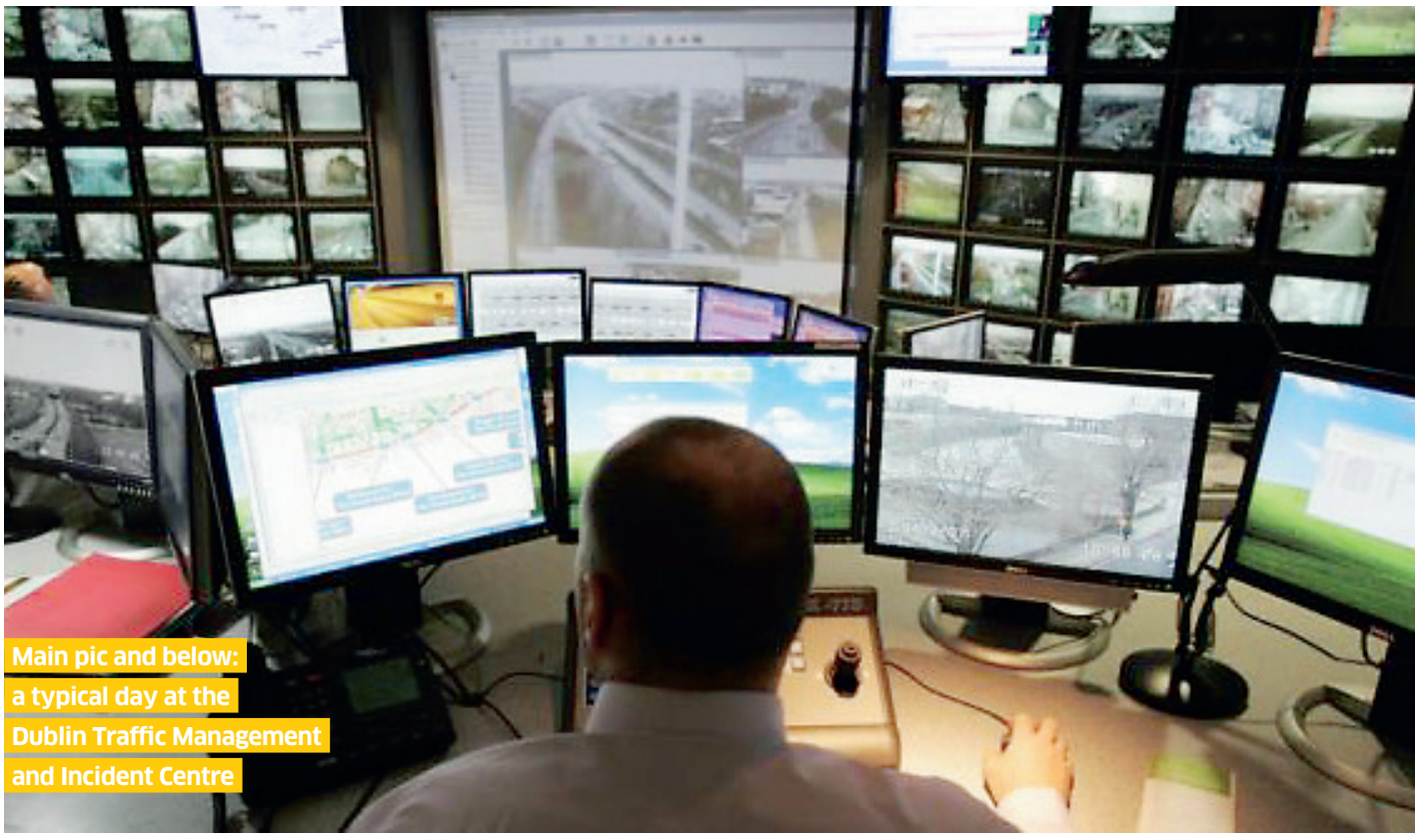
The human side of smart cities

The concept is older and a lot more complex than you might imagine, writes Jane Ruffino



Main pic and below: a typical day at the Dublin Traffic Management and Incident Centre

In Dublin's Civic Offices on Wood Quay, you'll find the Dublin Traffic Management and Incident Centre. In this room, a small team of people operates the buttons and levers that control the city's system of lights and signals. There are 130 CCTV cameras across Dublin monitoring traffic and collecting anonymised data that helps inform human-made decisions about when to override traffic lights, how to change timings to alleviate congestion, and what to communicate to the public about their commute or their community.

It sounds like the cutting-edge backbone of a new smart city initiative, but Dublin has had a traffic control room since 1986. In fact, what we call the 'smart city', which has become shorthand for a technocratic, data-driven approach to urban planning and management, isn't new.

"The smartphone has been the big leap forward, along with wider-scale big data, and the lower cost of computation and data storage," says Rob Kitchin, Professor of Human Geography at NUI Maynooth. "But some of this is old technology; we've been putting computation into cities for quite a long time."

It's not just traffic management. In the 1960s, Los Angeles established its Community Analysis Bureau, which used aerial photography, cluster analysis and databases to try to tackle some of the city's social inequality, believing that computation-led research could strip away the biases of qualitative approaches.

When we talk about smart cities, the focus is often on sensors, cameras, and automation, which makes it easy to think of cities as efficiency-driven machines, and data as an objective way to get there.

"You tend to assume the data is neutral," says Kitchin, "but cities are complicated and messy, and full of problems and competing interests."

Many of the issues addressed by smart city initiatives are what Kitchin calls 'instrumental', things like waste collection, traffic management, flood prevention. And when problems with tech-driven solutions are raised, they tend to be about system security. Malware has taken down Ukrainian power grids more than once, and the WannaCry ransomware attack is still wreaking havoc on traffic, service and business infrastructure.

But in addition to security needs, what about the deeper question: what kind of city do we want to live in? What happens when we accept that data is defined, collected, and acted on by complex, messy humans, on other complex, messy humans?

Even purely instrumental approaches come with baked-in biases.

In 2011, the city of Boston released an app called StreetBump, which used GPS and accelerometers to automatically log and report bumps and potholes in the road system as users drove around the city. It was phenomenally successful, but mainly in neighborhoods where drivers had smartphones, which meant socioeconomically disadvantaged areas were less well served by road improvement services. But the city responded. They gave the app to city workers, too, since they covered all neighborhoods, and it allowed them to collect more complete data.

Without considering who a city is really for, the smart city could wade into what Kelsey Finch, Policy Counsel at the Future of Privacy Forum in Washington, DC, calls 'the metropticon', the often unintentional impact of uncritical technocratic approaches, taken to their extreme. "It's where you have a tech-driven city, but in a way where decisions are made, and citizens don't have input or insights into why they happen," she says. "Using all of this data can benefit one population but not another, intentionally or inadvertently. Algorithms are based on historic trends, and those have biases."

In Boston, lower-income areas weren't reflected in the StreetBump data, but sometimes the reverse is true. "Poor and vulnerable populations could end up in the data the most, and end up over-surveilled but not benefiting."

People seeking services to address marginalisation, for example, may end up in a police database, which can lead to revictimisation.

What makes a city smart, then, is the people who make decisions based on a range of inputs, including qualitative knowledge, past policy decisions, and the citizens who should be full participants in the process of shaping a city that serves everyone.

"Cities are getting better," says Kitchin, "They got bamboozled at the start and weren't sure what they were buying. Now they're starting to take more control as the buyer, and they're stipulating conditions around the use of tech, including conditions around data use, and things like privacy impact assessments."

Security and privacy are key questions we need to ask about smart cities, along with data storage and reuse. Where else in the city is data collected, who has access to it – and will they sell it to data brokers? Where are the forums for the city's residents to ensure that diverse needs and concerns are heard?

Cities like Barcelona and Amsterdam are frequently cited as examples where there are citizen-led, transparent initiatives that are built around more than efficiency-driven KPIs. Amsterdam has a long history of citizen initiatives, and Barcelona's shift in government since 2015 has allowed for more inclusive discussions and processes.

Kitchin's work on Dublin's smart city initiatives, including the Dublin Dashboard, is as informed by these deeper issues as it is by the need for optimising traffic patterns in a city built for horses, carts, and foot traffic. "We need to address bigger questions: citizenship, democracy, fairness," he says. "What would a smart city formed under ideas around the right to the city, urban commons, participatory planning look like?"

"It's worth pointing out that the data systems have the ability to flatten out cultural differences and diversity in the city, and that's a thing to take caution against," says Finch.

The Dublin traffic control room doesn't save camera footage or collect personally identifiable information, but, for example, how traffic lights prioritise public transport and pedestrians especially affects people who are vulnerable or marginalised.

Tech-smart cities that work do what people smart cities have always done, and truly involve people in the process. "They're making sure people are heard, even if it takes longer," Finch says. "It can be done, and cities are getting there, but it's harder to convince people to do that than to buy a new sensor."