

Market Research and Competitive Analysis of the Smart Parking Management Systems

Phase 4: Competitive Analysis

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for

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Problem Statement: What if drivers are offered parking spots that are more affordable and secure, and parking providers are offered real-time dynamic parking pricing and a more reliable payment system?

Part 1 – Competitor Comparison Matrix

Competitor	Features	Pricing	Target Market	Tech Stack	Strengths	Weaknesses
<u>SpotHero</u>	1) Advance garage reservations 2) Price comparison 3) Mobile payments	Dynamic pricing; discounts offered	Daily commuters, eventgoers, tourist	iOS, Android, Web; integrates with garage APIs	1) Extensive NYC coverage 2) User-friendly interface 3) Real-time availability	1) Limited on-street parking options 2) Dependent on garage partnerships
<u>BestParking</u>	1) Garage and lot search 2) Rate comparison 3) Reservation system	Variable; some flat-rate deals	Budget-conscious drivers, tourists	iOS, Android, Web	1) Comprehensive rate data 2) Broad garage network	1) Less emphasis on real-time availability 2) Limited street parking info
<u>ParkMobile</u>	1) Metered parking payments 2) Permit management 3) Event parking	Pay-as-you-go; transaction fees	Urban drivers, municipalities	iOS, Android, Web; integrates with city systems	1) Official NYC partner 2) Wide adoption 3) Integration with city infrastructure	1) Limited garage booking capabilities 2) User interface can be complex
<u>SpotAngels</u>	1) Street parking maps 2) Regulation alerts 3) Community updates	Free with optional premium features	Local drivers, residents	iOS, Android, Web	1) Real-time street parking info 2) Community-driven data	1) No reservation capabilities 2) Relies on user-contributed data
<u>Metropolis</u>	1) Camera-based parking 2) License plate recognition 3) Automated billing	Subscription and usage-based fees	Parking garage operators, municipalities	Proprietary AI, LPR systems; cloud-based platform	1) Seamless, contactless experience 2) Reduces need for human attendants	1) High implementation cost 2) Privacy concerns with surveillance tech

Part 2 – SWOT Analysis

1) SpotHero

SpotHero - SWOT Analysis

Strengths	Weaknesses
- Largest garage network - Real-time availability - Deep discounts - Trusted brand	- No street parking - Dependent on partner data - Quality inconsistency
Opportunities	Threats
- Partner with cities for curb access - Expand last-minute bookings	- ParkMobile expanding - EV-specific parking demand rising

2) BestParking

BestParking - SWOT Analysis

Strengths

- Strong rate database
 - Simple UI
 - Budget friendly

Weaknesses

- No real-time data
 - Limited street options
 - Mobile app less advanced

Opportunities

- Add real-time garage data
 - EV partnerships

Threats

- Rivals offering real-time street data
 - Risk of obsolescence

3) ParkMobile

ParkMobile - SWOT Analysis

Strengths

- NYC meter integration
 - Wide public use
- Simple on-street payment

Weaknesses

- Poor garage booking
- Confusing interface
- Transaction fees

Opportunities

- Expand to residential lots
- Launch loyalty rewards

Threats

- Cities building own apps
- Newcomers with better UX

4) SpotAngels

SpotAngels - SWOT Analysis

Strengths

- Real-time street parking
- Regulation alerts
- Community-driven

Weaknesses

- No reservations
- User data dependent
- Inconsistency

Opportunities

- Partner with local businesses
- Real-time ticket data tie-up

Threats

- Bigger apps adopting community models
- Scalability challenges

5) Metropolis

Metropolis - SWOT Analysis

Strengths	Weaknesses
- Seamless LPR parking - No app needed - AI-driven automation	- High setup cost - Privacy concerns - Limited retrofit sites
Opportunities	Threats
- Expand curbside LPR - Subscription models	- Stricter privacy laws - Consumer distrust in surveillance

Part 3 – Analysis of Differentiators

Feature	Why it is Unique vs. Competitors
<i>Real-time physical vehicle sensing (IR + BLE + RFID)</i>	Competitors depend mostly on garage API reports, crowdsourced data, or license plate detection after entry. They don't physically verify the vehicle presence in real-time before booking/charging.
<i>Sidewalk-mounted or curbside IoT device</i>	None of the major competitors offer an actual physical sensing device for public parking spots. Opportunities to scale to municipal and private curbs easily.
<i>Automated violation detection + billing without manual ticketing</i>	ParkMobile handles legal payments but not violation automation. I can detect overstays or improper parking automatically.
<i>Secure reservation with sensor verification</i>	SpotHero and ParkMobile offer reservations but cannot physically validate that the booked space is occupied or not.
<i>Affordable Modular Hardware (ESP32-CAM + Sensors)</i>	Metropolis offers smart parking hardware — but it's expensive, proprietary, and primarily for garages. My proposed design is affordable and flexible even for curbside parking.
<i>Dynamic pricing based on occupancy + reservation</i>	While some apps dynamically show prices, dynamic occupancy-driven pricing using live sensor data is not standard in NYC yet.

Why are Competitors Currently Winning?

Area	Who's Winning	Why They're Winning
<i>Garage Reservations</i>	SpotHero, BestParking	They have massive partner networks and reliable user bases for off-street parking.
<i>Street Parking Payments</i>	ParkMobile	Deep integration with NYC DOT meters and on-street payment flow.
<i>Community Real-time Street Insights</i>	SpotAngels	Crowdsourced alerts for street parking rules, ticket avoidance.
<i>Luxury AI-based Automation</i>	Metropolis	Seamless entry/exit with license plate cameras and no action needed from the user.
<i>Public Awareness & Branding</i>	ParkMobile, SpotHero	High trust among NYC drivers due to wide adoption and marketing.

Potential Areas to Outperform

Strategy	Opportunity
<i>Bringing physical, real-time verification to street parking</i>	None of the competitors combine sensor validation + RFID identity + camera optionality at curb level affordably.
<i>Winning curbside deployment</i>	Target where garages aren't practical — sidewalks, small lots, residential areas, mixed-use spaces.
<i>Automating enforcement for cities</i>	Offer NYC municipalities and private operators the ability to detect overstays and violations automatically, reducing labor costs and disputes.
<i>Affordable smart infrastructure</i>	Where Metropolis offers expensive proprietary LPR hardware, I propose to offer cost-effective, quick-install devices — critical for public-private pilots.
<i>Dynamic pricing powered by true live occupancy</i>	None of the apps or garages truly adjust price minute-to-minute based on real parking behavior; they depend on preset rates.
<i>Open, modular platform</i>	While others lock users into apps, I could allow open data API access — helping fleet managers, delivery companies, and urban planners customize it to their needs.