



# What's What in Parking Technology

**A Glossary of Parking Technology Terms**

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Over the last 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 public when discussing parking technology. Words printed in blue are defined elsewhere in this glossary.

## **Access Control**

Managing the access in and out of a parking **facility**; parker must present a valid parking credential.

## **Access and Revenue Control (ARC), also known as Parking Access and Revenue Control (PARC)**

Available in varying levels of functionality and complexity, access and revenue control systems allow parking owners and operators to control access and collect parking revenues from users. Available in varying types of equipment platforms, ARC systems, when combined with policy and procedure, can speed entry and exit from a **facility** and secure revenues through audit records.

## **Access Control System (ACS)**

A system of hardware and software that controls access to **facilities** with **gates**.

## **Alarms**

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).

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## 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 setting rejects ACS users that are out of sequence and should be set to send an **alarm** at the ACS controller and 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 patron-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 resynchronization of the user’s account.

## Appeal

The disputing of a citation. Also called adjudication or hearing. Can be regulated by statute in a municipal environment. Often associated with an appeals panel in a university setting.

## Audit

The process of reconciling financial transactions with operating transactions for a day or other defined period. This is particularly sensitive in a **revenue control** operation, where a certain amount of theft is possible. Proper audit operations include ticket, spot, and shopper audits to ensure revenue security.

## Authoritative Data Source

The system that has ownership of data or process. Many systems can access the data, but only an authoritative system maintains the original record and controls changes to the data. Example: The department of motor vehicles is the authoritative source of driver license numbers. A parking operation might use this number but is not allowed to change/alter it because the parking office is not the authoritative source of that piece of data.

## 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-in-lane 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 **RFID**, **LPR**, and **Proximity** cards.

## 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.

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## Batch

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

## 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.

## Card-In-Card-Out

An operating model that allows a customer to use a credit 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.

## 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**.

## Car Park Management Systems (CPMS)

Represents multiple parking technologies beyond revenue and **access 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**.

## Central Cashier

Can be a person (cashier) or pay station. The customer takes their ticket after it is processed and inserts it into an **exit verifier**. A central cashier staffed by a person may also take citation payments and sell **permits**. The key is that it is centrally located and not typically located in a lane.

## 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 parkers 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**, it 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 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.

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## Credit Card Processing

The ability to take, validate, and authorize 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 here to emphasize the nature of the data being displayed on the page; it is a real-time analysis as to how a business is operating.

## 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 parker. The parker (cardholder) cannot spend more than that 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 **PARCS**.

## Demand-Based Pricing

Pricing of parking supply based on demand. Generally speaking, the price of parking should be set so there is always an available space on any given block face.

## 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

A computer with encoding software that is connected to a **ticket validator**. These are typically used to allow a cashier to update the **magnetic stripe** of a parking ticket with new information (rate, payment, etc).

## 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.

## Event

This has two meanings in the parking world:

1. A special event with resources allocated to it, such as a parade, sports game, city event, or other activity or meeting that is finite in duration and requires its own dedicated inventory, unique pricing, or both.
2. An occurrence that may trigger an **alarm** via a **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 of terms).

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## Exception Transaction

A non-cash transaction in a garage, such as use of a coupon to pay for parking.

## Exit Verifier

Also called an exit station, hardware in a lane where the customer inserts a dispensed ticket showing that they paid. The hardware verifies payment and raises the **gate**.

## Extend-by-phone

Used in conjunction with **pay-by-phone** and meters to allow parkers to add time to their parking sessions via phone. Typically, the meter will send a text message alerting the parker that his time is about to expire. Parkers can add time by texting back.

## Facility

Also called a garage, deck, or ramp. In some software, a surface lot can also be defined as a facility.

## Facility Management System (FMS)

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

## Fee Computing Station or Fee Station

The **point of sale** equipment used to process payment, either in-lane or at a **central cashier**.

## Gate

The hardware used to control access to a **facility** or surface lot.

## Handheld Ticketwriter

A computer that is small enough to be held in one's hand; used to write electronic parking citations.

## In-Car Meter

A piece of equipment used as a hangtag inside the vehicle. Money is linked to the meter and the customer uses those funds when they activate the meter to park.

## Interface

The part of a system that allows another system to connect to it. Specifically, the interface defines how data is formatted and what the rules are for accepting data. Programs that pass information from one system to another are often referred to as interfaces.

## Interoperability

The term for systems that share data and processes.

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## Keypad

An integral set of buttons arranged in a block or pad. Keypads are used as access methods or input devices on parking equipment. Most keypads are alphanumeric and contain the entire alphabet and the numbers zero to nine or are styled after telephone keypads so that pressing a number key repeatedly changes the display to a corresponding letter. Keypads themselves can be mechanical, membrane (either flat or domed), or touchscreen.

## Lane Controller

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**.

## Loops

Sensors that are placed in the ground of a lane or level of a **facility** to detect a vehicle passing overhead. They track occupancy and enable ticket dispensers or **permit** readers by identifying the presence of a metal object passing over the loop. Two-loop (or three-loop) systems can provide directional logic for vehicles entering or exiting a facility. Two-loop means that two loops are laid in the ground next to each other.

## License Plate Inventory (LPI)

A process that uses **license plate recognition** or the manual collection of license plate information via handheld devices to count and keep track of vehicle license plates. It can be used in both controlled access and open **facility** environments to keep track of vehicles accessing a facility.

## License Plate Recognition (LPR)

This is a vehicle identification technology that uses cameras to take pictures of license plates, read the images via character recognition software, and convert the images into text that a computer can use. LPR is common in **access control**, tolling, and stolen vehicle detection applications. Sometimes called ANPR (automatic number plate recognition).

## Lot Utilization

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

## Magnetic Stripe

A strip of magnetic media usually found on a **credential** such as a credit card, hotel key, etc. The term is sometimes shortened to mag-stripe. The magnetic stripe can store a small amount of data.

## Magnetic Stripe Reader (MSR)

A hardware device that reads **magnetic stripes** and converts information stored there to data that can be used by a computer or controller.

## Monitoring System

A system that allows the user to view system-generated activity, **alarms**, and occupancy within a **facility** via the **PARCS**.

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## Multispace Meter

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

## 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**.

## 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.

## Non-Transient

Someone who uses a **permit** or **credential** to park on an ongoing basis (e.g., monthly parker). This can be in an **access controlled facility** or in a surface lot with no **gate**.

## Occupancy

The percentage of spaces in a **facility** that are occupied. Rules can be set to limit the number of parked vehicles based on a schedule. Example: If a facility has a capacity of 100 spaces and 90 of them are occupied, the occupancy is 90 percent.

## Off-street Parking

Refers to all parking not on/along the curbs of streets; includes private and public lots, garages, driveways, etc.

## On-street Parking

Refers to all parking on/along the curb of streets.

## PARCS

Acronym for Parking **Access and Revenue Control** System.

## Parking Guidance System/Wayfinding

A system, typically internal to a parking **facility**, that provides guidance to open parking spaces. These systems can include dynamic signage and individual floor and space availability indicators. Newer generation parking guidance systems detect individual space **occupancy** with stall sensors and can also share information with GPS-enabled vehicles and smartphone apps, which extend them beyond a garage or surface lot.

## Pay-and-display

A type of parking operation that requires the customer to pay at a pay station in advance and place their receipt on their vehicle. The customer selects the amount of time and makes a payment. A receipt/**permit** prints and is displayed in the vehicle, usually on the dashboard. Enforcement officers audit by looking in vehicles for receipts.

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## Pay-by-cell Phone

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

## Pay-by-plate

A type of parking operation that requires the customer to pay at a pay station in advance. The customer enters his license plate number at the station and makes payment. Enforcement officers audit by checking the pay station or going online to view a list of license plates marked as paid.

## Pay-by-space

A type of parking operation 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 where the customer pays for parking as he enters the **facility**. It is often used for **event parking**. 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-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 station.

## Pay-on-exit

Any type of system configuration where 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**).

## Payment Card Industry (PCI)

An association of (primarily) credit card brands such as VISA and MasterCard, who establish application, data, and security standards for merchants and processors.

## Payment Card Industry Data Security Standards (PCI-DSS)

A set of guidelines for handling the transmission, storage, and processing of sensitive credit and debit card data.

## Payment Card Industry Payment Application Data Security Standards (PCI-PA-DSS)

A validation program for manufacturers of payment processing equipment or software that validates their systems comply with data security standards for transmitting, storing, and processing credit and debit card data.

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## Permit

Anything that allows a driver to park in a designated area; also referred to as permission or **credential**. Can be a decal, hangtag, **RFID**, virtual (database record), etc.

## Permitless Parking

A parking system that relies on **license plate recognition** to read pre-registered license plates that serve as parking **permits** or access **credentials**.

## Portal

A view (doorway) into other systems, usually for the purpose of aggregating related-but-separate data into a single place for convenience.

## Point of Sale (POS)

The equipment used to process and record transactions and collect payment. Typically associated with credit card payments (slide, tap, etc.).

## Proximity card

A smart card that can be read without being inserted into a reader device.

## Quick Response Code (QR code)

A type of two-dimensional **barcode**, this has become popular due to its fast readability and large storage capacity as 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 or displayed on the screen of a smartphone.

## Real-time

An **interface** that updates instantly.

## Revenue Control

Involves **transient** and non-transient parker management and includes payment at the time of parking. Typically it refers to the servers, terminals, and kiosks used for payment and **gate** control in a garage.

## Radio-frequency Identification (RFID)

An automatic identification method that relies on storing and remotely retrieving data using devices called RFID tags or transponders. RFID is used mainly in access and revenue control facilities and is another form of **permit**.

## Revenue Control System (RCS)

A system for managing and auditing the payments of **transient** and non-transient parkers in parking lot or **facility**. Also known as **PARCS**.

## Scofflaw

A repeat parking offender. Many organizations maintain lists of known scofflaws.

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## 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 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.

## Smartcard

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

## 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 **PARCS**.

## Time-Variable Pricing

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

## Transient

A parker who pays for parking on a short-term basis, typically daily or less. Transient customers typically pay for the amount of time used versus buying a set period of time to park (i.e., a month, a semester, etc.)

## Validation

A discount provided to parking customers. The discount amount is usually charged to 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 payment on it. May also be called vouchers or coupons.

## Video Detection or Video Analytics

A system in which a closed-circuit television (CCTV) camera captures an image that can be read and recognized via specialized 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.

## Waiting List

A list of customers waiting for space to open up in a given **facility** or for a specific kind of **permit**.



*Advancing the parking profession*

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