

Spanish port becomes global 'smart city' laboratory

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A digital panel informs motorists of available parking spaces in Santander

In Spain's historic port of Santander, parking is no longer a headache, rubbish bins never overflow and grass is watered only when needed since this northern resort town became a testing ground for "smart cities" around the world.

Thousands of sensors have transformed the metropolis, known for the grand hotels and high-end casinos lining its beach on Spain's northern Atlantic coast, into a high-tech laboratory.

Four hundred alone are buried beneath streets in the city's busy heart to monitor whether parking spots are free or occupied.

Light panels at intersections and GPS devices direct drivers to the nearest available parking spaces, reducing traffic congestion.

"An app allows you to pay for the parking with your smartphone and when the time runs out, you can extend it directly without having to go down to the street to put more coins in the meter," said Cristina Munoz, a 32-year-old journalist.

When Luis Munoz, an IT professor at the University of Cantabria, pitched the idea of creating a "smart city" to Santander officials back in 2009, he remembers the first thing they told him: "We have a huge problem with parking".

Seven years later, Santander, with some 175,000 residents, is a kind of living laboratory.

With funding from the European Commission and a handful of foreign universities, around 20,000 sensors are up, down and all around—under the asphalt, affixed to street lamps and riding on top of city buses.



A resident uses a mobile phone to read a QR code on a public bus stop in Santander

The devices, about the size of a shoebox with four antennae, collect data on rainfall and road traffic which is sent to a control centre to help the city provide services more efficiently and cheaply.

The pilot project has made Santander the most connected city in Europe "in terms of installed infrastructure", said Munoz, and has even peaked foreign curiosity. On a recent day, the professor welcomed a delegation from Singapore that wants to share in the Spanish city's experience.

Other cities such as Boston in the United States and Aarhus in Denmark have also shown interest in working with Santander.

The city is taking part in a dozen international projects whose results are

being closely monitored at a time when cities across the world, such as London and Tel Aviv, are deploying IT to deliver services.



A QR code is pictured on a public bus stop as a cyclist rides past in the northern Spanish city of Santander

Intelligent streetlights

Sensors installed in bins for inorganic waste warn when they are full and ready to be collected.

The city receives 180 days of rainfall per year and the sensors ensure the automatic irrigation system in public parks only starts working when the soil is dry.

Santander will soon use sensors to ensure that its elegant wrought-iron streetlights reduce the light they emit when no one is nearby.



A tourist uses a mobile phone app to look for information about the northern Spanish city of Santander

With a perennial smile, 49-year-old Angel Benito tweaks the display in the window of his shoe shop on one of Santander's main pedestrian thoroughfares.

On the glass is a QR barcode which can be scanned by a smartphone to provide information about the shop along with a link to its online sales page.

Back in 2012, he was the first shopkeeper to display such a code. Now

there are 1,500 throughout the city.

"Customers can learn about our opening hours, our products, special offers," he said of the system which even allowed him to take an order from a tourist who visited Santander on a Sunday when the shop was closed.

A smartphone app allows residents and tourists to find shops, libraries, medical centres and transportation.



Angel Benito was the first shopkeeper to display a QR barcode that can be scanned by a smartphone to provide information about the shop along with a link to its online sales page

Another provides residents information about their water consumption in

real time and sends an alert to their phone if there is a leak.

Residents creating apps

Santander Mayor Inigo de la Serna acknowledges that the sensors raise concerns about privacy and the risk of cyber-attacks, but he said the goal is to further develop the system.

"There is a data protection law which we must follow and that is a guarantee," he said.

"A smart city is one where if anything happens, all services start to act automatically. For example, if there is a crack in the pavement, a smart city should boost lighting on that street, send an alarm to locals and automatically detour traffic," he said.

The University of Cantabria holds regular meetings with local residents to hear their ideas for apps and also helps put them into practice.

It helped a pregnant woman create an app that outlines the easiest route for someone with a baby buggy, for example.

But most of the city's residents are unaware of the extent of the technological innovations in this ancient port.

Some only use the app which lets them know when the bus arrives. Others don't even use that.

"They have to make it better known, I had no idea, and older people who use buses more also don't know," said Marina Garcia, a 19-year-old student as she waited at a bus stop with her grandmother.

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