

Smart parking can benefit citizens, businesses and the environment, Julian O’Kelly from the British Parking Association outlines the importance of smart parking solutions



# Smart parking: transforming the experience of parking



**S**mart parking is a term increasingly used by governments, manufacturers and tech developers to cover the many innovations designed to deliver more consistent, user centred and economical parking experiences for drivers. A recent analysis, “Smart Parking Market in Western Europe,” predicts the market for products and services in this field to increase by 14% between 2016 and 2020.

Paul Wessel, director of market development at Parksmart, United States Green Building Council, defines smart parking as: a “parking strategy that combines technology and human innovation in an effort to use as few resources as possible — such as fuel, time, and space — to achieve faster,

easier, and denser parking of vehicles for the majority of time they remain idle.”

## Intelligent solutions

For both parking management and the drivers’ experience of parking to be stress free and intelligent, the technology used for both off and on street parking needs to be sensitive to space, usage and time factors, and this information should be easily communicated to end users. The technology involved in this process includes:

## Digital data

Digital data has been the driver behind most smart parking innovations in the last ten years and now plays a central role in virtually all aspects of parking, particularly in relation to use

of smart phones and developments in connected and automatic vehicle (CAV) technology. To support this development, the British Parking Association (BPA), European Parking Association (EPA) and International Parking Institute have played key roles in establishing the Alliance for Parking Data Standards (APDS) to develop, promote, manage, and maintain a uniform global standard that will allow organisations to share parking data across platforms worldwide. Building on the success of the APDS, the BPA is now turning its attention to developing a consensus based digital standard for traffic regulation orders, which could potentially lead the way internationally in harmonising the digital landscape for CAVs and parking/navigation apps.

## Sensor and camera technology

Using in-ground parking sensors gives parking operators a detailed understanding of occupancy and consumer behaviour across large areas, which could be used to dynamically adjust rates at meters. This can help achieve on-street occupancy rates of up to 60–80%, as illustrated by *SFpark* in the US. Sensors may feature dual-detection magnetic and infrared technology to optimise vehicle detection measuring, as SENSIT systems recently installed in Dubai and Izmir city show. Furthermore, camera/sensor hybrid technology makes it possible to judge the dimensions of cars entering car parks or residential areas and match them to the dimensions of available spaces.

## Self-parking and automated valet parking

Fully automated driverless transportation is far from becoming a reality due to the many technological, regulatory and safety challenges involved in its development. However, in-car sensor and camera technology already allows fully automated parallel parking and remote parking with obvious benefits for disabled drivers, and where space constraints are significant. The next stage of evolution in this field is automated, or cyber valet parking, where drivers can leave cars at drop-off points. The cars will then be able to be driven away, parked, and returned to a pick-up point when drivers are ready to leave.

This system is already being tested in a carpark in Issy-Les-Moulineaux.

## Parking apps

Today, parking apps are as ubiquitous as smart phones and developers offer a range of solutions to ease the congestion and stress involved in searching and paying for parking and helping consumers identify the most economical and time-efficient parking options. At the operator and traffic management level, apps and bespoke software enable managers to realise the full value of both car parks and on street spaces. For example, the Kerb app helps authorities to manage the availability of busy locations, where permissions may be booked and dynamically programmed to correlate with peak demand on kerb space, with knock on benefits to traffic flow.

## Benefits to citizens and businesses

A BPA study of 2,000 drivers found 44% consider parking a stressful experience; we spend an average of four days a year looking for spaces to park. The combination of sophisticated parking apps, intelligent parking management and data integration is set to reduce this frustrating experience. Smart parking offers numerous benefits to citizens and businesses alike; drivers are more likely to visit retail and entertainment places when the hassle of finding spaces is handled by their app or connected vehicle. Parking operators also benefit through more efficient use of their capacity using intelligent management



## Alliance For Parking Data Standards Developing Harmonised Parking Data

Smart parking requires the seamless sharing and integration of data across platforms. Whether related to car-sharing, ride-sharing, prepaid parking, dynamic pricing in parking structures, remote management of operations, and/or improved reporting, the sharing of harmonized data is key to enabling the adoption of these services.

To create that harmonization, the Alliance for Parking Data Standards (APDS) was formed by the BPA, EPA, and IPI. Through the APDS, the three organisations are managing the creation of consensus-built, international parking data standards to establish a common language for data elements and definitions in the parking, transport, and mobility sectors; this will facilitate seamless integration, compatibility, and communication between parking entities, the automotive industry, IT developers, ITS operators, services, and map and app providers, as well as other stakeholders.

An initial draft of the standard covering Data Domains, Parking Place, Rate and Occupancy, Data Model, Use Cases, and Data Dictionary just concluded a public review process. Learn more at [www.allianceforparkingdatastandards.org](http://www.allianceforparkingdatastandards.org).



programmes with dynamic pricing to make the most of the peaks and troughs in demand.

## Benefits to the environment

The *SFpark* initiative (combining intelligent traffic management, dynamic pricing and smart parking solutions by using sensor technology on a large scale) highlights the significant potential of smart parking to benefit the environment. The project reduced the time it took to find spaces (through less circling) by 45%, with a knock-on 30% reduction in vehicle miles driven and greenhouse gas emissions. Operators are also in a key position to integrate additional environmentally friendly options by supporting electric vehicle uptake with increased charge point availability, solar energy adoption and dedicated car-club

bays and promoting these features through the many parking app platforms available.

## The European challenge

Smart parking is part of the growth in smart cities, where city town planners seek to address the challenges posed by increased urbanisation, through sustainable economic development and measures to improve quality of life in relation to mobility, economy, environment, people and government. There are EU efforts to support smart city development, such as the European Innovation Partnership on Smart Cities and Communities bringing together cities, industry, businesses, banks, researcher and others, to engage the public and industry in supporting smart city innovation. The EU's support and finance of *Eltis*, which focuses on urban transport mobility in Europe, has led to the development of new solutions in intelligent parking in Hamburg.

Whilst EU smart city initiatives are important, there is a real need for more focussed attention on parking. The European market is highly fragmented because many companies are active in this area. On one hand, a diverse market is not a bad thing in terms of stimulating innovation through competition, however this scenario poses challenges in terms of impeding growth through issues in network integration and security. A key issue for all EU counties is the battle for the kerbside, which is becoming increasingly acute with the rise in demand for delivery services related to on-line purchasing. Where ownership



of a parking space is in the hands of many different public and private bodies, increased collaboration and harmonisation is needed to overcome obstacles in this complex environment. Initiatives in data harmonisation such as those being developed by the APDS will help address these challenges. Individual countries also need to address specific issues, such as the disparities between public and private regulation of automatic number plate recognition technologies. Open market conditions are needed to support a more seamless experience for customers. Another issue found in the UK and elsewhere is the exclusive tie-in local authorities have to individual mobile payment parking solutions. These pose a headache for consumers needing a different app for each different authority, and stifles competition in the market at the national and international level.

Increased demand for ridesharing options and car clubs pose another interesting challenge for smart

parking. New developments in policy and technology need to adjust to a future where individual car ownership may be replaced by the developing mobility as a service market. That model is arguably even more effective at reducing emissions and improving congestion, but, considering the number of cars that will still need to park, especially during down or waiting times, the effect on parking is still not known.

Obstacles notwithstanding, the smart parking revolution shows no sign of slowing down, and with private and public bodies working together a more intelligent, economic and eco-friendly future beckons.

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