

Success story

**Crowd Monitoring on Beaches is
Saving a Maltese Paradise**



Technology to meet tourism and sustainability

This is Ramla tal-Mixquqa, better known as Golden Bay, one of the crown jewels of Malta. Located on the island's northwest coast, this corner of paradise is not just a top tourist destination but also a protected area under **Europe's Natura 2000 network**, which safeguards unique habitats and endangered species across the continent.

But its beauty is also its greatest challenge. With millions of visitors annually, Malta's beaches face immense pressure, especially during peak season.

The key lay in objective data that could inform smart decisions and enable effective beach crowd control.



Sustainable Tourism: A strategic need for Malta

Tourism is a major economic pillar for Malta, accounting for over 25% of its GDP. However, the official "**Sustainable Tourism Strategy for the Maltese Islands 2021–2030**" report warns that the country's biggest challenge is balancing tourism growth with environmental sustainability.

The document highlights the urgent need to:

- Establish carrying capacity limits in sensitive areas like beaches and natural parks.
- Implement smart beach technology to measure and manage tourist flows.
- Develop indicators to assess the impact of tourism in real time.

In this context, the project at Golden Bay is **a national pioneer: the first long-term crowd monitoring program on a protected beach in Malta.**

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Why is it important to count people on the beach?

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Malta as a vacation destination falls into the so-called coastal conservation destinations.

This means:

- It has high concentrations of tourists in small areas (up to 8,000 people/km²).
- It has limited sustainability maturity, with a lack of structural measures.
- And it is economically dependent on tourism, which in Malta's case exceeds 25% of GDP.

Monitoring influxes **is not just a matter of numbers.** It is a fundamental tool for:

- Assessing the real tourist pressure on the ecosystem.
- Designing adaptive conservation strategies.
- Implement dynamic management measures, such as limiting access, distributing flows, or issuing saturation alerts.
- Optimize public resources: cleaning, lifeguarding, transportation, etc.
- Better understand visitor behavior: when they arrive, how long they stay, where they move.
- All of this is part of a broader approach to environmental digital twins, which digitally replicate physical environments for intelligent monitoring and management.



The solution: Smart Crowd monitoring for the beach

Making complex decisions, like those required at Ramla tal-Mixquqa, is impossible without precise data. But how do you efficiently and non-intrusively count thousands of people on a beach?

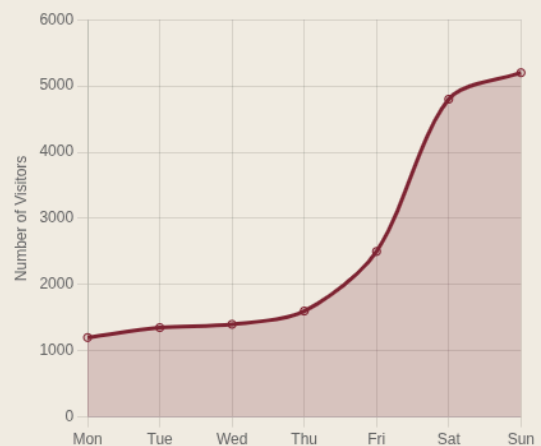
The answer came from a **collaboration between the Maltese government (through the MRDDf) and the managers of the Majjistral Nature and History Park**. They deployed Libelium's Smart Spot technology, a tech solution designed specifically for this challenge, as part of the European project TOURISMO (INTERREG Euro-MED).

The core of the system is a set of discreet, **rugged units housed in flame-resistant and anti-vandalism enclosures**, making them ideal for outdoor public spaces. These devices work by **detecting devices with active WiFi or Bluetooth interfaces**, such as phones, tablets, and wearables. Crucially, the system is fully **GDPR compliant**.

With two types of antennas, depending on the use case, the solution provides data to observe the crowd movement in real-time.



Typical Weekly Visitor Flow



Data is already making an impact

Although the project is still in its early stages, it is already yielding valuable results. The management team can now see clear **occupancy patterns and correlate visitor peaks** with public holidays or even weather conditions.

This connection with the weather is no coincidence.

The Smart Spot is designed to be expandable and can be integrated with additional environmental sensors, such as those for measuring temperature, humidity, and wind speed. This capability provides a **much richer context, allowing managers to anticipate** high-traffic system is designed to be days based on weather forecasts.

This data-driven approach to tourist flow management will help them:

- **Rebalance demand:** By promoting visits during the off-season (autumn/winter) and highlighting new points of interest to relieve pressure on the most popular spots.
- **Drive local transformation:** By collaborating with local businesses on creating a more regenerative and sustainable tourism model.
- **Apply dynamic capacity limits:** By setting daily visitor caps or differentiated tourist fees that vary with demand, allowing for proactive beach crowd control.

The Future is a Digital Twin



Real World

Physical environment with sensors.

Live Data

Data flows from sensors to the platform

Digital Twin

A virtual replica for analysis and simulation.

Better Policies

Test strategies virtually to create a better reality.



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