



**SMART  
CITIES  
REPORT**

an update on  
**BIGPROJECT**

**THE INTERNET OF THINGS**  
EXAMINING HOW THE INTERNET OF THINGS  
IS CHANGING OUR LIVES FOR THE BETTER

**SMART TRANSPORTATION**  
HOW THE GCC IS IMPLEMENTING SMART  
TECHNOLOGY ACROSS ITS TRANSPORT NETWORKS

# TECHNOLOGY MARCHES ON

With technology evolving rapidly,  
the region's smart city plans take shape

**AECOM**

**Integrating IoT into the urban environment**  
There are numerous opportunities to change experiences in public spaces using the Internet of Things.



## THE FUTURE OF THINGS

Jason Lewis, managing director and founder, Limah Design Consultants, explains how the Internet of Things is changing public spaces to create positive user experiences

The Internet of Things (IoT) is in essence a future with every object, natural or man-made – our buildings, our homes, even our bodies – communicating data in real-time. The challenge for developers of the future will be to harness this data in meaningful ways, to understand users' needs, wants and desires, to tailor user experiences to user behaviours and ultimately keep users coming back.

With most of our time spent either in the workplace or public spaces, there are numerous opportunities to change these spaces through the IoT. The

data gathered will help us to ease movement and navigation, improve security, increase economic activity and create customised user experiences. Our challenge in our work at Limah, a design consulting firm focused on user experience and way finding, is to research, propose and implement meaningful ways to include the IoT and its applications. When we think of a public space from purely a user's point of view, we can uncover numerous opportunities to grab their attention, attend to their needs and make a

positive impact on their lives. Our projects have provided such opportunities. Below are a few examples of how public spaces will be changed by the IoT, making them more useful, usable and enjoyable environments.

### Smart parking

For the majority of us living in urban areas, we have nearly the daily problem of finding parking. While future public transit is sure to improve and become more efficient, the car will remain the primary mode of transport. While self-driving cars have a

place in our future, they will still need a place to park. Parking has always been a dreaded part of any trip into a dense urban neighbourhood. Smart parking apps already in development and use in some cities allow drivers to find parking quickly and efficiently rather than circling the block endlessly in search of an open spot. Not only will this reduce fuel consumption, it will of course alleviate much of the stress that goes along with the search.

### Inside Car Parks

Once inside car parks, for

example in retail spaces, opportunities exist to guide drivers to open spaces or assign them at entry, thereby reducing the frustration and time of search for spots. Once parked, connect this information to your mobile, and not only can you remember where you parked, but order a carwash or a key drop, or have your shopping bags delivered to your car while you continue to shop. Your space information and car details will be connected to the mall's security and management. Find yourself at the retail opposite end of the mall and have your car delivered to the nearest entrance.

### Navigating the Public Space

Most buildings and public spaces today rely on signage to guide users. While signage is likely to always have a place in identification of doors, spaces and places, the way in which we navigate to them will likely be improved upon greatly. While mobile apps have begun to appear in public spaces, they are quite primitive at this stage, merely mobile versions of websites with branded messages. Future mobile apps and devices will become necessary tools in navigation. Looking for the washrooms? Merely select an icon which points you in the right direction. Have a question? Select the information icon and be connected to customer service instantly.

As GPS technology becomes more precise across wireless buildings, exact locations can be found even across multi-storey buildings, again alleviating stress and frustration. These devices and apps can cover all of the principles of way finding: to orient, to direct, to inform, to welcome, to create a positive experience.



*"For developers, access to user data and movements will be invaluable. Tracking movement of all users within a space will give insight into opportunities for positioning of retail outlets and promotional stands, and finding ways to push users to areas less travelled"*

**User Experience in the Public Space**

The buildings of today and the future, to be successful, will go beyond form and materials. To be successful, they will need to make personal connections to the user. To make the user feel connected to the space, they will need to become part of the environment and make an impact on it. Developers will be able to gain valuable insights into users based on their behaviour. Again taking retail spaces as an example, the IoT will provide retailers with opportunities to track purchases, demographics and historical data on every user.

This data being tracked in real time across a mall environment would allow retailers to target specific customers to encourage repeat business. How about a sale on shirts similar to what you bought last time specific only to you, or your favourite

*“As GPS technology becomes more precise across wireless in buildings, exact locations can be found even across multi-storey buildings, alleviating stress”*

car? Let's face it, you're back with a free coffee, knowing that you are in the neighbourhood! We have seen it in the movies, but soon technology will allow advertising across digital platforms to change based on proximity demographics, making advertising more effective. No more elevator music – when you enter a lift, it will play music from your preferred genre and artists. With future wearable devices monitoring your body's critical data, these can alert you to even what kind of food, macro-nutrients or hydration would be best for you at this moment, and it just so happens a nearby restaurant has that on the menu.

For developers, access to user data and movements will be invaluable. Tracking movement of all users within a space will give insight into opportunities for positioning of retail outlets and

promotional stands, and finding ways to push users to areas less travelled. In case of emergency, knowing the total number of users and their exact locations could be life-saving in natural disasters or security threats.

While much of this technology exists, it will take more time for it to become cost-effective and for developers to be able to collect and analyse the data effectively. Further, for the public to embrace these technologies, security and privacy of personal data will need to be ensured.

Ultimately, the IoT in the public space will provide two critical pieces of information: data on every user in the space, and information on ways to improve those users' experiences to become more positive, making them want to return and tell others of their positive experience. ■



**Smart parking**  
In retail spaces, customers can be guided to free parking spaces or assigned a particular spot using the IoT