Technology Glossary for Parking Professionals

FIRST EDITION 2017

IPI INTERNATIONAL PARKING INSTITUTE
Advancing the parking profession

BPA BRITISH PARKING ASSOCIATION

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During the past several years, the use of technology has accelerated in the parking and transportation industry. With these advances come new terms and changes to some definitions of terms we thought we knew. This glossary will help you better communicate with your peers, vendors, and the public when discussing parking technology.

Words printed in red are defined elsewhere in this document.

Access Control

Managing the access into and out of a parking facility and usually involves some kind of permit, voucher or other ID to enable access.

Access Control System (ACS)

A system of hardware and/or software that controls access to facilities.

Alarm

Alarms may be used in access control and revenue control systems; these are system-generated messages that indicate potential problems with equipment or operational rules that have been broken (i.e. vehicle entered lane and then backed out).

Alarms may also be generated by users of the parking facility to request help or assistance.

Alternate Side Parking

A traffic regulation that prohibits car parking on one side of the street between certain hours of the day.

Anti-Passback or Passback Control

A setting that requires ACS users to enter and exit in proper sequence with their parking credential (i.e., entry, exit, entry, exit, etc.). Anti-passback is typically selectable as either "hard" or "soft:"

- Hard anti-passback rejects ACS users that are out of sequence, and should be set to send an alarm at the ACS controller and Facility Management System (FMS).
- Soft anti-passback allows out-of-sequence ACS users to enter and exit, but reports and records violations with an alarm at the FMS for follow-up by the parking manager. Soft anti-passback provides a more customer-friendly experience while monitoring for misuse. This setting should be unique for each user.

In both hard and soft modes, each out-of-sequence event is reported as an exception transaction in the daily ACS access log. Many systems have the capability to clear the anti-passback condition via a password-protected resynchronisation of the user's account.

App

A self-contained program or piece of software designed to fulfil a particular purpose; an application, especially as downloaded by a user to a mobile device.

Atomic Clock

An extremely accurate clock in which an electrical oscillator is controlled by the natural vibrations of an atomic or molecular system. Used in many parking systems to ensure accuracy and consistency of time between different systems.

Authoritative Data Source

The system that has ownership of data or processes. Many systems can access the data, but only an authoritative system maintains the original record and controls changes to the data.

EXAMPLE: The Driver and Vehicle Licensing Agency is the authoritative source of vehicle registration marks and keeper records information. A parking operation might use this information but is not allowed to change/alter it because the parking operation is not the authoritative source.

Automatic Number Plate Recognition (ANPR)

A vehicle identification technology that uses cameras to take pictures of number plates, read the images via character recognition software, and converts the images into text that a computer can use. ANPR is common in access control, tolling, and speed management applications.

Automated Pay Station (APS)

Allows for automated ticket processing in central cashiering facilities. It can supplement and/or replace cashiers. Sometimes called a pay-on-foot or pay-on-exit machine. Can accept multiple forms of payment and provide receipts.

Automatic Vehicle Identification (AVI)

A system that enables automatic identification of a vehicle when it enters a parking facility so it can be authorized and permitted to enter and exit. AVI access methods include Radio Frequency Identification, ANPR, and Proximity cards.

Autonomous Vehicle

Vehicles which can drive themselves without human supervision or input. Unmanned vehicles are either controlled remotely, or perhaps operate autonomously. There are various levels of autonomy.

Barcode

An optical, machine-readable representation of data that can be printed on a credential. There are many barcode formats, including Code 39 (3 of 9), Code 128, PDF417, QR, etc.

Barrier

The hardware used to control access to a facility or car park.

Batch

An interface that collects data for periodic updates versus providing a real-time stream of data.

Bay Sensor

Sensors that are placed in the ground on a lane or level of a facility to detect a vehicle passing overhead. They track occupancy by identifying the presence of a metal object passing over the sensor, or laser or video. Two-sensor (or three-sensor) systems can provide directional logic for vehicles entering or exiting a facility. Two-sensor means, for example, that two sensors are laid in the ground next to each other.

Blue Badge Scheme Technology

The badges rely on a combination of technologies, including; complex printing patterns, a holographic feature, use of security inks available from a restricted list of providers, a central database of all badge holders, raised features and braille, 2D barcodes and a digital photograph. These technologies allow civil enforcement officers to carry out checks using desktop PCs, handheld devices or SMART phones.

Bollard

A short post, generally three to five feet tall that is used to create a visual or protective perimeter.

Bulk Permits

A stack of permits purchased all at once. For example, a department or office may purchase bulk permits for a special event to pass out to its guests.

Cardholder Information Security Program (CISP)

A program from VISA related to handling sensitive credit card data. For the most part, this has been replaced by PCI-DSS.

Card-In, Card-Out

An operating model that allows a customer to use a payment card as an access credential to enter and exit a parking facility. The credit card acts both as credential and payment mechanism. The advantage of credit card use for entry and exit is that the customer is not required to have a ticket. There are also significant revenue security advantages.

Car Park Management Systems (CPMS)

Represents multiple parking technologies beyond access and revenue control, which typically apply to off-street parking facilities. Other systems represented by CPMS include meter revenue systems, parking guidance systems, systems that track occupancy, and other systems that do not necessarily include access and revenue control.

Check Digit

A form of redundancy check used for error detection on identification numbers that have been input manually. For example, the ninth digit in a car's Vehicle Identification Number (VIN) is always a check digit. The other digits in the VIN go through a series of calculations to obtain the correct check digit. This allows computers to tell immediately if there is an error in the VIN, which often happens when someone transcribes a VIN or enters it into a computer.

Chip and PIN

A credit card payment method of accepting any EMV smart card technology that relies on an embedded chip in the credit card to be inserted into an EMV- approved payment device and the user to enter a 4-digit PIN to approve a payment transaction.

Chip and Signature

A credit card payment method of accepting any EMV smart card technology, which relies on an embedded chip in the credit card and verification with a signature by the user instead of an encoded 4-digit PIN. This is similar to the verification used by current magnetic stripe based credit cards.

Chip Card

Also known as an integrated circuit card (ICC), refers to any pocket-sized card with embedded integrated circuits (aka computer chip) with specialised memory. Versions include both read-only and read-write.

Cloud/Cloud Computing

A service, application, or infrastructure hosted on a third-party virtual machine or data centre. Cloud computing allows the user to reduce or eliminate hardware and software by purchasing it as an on-demand service accessible via the internet.

Coin Box/Vault

A secured container for storage of coins and/or bills, normally removable for transport to a secure area for counting of contents.

Coin Hopper

A compartment for storage of coins, usually segregated by denomination.

Coin Shutter

A cover for a coin entry slot that stops dust and contaminants from entering the machine.

Concession Agreement

A form of public-private partnership agreement in which the private entity pays the government agency a large upfront lease payment for the long-term (in excess of 50 years) rights to all ongoing revenues generated by a system previously held by the government agency. Generally speaking, the hours of operation and parking rates (bylaws) are defined in the agreement and can change based on a prescribed schedule. Further changes to the operation's bylaws can result in additional payment(s) made by the private entity to the government agency or vice versa depending on the long-term effect on the parking asset. In most cases, upon commencing the concession agreement, the private entity upgrades the parking technology used within the system; all operating and capital expenditures are the responsibility of the concessionaire.

Connected Car

A car that is equipped with internet access, and usually also with a wireless local area network. This allows the car to share internet access to other devices both inside and outside the vehicle. They provide additional benefits to the driver. Examples include: automatic notification of crashes, notification of speeding and safety alerts.

Contactless Payments System

These are credit cards and debit cards, key fobs, smart cards or other devices that use radio-frequency identification for making secure payments. The embedded chip and antenna enable consumers to wave their card or fob over a reader at the point of sale.

Control Equipment Networks and System

Is a system for remote monitoring and control that operates with coded signals. The signals collectively monitor, sense, and control or enable control of an environment for a particular purpose.

Communications Latency

The amount of time between a request by a user and a response from the machine being used, i.e. time from insertion of a credit card to the finalising of the transaction.

Comprehensive Asset Management Plan (CAMP)

Provides a long-term asset management approach to plan for and minimize the cost of buying, operating, maintaining, replacing, and disposing of parking-related capital assets.

Counting System

A system used to track the number of motorists parked using sensors (loops, infrared, cameras, etc.) that vehicles pass through or over. Also referred to as an occupancy system.

Credential

Also referred to as a permit, allows access to a facility or to park in a certain on-street area (i.e. residential parking pass) and references access control systems.

Credit Card Chip

An integrated circuit embedded in a credit card that can store read/writable data and perform encryption programs that improve transaction security.

Credit Card Gateway

The infrastructure that allows a merchant to accept credit cards, connect with a processor or bank, and process credit card payments. Specifically, the gateway is a service that connects the location's credit card device/server to the credit card processor's system.

Credit Card Processing

The ability to take, validate, and authorise credit cards for payment.

Dashboard

Refers to a web-based page on which real-time information is collated from various sources. The metaphor of a dashboard is adopted to emphasize the nature of the data being displayed on the page; it offers real-time analysis as to how a business is operating.

Data Analytics

The examination and analysis of data to reach a conclusion, make a decision, or improve a process.

Data Protection Act

The Data Protection Act 1998 is an Act of Parliament of the United Kingdom of Great Britain and Northern Ireland which defines UK law on the processing of data on identifiable living people. It is the main piece of legislation that governs the protection of personal data in the UK.

Data Warehouse

An electronic repository of data and information that can be collected from many sources. It retrieves information from authoritative sources in batch or real-time, and provides the ability to perform business analysis searches and queries on the data.

Declining Balance Card/Stored Value Card/Campus Card

A card or account that stores a set amount of value available to a motorist. The motorist (cardholder) cannot spend more than the pre-loaded amount, but usually has the ability to add value to the card. May also be called an eWallet. These systems are typically found in Parking Access and Revenue Control.

Demand-Based Pricing

Pricing parking supply based on demand. Generally speaking, the price of parking.

Department for Business, Innovation and Skills (BIS)

A ministerial department of the UK Government, responsible for policy in many areas including, business regulation and support, innovation, science and research, and skills.

Driver and Vehicle Licensing Agency (DVLA)

Maintain registers of drivers and vehicles in Great Britain.

Electronic Coupon

A document provided in electronic form that allows the user to receive a discount for a service or product. Electronic versions normally contain a barcode to be read by a scanner.

EMV (Europay, MasterCard, and Visa)

A global standard for inter-operation of integrated circuit cards (IC cards or chip cards) and IC card-capable point of sale (POS) terminals and automated teller machines (ATMs), for authenticating credit and debit card transactions. EMV chip cards contain embedded microprocessors that provide strong transaction security features not possible with magnetic stripe cards.

Encoding Station

Connected to a ticket validator, these computers are typically used to allow a cashier to update the magnetic stripe of a parking ticket with new information (rate, payment, etc.).

Encryption

The placement of data into a coded format that can only be read with an encryption "key" or formula that translates the data into a readable format.

Entry Lane Station

An in-lane cashier station or booth in the entry lane to a facility that may be used to collect payment for parking; dispense token, ticket, or other item indicating time of entry or validity of vehicle; or detect permits or other permission to enter.

Ethernet

A type of networking technology. An Ethernet cable is a type of connection that is very common for communication between various pieces of hardware. An Ethernet cable is often used in communication between a computer and other devices such as router, switch, handheld ticket writer's downloading cradle, etc.

Event

This has two meanings in the parking world:

- A special event with resources allocated to it, such as a parade, sports game, city event, or other activity or meeting that is in duration and requires its own dedicated inventory, unique pricing, or both.
- An occurrence that may trigger an alarm via a the Parking Access and Revenue Control System (PARCS) in a facility. In this instance, everything that happens in a facility is an event (some systems refer to facility events as incidents to avoid confusion).

Exception Transaction

A non-cash transaction in a parking facility, such as use of a voucher or phone transaction to pay for parking.

Exit Verifier

Also called an exit station, hardware in a lane into which the motorist inserts a dispensed ticket showing that they paid. The hardware verifies payment and raises the barrier.

Extend-By-Phone

Used in conjunction with mobile payments to allow motorists to add time to their parking sessions via phone (where permitted). In some cases a text message will be sent alerting the motorist that their time is about to expire. Motorists can add time by either texting, using an app, or telephoning.

Facility Management System (FMS)

The computer system and software that provides real-time reporting, monitoring, and controlling of access control. In essence, this represents the brains of the computer system.

Fee Computing Station or Fee Station

Equipment used to process payment, either as pay-on-foot, on-exit or at a central pay station.

Firmware

A software program or set of instructions programmed on a hardware device. Firmware is typically stored in the flash ROM of a hardware device where it can be erased and re-written.

Geo-Fence/GPS Fence

A virtual perimeter around a specific point or area on a geographical map/area. This could be a small or large radius around a desired location set, and personnel are notified when a device enters or exits the area.

General Packet Radio Service (GPRS)

Technology that enables data transfer through mobile networks.
This technology is applicable for text, mobile internet, and other data communications but not voice service. This term has relevance in parking as there is very often a need for data transfer among different areas of a parking operation. For example, individual pay stations must communicate information back to servers and enforcement devices will communicate with permit databases to verify parking eligibility.

Global Positioning System (GPS)

A space-based satellite navigation system used for location tracking. This system has many applications in parking. For example, GPS is used to track parking enforcement activity, including officers' movement and ticket issues.

Global System for Mobile Communications (GSMC)

A standard for digital mobile network communications for the transfer of both data and voice. This term has relevance in parking as there is very often a need for data transfer among different areas of a parking operation. For example, individual pay stations must communicate information back to servers and enforcement devices will communicate with permit databases to verify parking eligibility.

Handheld Computer/Unit

A computer that is small enough to be held in one's hand; used to record evidence and issue parking tickets.

In-car Tag

A piece of equipment used as a hangtag inside a vehicle. Money is linked to the pay machine and the customer uses those funds when he activates the pay machine to park.

Incremental Rates

A method for adjusting rates based on current demand. This allows the parking management entity to maximize revenue during peak demand hours while encouraging additional parkers during off-peak or lower demand hours. One method for using incremental rates might be based on a study of the peak and off-peak hours, with rates based on the time of day and day of the week. Another method could be deployed dynamically by having rates adjusted automatically based on real-time data that tracks available spaces.

Innovate UK

A national body set up by government to stimulate business innovation through a variety of funding tools.

Integrated Circuit Card (ICC)

A chip card or any pocket-sized card with embedded integrated circuits with specialised memory. Versions include both read-only and read-write. 'Chip and PIN' credit/debit cards are a type of ICC that use the EMV standard.

Intelligent Mobility

An approach to journeys using emerging technologies (including autonomous vehicles, seamless journey systems and multi-modal modelling software), to enable the smarter, greener and more efficient movement of people and goods. Intelligent Mobility creates solutions for the challenges that have traditionally beset the transport sector, whether it is congestion, pollution or the lack of "joined up" thinking between different means of transport.

Interface

The point where two different systems or subjects interact. For example the software on a screen used by a person to manage a system is known as a graphical user interface (GUI). An interface between two systems (e.g. parking management and payment) is defined in an interface control document that defines how data is formatted and the rules for accepting data, this is often called an Application Programming Interface (API).

Interoperability

The ability of a system to work with other systems without the need for special adaptation. Interoperability often refers to how 'open' a system or product is (i.e. the willingness of its promoters to allow other systems to interact).

Keypad

An integral set of buttons arranged in a block or pad. Keypads are used as access methods or input devices on parking equipment. Keypads can be mechanical, membrane (either flat or domed), or touchscreen. Most keypads are either alphanumeric (containing the entire alphabet and the numbers zero to nine) or numeric (i.e. with numbers only, styled after a telephone).

Lane Controller

A device or system that manages activity in a lane, activating and deactivating equipment based on triggers such as vehicle presence. The lane controller often sends and receives data from an online central database, enabling overall management of the facility.

License Agreement

A formal agreement or contract between parties that enable one party (the licensee) to legally use the property of another party (the licensor). A license is not a transfer of property (as in a sale). Licenses may be allowed the use of software, intellectual property, physical property etc. They usually define the conditions under which the property can and cannot be used and may be subject to a time limit.

Low Emission Vehicle (ultra).

Vehicles with electric engines, plug-in hybrid engines or cars with CO2 emissions below 75 g/km at tailpipe. Also known in the UK as an "Ultra Low" car. A list of eligible vehicles is published on the gov.uk website.

Magnetic Stripe

A strip of magnetic media usually found on a credential such as a credit card, hotel key, etc that can store a small amount of data. The term is sometimes shortened to mag-stripe. Magstripes come in two main varieties: high-coercivity (HiCo) low-coercivity (LoCo). High-coercivity magstripes require higher amount of energy to encode, are harder to erase, and therefore used in applications such as credit cards. Low-coercivity magstripes require a lower amount of magnetic energy to record, but are much easier to erase and have a shorter lifespan. These are used in applications such as parking tickets. High coercivity stripes are resistant to damage from most magnets likely to be owned by consumers. Low coercivity stripes are easily damaged by even a brief contact with a magnetic purse strap or fastener.

Magnetic Stripe Reader (MSR)

A hardware device that reads the information stored on magnetic stripes and converts it to a signal that can be used by a computer or controller. The reader must make contact with the stripe in order that the data can be read and is therefore subject to wear.

Map-based Technology

Devices and software that provide information to a user, or interactive services, through a map interface. Examples include sat nav devices, Google Street Map etc. Map based apps are also often used in large venues such as shopping centres, campuses etc.

Mesh Wi-Fi

A network of nodes (e.g. laptops, smartphones etc.) in which each node is capable of relaying network signals to the others. This effectively extends the transmission distance (coverage) of a WiFi network beyond that of the base station or access point.

Metro-Mesh or Metro-Scale networks describe the use of Mesh technology (usually specialist repeaters) to create a wide coverage over a built up area. Unlike a normal WiFi network, the capacity can be increased by adding more nodes.

Mobile Payment

A payment made using mobile technology (e.g. a phone, smartphone or tablet). Initially in the UK the term was used to describe systems that allowed customers to pay for parking with a mobile phone as an alternative to coins. In fact this method is usually a way of using stored credit or debit card information to pay for parking.

A type of parking operation that enables a customer to pay using a mobile phone or smartphone app. The pay-by-mobile phone provider charges the customer for parking fees and reimburses the parking operator. Enforcement officers audit by checking online databases for valid plates.

The term mobile payment is now used to describe a wide range of technologies, including PayM and ApplePay that are accessed by the customer through their smartphone.

Monitoring System

A system that allows the user to view system-generated activity, alarms, occupancy and (optionally) CCTV and licence plate information within a facility.

Multi-modal Transport Modelling

A way of simulating a journey undertaken using more than one mode of transport. Most journeys use more than one mode of transport (e.g. train and bus, car and walking). When studying transport therefore, modelling the pattern of journeys need to include the different modes of transport that might be used.

Multi-space Meter

Freestanding hardware associated with multiple parking spaces, used in on-street and surface operations to manage payment for multiple parking spaces. See 'Pay-and-Display'

Near Field Communication (NFC)

A set of standards for smartphones and similar devices to establish radio communication between them by touching them together or bringing them into close proximity, the most well-known examples of this technology are the London Oyster card and contactless payment cards. NFC is a small chip (often embedded in a mobile phone or a plastic card) with short range wireless connectivity (defined as 4cm in the EMV payment standard) that enables quick, secure financial transactions when the NFC enabled device is placed on a reader device.

In payments the technology has the potential to replace coins, tickets and phone calls as the parking payment solution of the future in the UK. NFC payment chips are now also being embedded in "wearable" devices.

Nest

A facility contained within another facility (called a "parent"). Nesting is often used to control access to a specific area within a larger parking facility via the use of gates or barriers.

Note Stacker (Note Vault)

A device used to stack banknotes for collection after they have been accepted for payment by a note validator. The note stacker usually has a unique lock to secure the money when the stacker is removed for collections.

Note Validator

A device used in different parking technologies to accept only valid currencies and read the denomination of banknotes accepted for payment. Note validators and stackers are usually combined in one device.

Optical Character Recognition (OCR)

Software used to "read" data by scanning text or images and convert the information into editable text. One major implementation of OCR in parking is the ANPR system which also uses algorithms to identify likely character combinations on a licence plate.

Park Assist System (PAS or IPAS)

In car systems that assist drivers in parking their vehicle. On vehicles equipped with the system, the car can steer itself into a parking space with little or no input from the user (often depending on whether the car has manual or automatic transmission). Cars can parallel or reverse park into spaces.

Park and Ride

Car parks (usually provided at the periphery of urban areas) with public transport connections. Park and rides enable motorists heading to urban centres to leave their vehicles and transfer to a bus or train for the remainder of the journey.

Parking Access and Revenue Control (PARC)/Access and Revenue Control (ARC)

Systems that are available in varying levels of functionality and complexity. Parking access and revenue control systems (often referred to in Europe as Parking Management Systems) allow parking owners and operators to control access and collect parking revenues from users. Available in varying types of equipment platforms, PARC systems, when combined with policy and procedure, can speed entry and exit from a facility and secure revenues through audit records.

Parking Analytics

Use of technology to collect and analyse parking occupancy and revenue data to plan for rates, hours, enforcement, new technology, and the possibility of dynamic pricing. Data is displayed using a combination of graphics and key indicators for easy viewing and analysis by parking management for strategic decision making. Also often referred to as Business Insight tools.

Parking Guidance System

A system that provides guidance to available parking spaces. In a parking facility these systems can include dynamic signage and individual floor and space availability indicators. Newer generation parking guidance systems detect individual space occupancy with space sensors and can also share information with GPS-enabled vehicles and smartphone apps, which extend them beyond a garage or car park. On street systems are emerging that use a variety of technologies (including scanning cars, individual sensors and/or algorithms) to identify available spaces and smartphone apps to indicate to motorists where spaces are available.

Pay-and-Display

A type of parking operation that requires the customer to pay at a pay station in advance and place a ticket on their vehicle. The customer selects the amount of time and makes a payment. Enforcement officers audit by looking in vehicles for tickets.

Pay-by-Plate

A variation of pay and display in which the customer is required to pay at a pay station in advance. The customer enters their number plate at the station and makes payment. Enforcement officer's audit by checking the pay station or going online to view a list of number plates marked as paid.

Pay-by-Space

A variation of pay and display that requires the customer to pay at a pay station in advance. The customer selects his parking space location (usually numbered) at the station and makes payment. Enforcement officers audit by checking the pay station for a list of paid-for spaces.

Pay-on-Entry

Any type of system configuration in which the customer pays for parking as he enters the facility. It is often used for event parking. A pay-on-entry system can also be used to have customers pay a deposit and receive some portion of that money back on exit if there is more than one rate in effect at a given time.

Pay-on-Exit

Any type of system configuration in which the customer pays in-lane while leaving the facility. Payment may be made to a cashier or use credit card payment in the exit lane (exit verifier).

Pay-on-Foot

A type of parking operation that requires the customer to pay for parking at a pay station before exiting the facility. Customers insert their tickets into a machine and make payment, and the machine returns their ticket. Customers return to their vehicles and drive to the exit lane, where they insert their tickets into the exit verifier.

Payment Card Industry Security Standards Council (PCI)

An association of the five major credit card brands (Visa, MasterCard, American Express, Discover, and JCB) that establishes application, data, and security standards for merchants and processors. Standards are regularly updated, therefore equipment and processes validated under these standards have to be certificated and may become obsolete. Systems that fall within the PCI scope have to be regularly audited.

There are a number of standards that PCI produce that directly impact on payment systems used by the parking industry. These include:

- **Payment Card Industry Data Security Standard (PCI-DSS)** A standard for handling the transmission, storage, and processing of sensitive credit and debit card data. PCI-DSS consists of 12 requirements for establishing security (although the detail of the standard is far more complex).
- **Payment Card Industry Payment Application Data Security Standard (PA-DSS)** A standard for software that handles the transmission, storage, and processing of sensitive credit and debit card data. PA-DSS consists of 14 requirements for establishing security (although the detail of the standard is far more complex).
- **Payment Card Industry PIN Entry Device Security Standard (PCI-PED)** A standard with requirements are primarily concerned with device characteristics impacting the security of the PIN Entry Device used by the cardholder during a financial transaction. Requirements cover a number of aspects of the chip and PIN device including shielding and anti-tamper characteristics.

  For more information on card payments and the parking industry see the European Parking Association European Parking Industry Payments Landscape White Paper at http://www.europeanparking.eu/

- **Payment Card Industry Point-to-point Encryption (PCI P2PE)** A standard for a point-to-point encryption (P2PE) solution as provided by a third party solution provider. It is a combination of secure devices, applications and processes that encrypt data from the point of interaction (for example, at the point of swipe) until the data reaches the solution provider's secure decryption environment.

Permit

An agreement between a parking operator and a customer that allows a driver to park in a designated area; also referred to as permission or a credential. Permits can be validated by a decal, hangtag, RFID tag, virtual (database record), etc. Some systems rely on number plate recognition to read pre-registered license plates that then serve as the parking permit or access credential.

Point of Sale (POS)

A retail term that describes the equipment used to process and record transactions and collect payment. This usually refers to a manual cashier terminal but can refer to automatic payment devices.

Pre-paid parking vouchers/pre-paid magnetically encoded parking cards Tokens that can be purchased and used to pay for time in a car park or on street space.

Programmable Logic Controller (PLC)

PLCs are generic devices (in practice usually small computers) that can be programmed to manage machinery (e.g. traffic lights, doors, etc.) using input from other devices (such as sensors, parking management systems etc.). They are designed to be used in "harsh" conditions (i.e. not in a controlled environment such as an office or server room). PLCs were often used for systems such as level counters where vehicles moving over multiple loops controlled signs that displayed the number of free spaces on a parking level.

Proximity Card

A smartcard that can be read without being inserted into a reader device (see NFC and RFID).

Quick Response Code (QR code)

A type of two-dimensional barcode that has become popular due to its fast readability and ability to contain large amounts of data (compared to standard barcodes). The code consists of black modules (square dots) arranged in a square pattern on a white background. Web links can be embedded in a QR code, which can be printed on a document, poster or other media or displayed on the screen of a smartphone.

Radio-frequency Identification (RFID)

A technology used to communicate information (usually an identification) without physical contact being made between transmitter and receiver (unlike for example magnetic technology, which requires physical contact between magnetic media and reader. There are a number of implementations of this technology, the most well known in parking are MiFare and HID. RFID can be performed over a short range (e.g. in contactless payment) or a long range (as in the Toll TAG). RFID uses a small integrated circuit attached to an aerial. This assembly can be embedded into a card, or other device (such as a smartphone) or even in so-called "wearables". The reader uses radio frequency to "power" the chip to be able to read the information stored.

Real-time Incident Reporting

A reporting system that collates and records events that will affect journeys on roads. Used in conjunction with a navigation system to provide more realistic journey times. There are a number of ways of gathering information, including using roadside cameras to record vehicle speed or the journey times of vehicles between cameras (using pattern recognition or ANPR), recording the position of connected devices (e.g. smartphones or sat navs) or collecting reports from enthusiastic drivers.

Remote Payment System

A system that enables the user to pay for parking without using a specific device (such as a pay and display machine). An example of a remote payment system would be a smartphone app that a customer can use to pay for parking, using a code number to identify the parking place and the vehicle licence plate. Systems can also be used to pay upfront for parking and book spaces.

Renewable Energy

Energy that comes from resources which are naturally replenished on a human timescale such as sunlight, wind, rain, tides, waves, and geothermal heat. For example solar panels that are used to power pay and display machines.

Revenue Control

The management of charges for an asset or service (e.g. a car park) using a revenue control system.

Revenue Control System (RCS)

A system for managing and auditing the payment of charges for parking. The 'system' may be entirely manual (a "person with a bucket") or a sophisticated pay on foot system.

Seamless Journey System

A system that can access information on different modes of transport and make recommendations on how to combine them into a single journey.

Season Ticket

An alternative to paying daily in a car park. This is often monthly, quarterly and yearly.

Secure Access Module (SAM)

Based on a smartcard integrated circuit and used to enhance security performance in devices that commonly needs to perform secure transactions, such as credit card readers. The SAM can be used for secure authentication against smartcards or contactless EMV cards.

Self-filling Coin Mechanism

A piece of hardware within a payment machine that distributes coins for the purpose of providing change and is replenished by sorting coins deposited by customers.

Sensor

The electronics in the hardware associated with a lane. It choreographs the activity in the lane, activating and deactivating equipment based on triggers such as vehicle presence. The lane controller often sends and receives data from an online central database to allow access to the facility.

Short-term Parking

Parking spaces that are restricted to limited duration/time (usually less than a day and often less than four hours). Restricted or regulated parking and spaces with parking meters are common examples of short-term parking. Short-term parking is typically used near businesses to provide parking for customers while encouraging turnover.

Single-space Meter

Freestanding hardware associated with a single parking space, used in on-street and surface operations to manage payment for the parking space. See 'Pay and Display'

Single-space Smart Meter (SSSM) [This is an American concept that is not used much in the UK]

Connected to the internet via a built-in modem that allows the meter to accept credit and debit cards, connect to vehicle sensors, or display time purchased from an integrated mobile payments provider. SSSMs are powered by an integrated solar panel that recharges a battery pack stored within the meter's housing.

Smartcard

A chip card, integrated circuit card (ICC), or any pocket-sized card with embedded integrated circuits with specialised memory. Versions include both read-only and read-write.

Smart City

There is no universally agreed definition, it means different things to different people. The conceptualisation of Smart City, therefore, varies from city to city and country to country. A widely accepted definition is: A developed urban area that creates sustainable economic development.

The European Commission defines it as: The smart city concept goes beyond the use of ICT for better resource use and less emissions. It means smarter urban transport networks, upgraded water supply and waste disposal facilities, and more efficient ways to light and heat buildings. And it also encompasses a more interactive and responsive city administration, safer public spaces and meeting the needs of an ageing population.[1]

The smartcitiesprojects in India defines it as: A city can be defined as 'smart' when investments in human and social capital and traditional (transport) and modern (ICT) communication, infrastructure, fuel, sustainable economic development and a high quality of life, with a wise management of natural resources, through participatory action and engagement.[2]

Solar Panel

An electrically connected set of photovoltaic modules within a frame that converts the sun's energy to a source of power. Typically, in parking, solar panels are used to supply power to hardware devices that are either hard to supply AC power to or when it is not reasonable to run power to the device. Many "green" parking facilities are installing solar panel arrays onsite to return power to the grid.

Solar Regulator

Controls the flow of power received from a solar panel to a battery pack. A faulty solar regulator can cause the battery to deplete its charge due to the use of hardware peripherals connected to the battery pack.

Space Sensor

A piece of hardware installed either at or above grade or on or inside a post to monitor the presence of a vehicle in a specific area or space. Sensors then transmit this information in real-time or near-real-time to a web-based software application where the data is stored for analytical or enforcement purposes.

1. https://ec.europa.eu/digital-single-market/en/smart-cities
2. http://www.smartcitiesprojects.com/whats-the-real-mean-of-smart-city/

Space Utilization

The process of recording the full and empty spaces in a lot or facility for analysis.

Sustainable Technology

Technology systems that use renewable energy to power them. For example electric cars and LED based light technology.

Ticket Validator

Electronically encodes validations either onto the original transient ticket or onto a separate magnetic stripe validation ticket. Encoding stations are a basic offering in access control.

Time-Variable Pricing

Any user charge that varies by time period; helps manage demand and turnover.

Transportation Demand Management (TDM)

The implementation of policies or best practices that reduce the use of single-occupancy vehicles on public roadways in favour of public transportation. TDM strategies often lead to better ingress or egress of vehicular traffic in an urban or congested environment.

Transport Systems Catapult

The UK's innovation centre for Intelligent Mobility in transport. They are overseen by the UK's innovation agency, Innovate UK. They were created to drive and promote Intelligent Mobility—using new and emerging technologies to transport people and goods more smartly and efficiently.

Turnover

How often a parking space in a specific area/car park goes from being unoccupied to occupied and vice versa within a given period of time; often measured over the course of a day or hours of operation.

Validation

A discount provided to parking customers. The discount is given if specific criteria is met and the amount is usually charged to the driver or the department or business that gave the parker the validation. Validation also refers to the process of inserting a ticket into a ticket validator and recording a discount on it. May also be called a Reduction. Validation is often achieved with the use of vouchers or coupons but is increasingly achieved using online devices.

Variable Message Sign (VMS)

An electronic traffic sign that can be programmed to display short messages. VMS are often used on roads to give information to motorists. Such signs warn of traffic congestion incidents, roadwork zones, and can also be used to give information on spaces in Car Parks. Basic signs can display text, more sophisticated LED based signs are capable of displaying text and pictograms. The Highways Agency has standards that specify the size of sign required in a given situation and the maximum amount of information that can be usefully given.

Video Detection/Video Analytics

A system in which a closed-caption television (CCTV) camera captures an image that can be read and recognised via specialised software. In the case of vehicle detection, the image is read and the software determines within a degree of certainty that what is on the screen is a car. This system is a very effective method of covering large areas such as intersections or entire streets.

Wayfinding

The ability to navigate from starting point to destination. In a parking context, wayfinding refers to signage and other resources that enable customers to navigate the car park both in a vehicle and on foot.

Wheel Clamp

A device that is designed to prevent vehicles from being moved. In its most common form, it consists of a clamp that surrounds a vehicle wheel and is designed to prevent removal of both itself and the wheel.

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Advancing the parking profession

BPA BRITISH PARKING ASSOCIATION

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