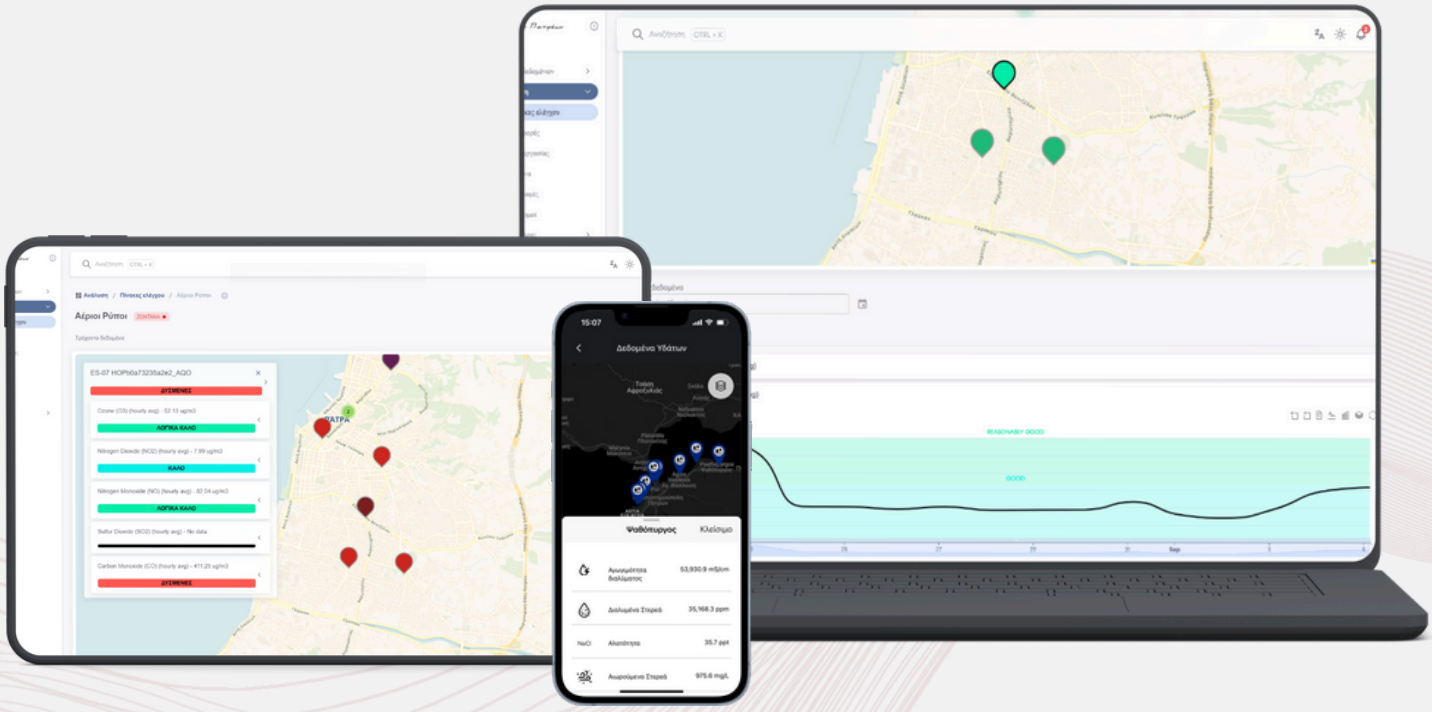
- Vessel flow: Using smart cameras and artificial intelligence (AI) algorithms, the system identifies and logs the entry and exit of boats, enabling the efficient management of berths.
- Environmental sensors in the marina: Installed to measure the local environmental footprint, recording air quality, noise levels, and water quality directly within the port area.

Outcomes and impact

While Patras may not currently be facing an acute pollution crisis, this environmental monitoring project is an invaluable strategic and preventative tool. The implementation of this platform has equipped the Municipality of Patras with powerful tools for more efficient and transparent governance.

- **Data-driven governance:** Municipal managers now have a precise and continuous overview of the city's environmental status, facilitating strategic decision-making on mobility and environmental policy.
- **Enhanced public services:** Real-time information on bathing water quality enhances public health and safety, improving the experience for both residents and tourists.
- **Transparency and citizen engagement:** The mobile app empowers citizens by giving them direct access to environmental information relevant to their daily lives, fostering greater environmental awareness.

This project, developed by SAMMY with Libelium technology, positions Patras as a benchmark in the use of IoT technology to build a more sustainable, secure, and resilient city.



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Beyond the challenge.