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CASE STUDY

Liverpool City Council Smart Pedestrian Project

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Smart solutions

The SMART Infrastructure Facility is one of the largest research institutions in the world. Dedicated to helping governments and industry plan for the future, we're constantly working to find solutions to a whole range of complex urban challenges.

It's not disputed that one of the most pressing issues in our metropolitan environment is the rise and negative impact of traffic congestion. Encouraging people out of their cars and making our cities more workable and walkable, is a project we've been working on with Liverpool City Council.

THE BENEFITS OF A WALKABLE CITY

The reasons to encourage increased pedestrian movement in our cities are both amazingly varied and incredibly positive. Benefits of a walkable city include:

- More pedestrians mean less people travelling by car, which in turn means less congestion and a wide range of environmental benefits.
- By making walking (and cycling) a default form of transport, people have healthier lifestyles, reducing the impact and cost on ancillary health services.
- Promoting walkability addresses issues such as sustainable development and resilience to climate change, and creates a more liveable and enjoyable city, encouraging inclusiveness and sociability.

THE LIVERPOOL CITY FOCUS

Liverpool City Council is one of the first local councils in Australia to actively search for solutions to congestion and pedestrian movement within their CBD via the use of smart technology. Implementing a program that examines the behavioural characteristics of traffic and pedestrians at key locations within Liverpool CBD, they are creating the baseline to design the future movement of their city.

A TEAM OF PARTNERS

The Liverpool City Council Smart Pedestrian Project is a research collaboration between SMART, Liverpool City Council and industry partner Meshed. The project was conducted over a one year period from March 2018 to March 2019, and funded by a federal Smart Cities and Suburbs grant.

The project uses smart technology, via a smart sensor, and open data for the real-time measurement of pedestrian movement. In identifying movement patterns (such as where and when congestion is heaviest and the number of pedestrians present at a certain place and time), the data will support the future evidence-based decisions around the urban street design in Liverpool.

STRENGTH IN COMMUNITY CONSULTATION

Essential to the successful implementation of the project was the involvement of the community of Liverpool. SMART held stakeholder engagement and consultation workshops aimed at raising awareness, identifying concerns and highlighting the benefits of the project. Using gamification techniques to generate a diverse range of opinions, participants raised concerns around a variety of different topics as well as the initial traffic congestion topic.

The lack of diverse activities and feelings of insecurity at night within the CBD were both underscored as concerns, while there was strong advocacy for a walkable 'campus' city, the revitalisation of the riverbanks and green spaces, and encouraging a youth-friendly city.

HOW THE SMART SENSOR WORKS

With the objectives of the workshops front of mind, key locations were mapped out where the smart sensors should be deployed in order to gather the most relevant data. People, bicycles, motorbikes, trucks, cars and buses are tracked using a smart visual sensor. This sensor uses a combination of existing CCTV, image recognition, smart device counting, Wi-Fi and digital networking technology, to send a signal over the Internet, identifying the spatial positioning of each moving object.

Developed by SMART, the smart visual sensor detects and tracks the moving people and vehicles in a live video feed using video analytics. This video feed is run directly on the sensor device and only the resulting 'frames' are transmitted.

Because of the limited information transmitted via IoT, the data is entirely privacy compliant and allows for this real-time tracking without the possibility of personal identification. The sensor, or 'smart camera', can be standalone or attached to existing street infrastructure and CCTV cameras.

Integrated into the smart sensors as well as the Liverpool CCTV network, was a machine learning algorithm that detects, frames, differentiates and tracks the objects. This machine learning, an application of artificial intelligence, automatically learns from the ongoing experience, enabling the analysis of vast amounts of data without human assistance.

VALUABLE INFORMATION FROM SMART DATA

The data from the smart sensors (pictured below) measures traffic and pedestrian movement, as well as monitoring air quality, combining to paint a picture of how Liverpool works. In creating this picture we're able to benchmark where we are now and more importantly, gather evidence for an urban transformation that will enhance the lives of the residents and visitors of Liverpool.

Through the cutting-edge development and implementation of smart technology we're able to build a collaborative, connected and responsive city. In redesigning the relationship between pedestrians and traffic and creating a model for partnership, community engagement and a more liveable urban environment, SMART and Liverpool City Council are one step closer to a more walkable Liverpool.