Buyer's Guide

From a blind lot to a guided one: how to choose, size and deploy IoT parking guidance for your facility.

This guide walks you through every decision between "we need better parking" and "the signs are live." It is written for facility managers, property developers, parking operators, consultants and municipal planners who are evaluating a smart parking system for the first time or replacing an aging one.

Read it front to back for the full picture, or jump to the section that matters right now:

1. What smart parking actually is (and what it is not)

Smart parking is the use of IoT sensors, vehicle counters and guidance signage to detect occupancy in real time and show it to drivers and operators. The core loop is three words: **detect, decide, display.**

Detect. A sensor or counter registers vehicles entering, leaving or occupying a space.

Decide. An edge controller turns those events into a live occupancy figure, applies your rules and determines what to show.

Display. Guidance signage and dashboards present the result so a driver can act on it instantly and your team can see the whole site from anywhere.

What smart parking is not:

- It is not enforcement. It does not ticket, boot or tow. It steers drivers to open spaces rather than penalizing them for being in the wrong one.
- It is not access control. Gates, barriers and license-plate recognition (LPR/ANPR) manage who enters. Smart parking manages what they see once inside.
- It is not a replacement for your existing systems. A well-designed parking guidance system layers on top of whatever barriers, payment machines or building management you already run.

The industry term for the guidance-focused form of smart parking is an **automated parking guidance system (APGS)**. That is where IoTize hardware sits: the layer that detects, counts, processes and displays availability, leaving access control and payment to your existing stack.

2. The five problems a smart parking system solves

Before comparing products, confirm which problems are costing your site the most. Every facility we work with traces its parking pain to one or more of these five leaks.

2.1 Search traffic

Drivers circle the aisles hunting for a space. This congests gates, ramps and internal lanes, raises collision risk and turns a five-minute visit into a twenty-minute frustration. The INRIX Parking Study (2017) found that American drivers spend roughly 17 hours per year searching for parking, at an estimated individual cost of $345 in wasted time, fuel and emissions.

2.2 Turn-aways

A queue visible from the road reads as "the lot is full," so drivers leave for a competitor even when open decks exist above or behind. Revenue and footfall walk away without the facility ever being at capacity.

2.3 Manual counting

Staff walk the decks, radio counts to a colleague at the gate and keep paper or spreadsheet logs. The labor is expensive, the data is stale by the time it reaches a decision-maker and accuracy drops at shift change.

2.4 Uneven filling

The ground deck jams while the upper decks sit half empty. Capacity the facility already owns goes unused because drivers default to the nearest aisle, not the emptiest level.

2.5 No usage history

Occupancy is guessed rather than recorded. Without historical data, there is no evidence for pricing adjustments, staffing decisions or expansion business cases. Capital requests lack the numbers to get approved.

The honest first step is not more concrete, more paint or more staff. It is visibility: knowing, in real time, how many vehicles are where, and showing that number to the driver before they start circling.

3. How a smart parking system works, layer by layer

A smart parking system is a pipeline. Data moves through it in one direction, from the vehicle at the lane to the driver's eye and the operator's dashboard.

Layer 1: Detection. A sensor or counter at the lane or above the bay registers a vehicle event (entry, exit, occupied, free). This is the raw input.

Layer 2: Counting and occupancy. The detection device or its paired controller converts events into a live figure: count-in, count-out, spaces free, percentage full, by zone, by level or by bay.

Layer 3: Edge control. An IoT edge controller collects data from every detection point, applies your rules (thresholds, zone groupings, sign messages, alert triggers), drives the signs and streams to the cloud or your own servers. Because it processes on-site, guidance stays fast and resilient, even through an internet outage.

Layer 4: Display. Guidance signage at each decision point shows the result: a count, an arrow, a color, a "FULL" message or a combination. The driver sees it and acts.

Layer 5: Dashboard and history. The same data feeds a web dashboard (or your SCADA, MES or BMS) for live monitoring, alerts, trend reports and planning. This is where occupancy history becomes a business asset.

Every layer should use open, standard protocols (HTTP, MQTT, Modbus TCP, RS-485 for legacy signs), so the system drops into what you already run instead of forcing a rip-and-replace.

4. Sensor and detection technologies compared

The detection layer is where most of the cost, accuracy and installation complexity sit. Choose the wrong sensor for your environment and the whole system underperforms. Here are the five families you will encounter.

4.1 Entry/exit vehicle counting (lane-level)

How it works: A sensor pair or a single directional counter at the lane detects each vehicle entering and leaving, producing a running total of vehicles inside.

Best for: Gated garages, toll plazas, campus entrances and any site where vehicles must pass through a choke point. Gives you a reliable "spaces free" number without wiring every bay.

Limitations: Cannot tell you which specific space is open, only how many are open in total. Accuracy depends on the counter not missing a vehicle; a small miss rate compounds over thousands of events per day, so periodic resets or reconciliation logic help.

IoTize product: IoT Entry/Exit Vehicle Counter (Custom Series, from $249).

4.2 Ultrasonic bay sensors

How it works: A ceiling-mounted sensor above each bay emits a 40 kHz sound pulse and measures the echo. If the echo returns within a threshold distance, a vehicle is present.

Best for: Indoor, covered garages where the ceiling is a consistent height. Widely deployed, well understood.

Limitations: Dust, cobwebs and temperature swings can drift the reading. Tall vehicles (SUVs, vans) in adjacent bays can cause false positives. Each sensor needs a cable run to a controller, which adds installation cost in older buildings with no cable trays.

4.3 Radar and mmWave bay sensors

How it works: A sensor emits millimeter-wave electromagnetic pulses and analyzes the reflected signal. It can detect presence, height and even motion.

Best for: Outdoor and semi-open structures where temperature and humidity swing widely, and where ultrasonic sensors would struggle. Also handles covered and indoor garages.

Limitations: Higher unit cost than ultrasonic. Can produce false detections from nearby metal structures (guardrails, pipes) if not filtered well.

4.4 Camera-based detection

How it works: A wide-angle camera above the aisle views multiple bays at once. Software processes the image to determine which bays are occupied.

Best for: Sites that also want license-plate recognition (LPR), dwell-time tracking or visual verification of incidents. One camera can cover several bays, reducing wiring runs.

Limitations: Lighting matters: glare, deep shadow and headlight flare reduce accuracy. Privacy regulations in some jurisdictions require notices, data processing agreements and retention policies. Processing is more compute-intensive than simple sensors.

4.5 Magnetometer (in-ground) sensors

How it works: A battery-powered sensor is flush-mounted in the pavement. It detects the distortion in the earth's magnetic field caused by a vehicle's metal mass.

Best for: On-street metered spaces and open-air lots where ceiling-mounted sensors are not possible. Wireless and battery-powered (5 to 10 year life), so no cable trenching.

Limitations: Heavy vehicles in adjacent lanes can ghost. Pavement cutting is required for installation. Battery replacement means a site visit per sensor every several years.

Which technology should you choose?

Factor	Lane counting	Ultrasonic bay	Radar bay	Camera	Magnetometer
Accuracy for "spaces free"	High (total)	High (per bay)	High (per bay)	High (per bay, light-dependent)	Moderate to high
Indoor suitability	Yes	Yes (best)	Yes	Yes	Rarely used
Outdoor suitability	Yes	Poor	Yes (best)	Light-dependent	Yes (best)
Per-bay detail	No (total only)	Yes	Yes	Yes	Yes
Install complexity	Low (per lane)	Medium (cable per bay)	Medium (cable per bay)	Low (fewer units)	Medium (pavement cut)
Relative unit cost	Low	Low to medium	Medium to high	Medium	Medium

IoTize recommendation: Start with **lane-level counting** at every entrance and exit. It gives you the single most useful number, "spaces free," at the lowest cost and complexity. Add per-bay sensing later, at the levels or zones where drivers need exact space-by-space guidance. The IoTize Parking Guidance Gateway is designed as the integration point for both, so nothing you buy at the lane stage is wasted when you add bay sensors.

5. Signage technologies compared

Detection tells the system what is happening. Signage tells the driver what to do. The display is the part the public sees, so it shapes perception of the entire facility.

5.1 Full-color LED matrix signs (indoor)

What they are: Rectangular LED panels, typically mounted on ceiling beams at ramps, junctions and garage entrances. They display counts, directional arrows, text, colors and even logos using individually addressable LEDs.

Best for: Multi-level garages and covered structures with mains power at every sign location. They are the primary workhorse of a parking guidance system.

Strengths: High visibility, full-color graphics, remotely updatable content, can display multi-zone counts on a single panel.

Considerations: Require mains power and a data connection (wired or wireless) to the edge controller. Brightness settings may need adjustment for tunnels versus open ramps.

IoTize product: IoT Indoor LED Signage Display (Custom Series, $999). 1000 by 200 mm, full-color, animated arrows, text and logos.

5.2 Flip-dot electromechanical signs (outdoor, off-grid)

What they are: Signs made of small discs that physically flip between two colors (typically fluorescent yellow and black). A brief electrical pulse flips a disc; once flipped, it holds its position with no power, making the display bistable.

Best for: Curb-side entrances, surface lots and any location with no mains power run. Because flip-dot displays are sunlight-readable (they reflect ambient light rather than emitting it), they are ideal for outdoor daytime use.

Strengths: Extremely low power consumption (draw only at the moment of update), solar and battery operation, IP65 weather rating, sunlight readability, no screen glare.

Considerations: Lower resolution than LED (limited to the disc grid, for example 7 by 20 discs). Cannot display full-color graphics. Update speed is slower than LED (typically under one second, but not instant). Best suited for simple messages: counts, "OPEN"/"FULL", directional arrows.

IoTize product: Smart Parking Flip-Dot Guidance Signage (Custom Series, $1,600). 7 by 20 disc matrix, solar and battery powered, wireless, cloud connected, IP65, customizable sizes.

5.3 Simple green/red LED indicators (per-bay)

What they are: Small LED lights mounted above or beside each parking bay. Green means the bay is free; red means it is occupied.

Best for: Indoor garages where drivers need to see at a glance which exact bay is open in a row, especially in large or poorly lit structures.

Considerations: Require a per-bay sensor feeding each light. Wiring density is high: every bay needs a sensor and an indicator. Most effective when combined with zone-level LED guidance signs at the aisle entrance so the driver reaches the right aisle first.

IoTize roadmap: Bay-level red and green indicator lights are in development at IoTize and are not yet available to order. The Parking Guidance Gateway is already designed as the integration point, so sites that start with lane counting today will be ready for bay-level indicators when they launch.

Signage placement rules of thumb

- **One sign at every decision point.** A decision point is any place a driver must choose between two or more routes: a ramp split, a T-junction, a level entry.
- **One sign at the main entrance.** This is the first impression and the most important: it tells the driver "there are spaces" before they commit to entering.
- **One curb-side sign if visible from the road.** If drivers can see a sign before turning in, you cut turn-aways and search-driving on the public road.
- **Consistency.** Use the same sign style and message format at every point. Mixed formats confuse drivers and slow decision-making.

6. Edge control and connectivity

The edge controller is the brain. It sits between the sensors and the signs, and it determines what drivers see.

What the edge controller does

- Collects data from every connected sensor and counter.
- Calculates live occupancy by zone, level or bay.
- Applies your rules: at what count does a sign switch from "AVAILABLE" to "FULL"? Which zones should fill first? When should an alert fire?
- Drives every connected sign with the correct message.
- Streams data to your dashboard, cloud, SCADA, MES or BMS.
- Logs everything for historical reporting.

Why edge processing matters

A cloud-only architecture sends every sensor event to a remote server, waits for it to be processed and then sends a command back to the sign. That round trip adds latency. Worse, if the internet goes down, guidance stops.

An edge controller processes locally first, so the sign updates in milliseconds and continues working through an internet outage. The cloud still receives the data for dashboards and long-term analysis, but it is not in the critical path between the sensor and the sign.

Connectivity options

Protocol	Use case	Notes
Ethernet (wired)	Backbone between controller and cloud/dashboard	Most reliable, lowest latency, requires a cable run to the controller cabinet
Wi-Fi	Sensor-to-controller or controller-to-cloud in smaller sites	Convenient but susceptible to interference in concrete structures
Cellular (4G/LTE, GSM)	Remote sites, curb-side signs, surface lots	No wired infrastructure needed; ongoing SIM cost
RS-485	Controller-to-sign wiring in legacy or new sign runs	Standard for industrial signage, reliable over long runs
MQTT / HTTP	Cloud telemetry, dashboard integration, API feeds	Open protocols, widely supported, no vendor lock-in
Modbus TCP	Integration with SCADA, BMS, industrial control	Standard in building and facility management

IoTize product: Parking Guidance Gateway (Custom Series, from $449). IoT edge controller with cellular, wireless and wired connectivity, edge processing, sign driving, cloud streaming and integration APIs.

7. Deployment and data ownership models

This is the section most buyers skip and most regret skipping. Where your data lives and who controls it determines your long-term flexibility and your recurring cost.

7.1 Vendor SaaS (hosted cloud)

How it works: The vendor hosts your dashboard, stores your data and manages the platform. You log in through a browser.

Best for: Fast starts, small IT teams, single sites where speed of deployment matters more than customization.

Watch for: Data portability. Can you export your full occupancy history if you leave? Is your data stored in a region compliant with your privacy regulations? What is the recurring subscription cost per device or per space?

7.2 On-premises or private cloud

How it works: The software runs on your own servers, in your own data center or in a private cloud instance you control.

Best for: Security-sensitive environments (hospitals, government, airports), organizations with existing IT infrastructure and operators who want full control of uptime and data retention.

Watch for: You need IT staff to maintain the servers and apply updates. Confirm that the vendor supports on-prem deployment with the same features as SaaS, not a stripped-down version.

7.3 Direct integration (SCADA, MES, BMS, your own platform)

How it works: The edge controller streams raw data directly into your existing systems via open APIs, MQTT, Modbus TCP or HTTP. There is no separate parking dashboard; the data lives in the tools your operations team already uses.

Best for: Large operators with mature IT stacks, mixed-use campuses where parking is one of many monitored systems and organizations that want a single pane of glass.

Watch for: Integration scope and cost. Confirm the vendor provides documented APIs and supports your protocols. Ask for a reference site where direct integration is live.

The IoTize position: IoTize supports all three. SaaS for a fast start, on-prem or private cloud for full control, or direct integration into SCADA, MES or your platform via open protocols. Your occupancy data is never bound to IoTize servers. You can switch deployment models without replacing hardware.

8. Site survey: the 12-point checklist

Before you size a system or request a quote, survey the site. This checklist captures the information any vendor needs to design your system accurately.

1	Site plan or floor plan. A drawing of every level, with lanes, ramps, junctions, entrances and exits marked. Even a hand sketch is better than a verbal description.
2	Entrance and exit count. How many vehicle entry points and exit points does the site have? Include staff and service entrances if they affect the count.
3	Total capacity. The number of marked bays per level and per zone, plus any unmarked overflow areas.
4	Decision points. Walk the site as a driver would. Every place you must choose left or right, up or down, is a decision point and a candidate for a sign.
5	Existing infrastructure. Note any barriers, gates, payment machines, ANPR cameras, boom controllers or BMS systems already in place. The parking guidance system should integrate, not replace.
6	Power availability. At each sign location, is mains power available within a reasonable cable run? If not, that location is a candidate for a solar or battery-powered sign.
7	Network and data connectivity. Is there Ethernet or Wi-Fi at the controller cabinet location? Is cellular coverage adequate? If the controller needs to stream to the cloud, confirm the path.
8	Ceiling height and obstructions. For ceiling-mounted sensors or signs, note the height, sprinkler heads, pipes, cable trays and HVAC ducts that could block mounting or sensor line-of-sight.
9	Lighting conditions. For camera-based detection, note areas with direct sunlight, deep shadow or headlight glare. For flip-dot signs, note whether the sign face will receive ambient light (required for readability).
10	Environmental conditions. Indoor, outdoor, semi-open? Temperature range? Exposure to rain, dust, salt air? This determines IP rating requirements.
11	Traffic volume and peak hours. Approximate daily vehicle count, and which hours or days see peak demand. This helps size the system and set realistic accuracy expectations.
12	Integration requirements. What systems should receive the parking data? Dashboard only? SCADA? BMS? A mobile app? A public API? Define this now, not after installation.

Tip: photograph each decision point and each candidate sign or sensor location. A photo album keyed to the floor plan saves hours of back-and-forth during quoting.

9. Sizing your system: four reference layouts

Use these as starting points. Every site is different, but these patterns cover the most common configurations.

Layout A: Single gated entrance, one display

Site type: Small surface lot, single-level garage, gated compound.

Components:

- 1 IoT Entry/Exit Vehicle Counter at the lane
- 1 Parking Guidance Gateway in the field cabinet
- 1 IoT Indoor LED Signage Display at the entrance

What it gives you: A live "spaces free" count at the door, a dashboard with occupancy history and the foundation for everything else.

Typical starting investment: Counter from $249 + Gateway from $449 + LED Display $999. Final price quoted to your layout.

Layout B: Multi-level garage, LED signs at every decision point

Site type: Shopping mall garage, hospital parking structure, airport short-stay.

Components:

- 1 Vehicle Counter per entrance and exit lane
- 1 Parking Guidance Gateway (one gateway can manage multiple counters and signs)
- 1 LED Signage Display at every decision point (typically one per ramp split plus one at the main entrance)

What it gives you: Level-by-level or zone-by-zone guidance. Drivers see which deck has space before they commit to a ramp.

Scaling note: A 3–level garage with 2 ramp splits and 1 entrance typically needs 3 to 5 displays. Add one at the street if the entrance is visible from the road.

Layout C: Surface lot with no mains power at the curb

Site type: Open-air lot, park-and-ride, event venue, street-side lot.

Components:

- 1 Vehicle Counter at the lane (or one per lane if multiple entrances)
- 1 Parking Guidance Gateway
- 1 Smart Parking Flip-Dot Guidance Signage at the curb (solar and battery)

What it gives you: A curb-side "spaces free" count that runs on solar, visible to drivers on the road before they turn in. No trenching, no power run.

Why flip-dot: The sign holds its image with no power (bistable), draws energy only at the moment of update and is sunlight-readable because it reflects light rather than emitting it.

Layout D: Campus or city, multiple sites on one platform

Site type: University campus, corporate park, municipal district.

Components:

- Vehicle Counters at every entrance and exit across all sites
- One Parking Guidance Gateway per site (or per cluster of nearby entrances)
- A mix of LED and flip-dot signage at each site
- A centralized dashboard aggregating all sites

What it gives you: A single view of occupancy across every lot, with the ability to redirect traffic from a full lot to a nearby one that still has space. Historical data across the portfolio supports system-wide planning.

Scaling note: Because the IoTize platform uses open protocols, adding a new site means adding hardware and pointing it at the same dashboard. No new software license, no platform migration.

10. Total cost of ownership and ROI

What you pay for

The total cost of a smart parking system is not just the hardware. Budget for these five layers.

Hardware. Sensors, counters, controllers, signs. This is the visible cost and the one most buyers focus on.

Installation. Mounting, cabling, commissioning. Costs vary with ceiling height, cable-run length and whether the facility can stay open during installation. Lane-level counting is the lightest install; per-bay wiring is the heaviest.

Connectivity. SIM cards for cellular gateways, network switches for wired sites, cloud hosting if using vendor SaaS. Ongoing monthly or annual cost.

Software and licensing. Some vendors charge per device, per space or per site, monthly or annually. Ask for the five-year total, not just year one.

Maintenance. Sensor cleaning, firmware updates, sign replacements. Battery-powered sensors need a replacement cycle (typically 5 to 10 years). LED signs have a long panel life but may need a power supply swap after several years.

Where the return comes from

Recovered revenue. Drivers stop leaving a lot that only looked full. Even a small reduction in turn-aways at a commercial lot translates directly to footfall and tenant satisfaction.

Lower labor cost. Manual counting and hand-directed traffic end. Staff hours are redirected to higher-value work.

Higher throughput. Guided drivers park faster, so queues shrink and more vehicles process through the same gate in a peak hour.

Planning value. Occupancy history shows when to add staff, adjust pricing, renegotiate leases or justify expansion capital. The data often pays for itself in the first budget cycle by replacing expensive manual surveys.

Reduced circling emissions. For municipalities and ESG-reporting operators, measurable reductions in search-driving and idle time contribute to sustainability targets.

A note on ROI claims

You will see vendors claim specific payback periods like "ROI in 6 months." Honest ROI depends entirely on your traffic volume, your turn-away rate, your labor cost and your revenue per visit. We do not publish a blanket ROI figure because it would be a guess applied to your site. What we can do is model the ROI for your specific layout once we know your numbers. Ask our team for a site-specific estimate.

11. Evaluating vendors: the 15-question scorecard

Use these questions when comparing any two smart parking vendors, including IoTize. A good vendor answers every one without hedging.

Detection and accuracy

1	What detection technology do you use (lane counting, ultrasonic, radar, camera, magnetometer), and what is the expected accuracy at my site type?
2	How does the system handle accuracy drift over time (missed counts, sensor fouling, battery aging)?
3	Can I start with lane-level counting and add per-bay sensors later without replacing hardware?

Edge control and resilience

1	Does the system process data at the edge or only in the cloud? What happens to guidance if the internet goes down?
2	What protocols does the edge controller support (MQTT, HTTP, Modbus TCP, RS-485)?

Signage

1	What sign types are available (LED, flip-dot, per-bay indicators)? Can I mix types on the same system?
2	Can the sign content be updated remotely, and can I customize messages, languages and graphics?

Data and deployment

1	Where is my data stored? Can I export my full occupancy history at any time?

2	Do you support on-premises deployment, private cloud and SaaS? Are the features the same across all three?
3	What is the recurring software or licensing cost? Is it per device, per space, per site, or flat?

Integration

1	Can the system feed data into my existing BMS, SCADA, MES or mobile app? Do you provide documented APIs?
2	Does the system integrate with my existing barriers, gates and payment machines, or does it require its own access-control layer?

Installation and support

1	What does a typical installation timeline look like for my site type? Can the facility stay open during installation?
2	What is included in your maintenance and support agreement? What is the warranty period?

Scalability and lock-in

1	If I add a second site or triple my sign count, does the pricing model change? Can I move to a different vendor later without losing my hardware investment?

Scoring tip: For each question, mark green (clear, documented answer with a reference site), yellow (vague or "it depends" with no specifics), or red (unable to answer or restrictive). A vendor with more than two reds deserves scrutiny.

12. The IoTize smart parking product range

Four live products form a complete detect, decide, display system. Buy them together or one at a time.

IoT Entry/Exit Vehicle Counter

Role: Detect. Registers every vehicle entering and leaving at the lane for a live occupancy count.

Series: Custom

Starting price: From $249, quoted to your layout

Where it goes: Entrance and exit lanes of garages, gated lots, campus gates and toll points.

Why it matters: Counting at the choke point rather than at every bay delivers a reliable "spaces free" number with minimal installation. It is the fastest, most affordable way to move a lot from blind to guided.

Buy path: Request a quote at iotize.org/product/iot-entry-exit-vehicle-counter-parking/

Parking Guidance Gateway (IoT Edge Controller)

Role: Decide. Collects data, processes it at the edge, drives signs and streams to the cloud or your platform.

Series: Custom

Starting price: From $449, quoted to your layout

Where it goes: A field cabinet, electrical room or server closet on site.

Why it matters: Edge processing keeps guidance instant and resilient. The gateway is also the integration point for future per-bay sensors, so it future-proofs your investment.

Buy path: Request a quote at iotize.org/product/parking-guidance-gateway-edge-controller/

IoT Indoor LED Signage Display

Role: Display (indoors). Full-color LED panel showing counts, animated arrows, text and logos.

Series: Custom

Starting price: $999

Dimensions: 1000 by 200 mm (192 by 32 resolution)

Where it goes: Ceiling beams at ramp junctions, level entries and garage entrances, anywhere a driver makes a routing decision.

Why it matters: A driver processes a number and an arrow faster than a paragraph of text. One sign at the right junction changes the flow of an entire deck.

Buy path: View product at iotize.org/product/smart-iot-indoor-led-signage-display-192×32/

Smart Parking Flip-Dot Guidance Signage

Role: Display (outdoors, off-grid). Solar and battery powered, sunlight-readable, wireless.

Series: Custom

Starting price: $1,600

Display: 7 by 20 electromechanical flip-disc matrix. Customizable sizes.

Rating: IP65 (dust-tight, water-jet resistant)

Where it goes: Curbs, surface lot entrances, street-side poles, any location with no mains power.

Why it matters: Flip-dot discs are bistable: they hold their image with no power. The sign draws energy only at the moment of update and runs on solar with battery backup. That makes off-grid, no-trenching guidance practical at the street.

Buy path: View product at iotize.org/product/smart-parking-flipdot-guidance-signage-solar/

On the roadmap (not yet available)

IoT Parking Bay Occupancy Sensor. A per-space sensor for exact, bay-by-bay detection.

Bay-level red and green indicator lights. Mounted above each space for instant visual guidance.

Both are in development and are designed to integrate through the same Parking Guidance Gateway, so hardware purchased today will work with these products when they launch. Contact our team if bay-level guidance is on your plan.

13. Getting started with IoTize

Step 1: Map one entrance

Pick a single lane, gate or level to prove the system. A pilot on one entrance is the fastest way to see the value before committing to a full rollout.

Step 2: Talk to our team

Share your site plan or photos, answer the 12-point checklist (Section 8) and tell us which layout (Section 9) is closest to your site. Our team will design the system and quote it.

Step 3: Install detect, decide, display

Mount the Vehicle Counter, power up the Gateway, hang the sign. Commissioning is typically completed in a single visit for a single-entrance pilot.

Step 4: Watch it live

Confirm the live count and guidance on the dashboard. Validate accuracy against a manual count over one peak period. Adjust thresholds if needed.

Step 5: Scale with confidence

Roll the same building blocks out to more levels, more entrances, more curbs and more sites. The platform, the dashboard and the data model stay the same.

How to reach us

- **Web:** iotize.org
- **Smart parking products:** iotize.org/product-category/smart-parking/
- **All products:** iotize.org/products/
- **Contact:** iotize.org/contact/
- **Solutions:** iotize.org/solutions/smart-parking-solutions/

14. Glossary

APGS (Automated Parking Guidance System). A system that uses sensors and signs to guide drivers to available spaces, as distinct from access control or enforcement.

Bay-level detection. Sensing whether an individual marked parking space is occupied or free, typically using an overhead ultrasonic, radar or camera sensor, or an in-ground magnetometer.

Bistable display. A display technology (such as flip-dot) where each element holds its state with no power. Energy is consumed only during a state change.

BMS (Building Management System). The central control system for a building's mechanical, electrical and plumbing systems. Parking data can feed into a BMS for unified facility monitoring.

Count-in / count-out. The method of tracking occupancy by counting vehicles entering and leaving through a choke point.

Decision point. Any location inside a parking facility where a driver must choose between two or more routes (ramp splits, T-junctions, level entries). Each decision point is a candidate for a guidance sign.

Edge controller. A device that processes sensor data locally, on-site, rather than sending it to a remote cloud for processing. Reduces latency and maintains functionality during internet outages.

Flip-dot. An electromechanical display technology using small discs that flip between two colors when pulsed. Sunlight-readable, low power, bistable.

IP65. An ingress protection rating meaning dust-tight and protected against water jets. Standard for outdoor parking signage.

Lane-level detection. Sensing vehicles at the entrance or exit lane of a facility to determine total occupancy, as opposed to bay-level detection.

LPR / ANPR (License Plate Recognition / Automatic Number Plate Recognition). Camera-based identification of vehicle registration plates. Used for access control and enforcement, not guidance.

MQTT. A lightweight messaging protocol commonly used in IoT for telemetry. Supported by IoTize devices for cloud and platform integration.

Modbus TCP. An industrial communication protocol used in SCADA, BMS and factory automation systems. Supported by IoTize devices for direct integration.

Occupancy. The number or percentage of parking spaces currently in use at a facility or within a zone.

On-premises (on-prem). A deployment model where software and data storage run on the customer's own servers, within their own network, rather than on the vendor's cloud.

SaaS (Software as a Service). A deployment model where the vendor hosts the software and the customer accesses it through a browser. Faster to deploy, but data resides on the vendor's infrastructure.

SCADA (Supervisory Control and Data Acquisition). An industrial control system used in manufacturing, utilities and large facilities. Parking data can stream into SCADA for unified operations monitoring.

From a blind lot to a guided one.

Your data, your way.

IoTize.ORG | Field-proven industrial IoT since 2015 | Designed, assembled and tested in-house | Karachi, Pakistan, shipping worldwide

iotize.org | iotize.org/contact/