



LIVERPOOL'S STRENGTHS HELP REDUCE POLLUTION AND GET SMART

A global port city with a strong history in manufacturing, the City of Liverpool is at the start of its journey to develop a smart city platform. An important part of this strategy includes reducing carbon emissions and harmful air pollution.

"We've long held ambitions that Liverpool should be a place where people can experiment and treat the city as a place to innovate," says Counselor James Noakes, Assistant Mayor for Energy and Smart City.

The city is using tools from TM Forum including the [City as a Platform Manifesto](#), [CurateFx](#) and [proof-of-concept Catalyst projects](#) to take a structured approach to building a smart city platform. The structure these tools provide is essential, Noakes says.

During Smart City InFocus, he and Professor Paul Morrissey, Chair of [Smart Liverpool](#), discussed how Liverpool is

undertaking low-carbon initiatives to support urban regeneration, and the city's approach to becoming smart.

Assessing the environmental threat

The City of Liverpool sits at the center of the UK's second largest regional economy with access to 6 million customers. The economy, supported by 266,000 businesses, is worth an estimated £149 billion (\$197 billion).

"We're strongly connected to global markets," Noakes says. "We're famous for our iconic river [the Mersey], our windswept coastline and international manufacturers. We're known as a global gateway to the Atlantic and beyond."

Liverpool at a glance

Past: Was a major slaving port in the second half of the 18th century, which laid the foundations for the prosperity of the dock and the city – this bleak part of the city's history is commemorated in the International Slavery Museum.

City of firsts – new means of mass transport, ways of harnessing and distributing services, and construction techniques; hometown of The Beatles and many other 1960's music icons

Present: UK's second-largest economy (after London) worth an estimated £149 billion (\$197 billion)

Future: Developing a smart city platform to improve quality of life, in many dimensions, for citizens

But the city's rich manufacturing and trade history has also had serious consequences for the environment and the city's prosperity. During the 1970s, changing global patterns of trade and economic decline led to environmental challenges including contamination, siltation, dereliction of whole neighborhoods and social deprivation. Liverpool sought to address these during the 1980s through a series of governmental programs executed in conjunction with private sector companies.

Carbon reduction has become a key priority, with reductions coming from a mix of new technologies, materials, practices and applications, according to Noakes.

"There is a large volume of technology transfer from sectors such as materials, smart systems and sensors, and energy generation, transmission and storage," he says. "The Liverpool city region is home to a cluster of companies developing innovative low-carbon vehicle solutions."

The city is also home to world-class low-carbon university research centers including the Logistics Offshore and Marine Research Institute (LOOM), Low Carbon Innovation Hub (LoC), The Stephenson Institute for Renewable Energy and The National Oceanography Centre (NOC). These companies and universities are drawing on the region's natural resources to manage carbon output (see bullet points below).

Harnessing offshore wind

- 1 of 6 designated Centres for Offshore Renewable Engineering (CORE) in the UK and the only one on the west coast
- 270 offshore turbines in Liverpool Bay, including the first deployment of the world's biggest offshore turbines
- 330 offshore turbines in the Southern Irish Sea.
- 1st commercial deployment of next-gen turbines from Mitsubishi Heavy Industries Vestas and Siemens.
- \$6.3 million live marine energy project pipeline

Exploiting the rising tide

- River Mersey has the 2nd highest tidal range in Europe
- Mersey Tidal Power project will deliver annual energy yield of 920 gigawatt – life expectancy of the project = 120 years
- River Mersey is equidistant from 4 other west coast river systems that are suitable for generating tidal energy

Making Liverpool smart

While reducing pollution is an important piece of Liverpool's smart city strategy, it's not the only focus.

"Our approach to developing a smart city encompasses many areas, but we intend to place people at the heart of it," Noakes says.

Improving broadband connectivity is a key goal, along with understanding how to plan for a 5G future. Looking for areas where technology can improve efficiency, working on a platform to make city council and other public service data available, and trying to determine appropriate governance for smart city initiatives are also important goals.

City of Liverpool smart city strategy

"We see the city very much as a lab where people can come and try out technology and approaches," Noakes says.

The city is taking a multi-pronged approach to building its platform including using the [TM Forum Smart City Benchmarking App](#) and participating in Catalyst projects; performing a full city analysis; and coordinating with partners including Smart Liverpool and the Low Carbon Eco Inventory, which is part of the University of Liverpool.

"The TM Forum benchmarking tool has helped us get a better understanding of where we are," Noakes says, adding, however, that it has been difficult to take the exact approach the tool suggests because of challenges in coordinating among all the key players.

Smart Liverpool's Morrissey outlined several key smart city initiatives in Liverpool including:

- **Sensor City**, a collaboration between the city's two main universities, which seeks to develop the next-generation of sensors and related applications.
- **SciTech Daresbury**, which houses one of the UK's supercomputers and offers businesses and cities the opportunity to investigate and visualize big data challenges alongside data science.
- **Mobile phone tracking** to understand how people walk around the city center – "We hope this will lead to better decision-making," says Morrissey.
- **Green Wave**, an innovative project to improve traffic flow for emergency response ambulances, altering traffic flows to improve response times and reduce accidents en route.
- **ACORN**, a partnership that brings innovators together with investors and implementers in the city's recently built Children's Hospital, the biggest in northern Europe.
- Participation in TM Forum's Catalyst program [working on a project](#) to address issues and optimize assets around air quality, visitor experience, autonomous vehicles and social services support.

"I'm all about problems, not solutions," Morrissey says. "That's the approach we're taking in Liverpool: We're looking to identify problems, not what we can do with solutions."