





# THE Internet of Things AND THE Future of Parking

BY BILL SMITH, APR

**Y**OU MAY NOT HAVE HEARD OF THE INTERNET OF THINGS (IOT), or perhaps you've heard of it but aren't really sure what it is. If you aren't familiar with the IoT, it's time to acquaint yourself with the topic because chances are it's already affecting your day-to-day life.

The IoT is the system of internet connectivity through which technologies and the devices we use in our everyday lives are connected online so they can interact with each other and be controlled remotely. So, if you use a smart thermostat or web-enabled security systems or remotely controllable doors (just to name a few common devices), you are already using the IoT. Go ahead, pat yourself on the back because you are officially an IoT trendsetter.

The IoT is already transforming our personal lives, and that lifestyle trend is accelerating dramatically. It won't be long before we are all

constantly in contact with our homes, vehicles, and other elements of our lives (sadly, this includes the office).

### **Taking Control of Mobility**

The IoT is having just as significant an effect on the parking industry. Many of the most important technologies that have been introduced in recent years offer internet connectivity. As a result, they allow parkers, and parking owners and operators as well, to instantly access parking resources from any computer or smartphone.

“Online connectivity has become very important in recent years,” says Dan Kupferman, CAPP, director of car park management systems for Walker Consultants. “Many new connected technologies have been introduced to make the parking experience much more convenient for drivers and more manageable for owners and operators.”

The most recognizable IoT-enabled parking technology is the mobile payment app. During the past decade, a number of apps have been introduced that permit drivers to pay for parking on their smartphones from the convenience of their vehicles.

“Look at how technology impacts your day-to-day life,” says Roamy Valera, CAPP, CEO, Canada and U.S. for PayByPhone. “We already manage so many aspects of our day-to-day lives with our smartphones, iPads, and laptops. When it comes to mobility, parking provides the introduction to the IoT.”

“The IoT and mobility start with you and your phone,” continues Valera. “Think about how much better the parking experience is when we apply these concepts to parking. Drivers can pay with their phones, keep track of how much time is left on the parking session, and add more time remotely. When you can manage your parking session with your personal phone you can take control over your journey.”

The IoT’s impact on parking can even begin before the driver leaves the house. Parking pre-booking platforms allow drivers to reserve a space before they set out on the journey. Rather than having to search for a space when they arrive at their destination, drivers can just go online, input a payment credential, and reserve a space. Some parking facilities even let you reserve specific spaces online.

“For many people, parking can be a stressful experience,” says Theresa Hughes, CEO of Chantry, Ltd. “That stress can be significantly reduced by providing access to a parking space before the driver even leaves home. Garages offering pre-booking technology essentially allow patrons to connect with them from home, ensuring they’ll have a place to park when they arrive. Pre-booking platforms also allow them to enter their payment credentials in advance, which means they

don’t have to fumble for a credit card or cash when it’s time to leave.”

When you can reserve parking and manage your parking session in advance, you have another way to take control of your mobility.

Kupferman agrees that pre-booking is a vital element of IoT-driven parking: “Owners are starting to sell parking like entertainment venues sell tickets. That trend will only grow in the coming years.”

## **IoT Benefits Owners and Operators Too**

As many industries have already discovered, the IoT can offer extraordinary benefits to companies as well. That includes parking owners and operators. Connectivity provides tremendous management advantages that benefit owners and operators, as well as patrons.

“When parking equipment is always connected it’s possible to complete management tasks from anywhere, anytime,” says Waldemar Batistella, national product portfolio manager, SKI-DATA. “For instance, owners and operators can manage their contract parkers online from anywhere. They can also view detailed data on their operation, as well as the status of equipment. Some owners even use connected technology to remotely manage their garages. Today, owners and

operators don’t need to have a physical presence within the parking facility to keep it operating smoothly.”

Selim Esen, CEO and chief technology officer of AVPM, says the remote monitoring benefits of the IoT are significant. “The IoT allows owners to constantly monitor the performance of their equipment,” he says. “PARCS and other types of parking equipment often include monitoring software that allows clients to control their parking assets wherever they are, from nearly anywhere. They can manage their machines, processes, and systems to control costs and help increase safety and improve customer satisfaction.”

According to Esen, by monitoring performance in real time, not only can owners and operators identify problems when they happen, but they can also often anticipate issues before they occur. That’s because system breakdowns will often be preceded by impaired performance; when that happens, remote fixes can often be implemented.

**The IoT is already transforming our personal lives, and that lifestyle trend is accelerating dramatically. It won’t be long before we are all constantly in contact with our homes, vehicles, and other elements of our lives (sadly, this includes the office).**

Gorm Tuxen, president of parking software provider IPsens, agrees. And he says that when equipment doesn't come with its own monitoring software, independent monitoring technology can handle the task.

"Independent maintenance software allows streamlining of the preventive system maintenance procedures, allowing problems to be fixed remotely in many cases before dispatching expensive field service personnel," Tuxen says. "It also provides an ongoing history of the performance of the hardware over time. It's sort of like having an independent monitor on hand to make sure everything is working properly."

Parking guidance is also an important part of the IoT. Sensors play a leading role in IoT connectivity in other industries and it stands to reason that they would play just as vital a role for the parking industry.

"Parking guidance technology provides constant two-way communication," says Jake Bezzant, CEO of Parking Sense. "The sensors tell drivers where they can find available parking and at the same time, communicate with owners and operators, telling them which spots are full and when, and providing data about how long parkers occupy their spaces and which spaces are most popular within a structure."

The benefits of this two-way communication are obvious. Drivers benefit by gaining convenient access to available parking while owners collect real-time data they can use to better manage their parking facilities and make informed planning decisions.

Connected parking technology is even making its way to America's highways. Departments of transportation (DOT) in Florida and across the Midwest recently implemented systems combining parking guidance sensors and specialized software to help fatigued truck drivers find the closest available truck stop or rest area parking space.

The programs, which are managed separately by each state's DOT, use parking sensors installed in truck stop and rest area parking spaces to monitor individual space availability and communicate that information to truck drivers via roadside signage and a specialized smartphone app. The systems are managed by a custom-made open source software platform with an application programming interface (API) that connects the system with the apps drivers use to find available parking, allowing drivers to connect with the system no matter where they are. The API can integrate to any network within a state's system and is able to provide real-time data about where parking is available for tired drivers. All drivers have to do

is open the app on their phones and the technology does the rest.

"These programs are already saving lives, and they will become standard equipment on America's highways over the next 10 years," Tuxen says. "The technology allows truck drivers to constantly be connected with servers that can guide them to a safe resting place. Ultimately, as smart cities mature, the same technology will be in our cars and will direct us to the closest available parking space to our downtown destinations."

## Looking to the Future

As important as the IoT already is to our daily lives, it's still in its infancy. As new parking technologies continue to be introduced and added to the grid of connected technologies, garages and vehicles will become more dependent upon them.

"Some of the advances we'll come to rely on in the future are already in place," Bezzant says. "For instance, many parking guidance sensors have Bluetooth chips to facilitate payment. In the future, this same Bluetooth technology will be able to manage reserved parking areas for autonomous vehicles, guide the vehicles to open spaces, and manage the transaction."

According to Kupferman, when it comes to the IoT, the future is limited only by the limits of our imaginations.

"Connectivity offers so much promise for the future of parking, mobility, and transportation," Kupferman says. "When all these connected technologies are tied together, we can build parking transportation suites that ensure a seamless parking experience while constantly collecting incredible amounts of data that can be used to manage parking facilities better.

"And more amazing breakthroughs are right around the corner," he continues. "For instance, roadways can now be built with materials that include sensors and computer chips that can collect immense amounts of data about vehicle and pedestrian patterns. There's even a connected glass road covering that, in addition to recording data, can permit lanes to be realigned in response to utilization patterns identified by its sensors. When it comes to IoT and mobility, the future really is unlimited." ♦



**BILL SMITH**, APR, is principal of Smith-Phillips Strategic Communications and contributing editor of *Parking & Mobility*. He can be reached at [bsmith@smith-phillips.com](mailto:bsmith@smith-phillips.com) or 603.491.4280.