

**GE5100**  
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**PRODUCT DEVELOPMENT FOR ENGINEERS**

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**Market Research Report**

**SmartParkIQ- A smarter way to park**

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# Background Research

## 1. Smart Parking Technology Evolution

Smart parking technology evolution provides the foundation for SmartParkIQ's innovative approach, demonstrating how our integrated insurance model represents the next logical step in parking technology advancement.

The evolution from mechanical systems (1905 Paris Garage) to sensor-based systems (2000s) to current AI-powered platforms shows a clear progression toward comprehensive user protection. Early smart parking sensor technology began gaining traction in the early 2000s, especially in malls and shopping centers, with the first robotic garage built in 2002 in Hoboken, New Jersey.

While first-generation smart parking focused on availability detection and second-generation systems added mobile payments, SmartParkIQ represents innovation by integrating predictive analytics with insurance protection. Current smart parking systems collect data from IoT technology and AI to deliver a better overall parking experience, but none offer the comprehensive protection model along with pre-booking options that SmartParkIQ provides.

Modern smart parking systems utilize three primary technologies that directly support SmartParkIQ's architecture: ground sensor technology for real-time availability, camera-based systems for license plate recognition, and counter technology for occupancy management. Our platform leverages these existing infrastructures while adding predictive insurance algorithms and dynamic pricing intelligence.

**Market Validation:** The global smart parking industry was valued at \$7.39 billion in 2023 and is projected to reach \$44.9 billion by 2032, demonstrating strong market demand for innovative parking solutions that SmartParkIQ can capture through its differentiated approach.

## 2. Mobile Payment Integration and SmartParkIQ's Insurance Innovation

The evolution of mobile parking payments creates the technical foundation for SmartParkIQ's integrated insurance model, demonstrating how payment platforms can expand beyond transactions to comprehensive protection services.

**Payment Technology Foundation:** Mobile parking payment concepts emerged around 2001 when connectivity with mobile data and texts allowed drivers to start paying for their parking spaces with cell phones. SMS pay-by-phone parking was first introduced in Croatian capital

Zagreb in 2001 under the name M-parking, becoming the largest system in Europe by 2004 with over 130,000 users.

**SmartParkIQ's Insurance Integration Opportunity:** While existing mobile payment systems focus solely on parking transactions, SmartParkIQ's innovation lies in seamlessly integrating micro-insurance policies within the payment flow. Mobile payments in parking are fast, secure and easy with technologies like Google Pay, Visa Checkout, Apple Pay and Masterpass, providing the technical infrastructure for our insurance integration.

**Market Gap Analysis:** Current mobile parking payments address convenience but not protection. According to Deloitte's 2015 Global Mobile Consumer Survey, 19 percent of U.S. consumers already have paid for parking via mobile, indicating strong adoption of digital parking solutions, yet none offer vehicle protection services that SmartParkIQ provides.

**Technical Implementation Advantages:** Modern mobile payment infrastructure supports SmartParkIQ's insurance integration through existing secure payment channels, API integrations, and user authentication systems. Our platform builds upon proven payment technologies while adding unique value through risk assessment algorithms and instant coverage activation.

### **3. Machine Learning Applications in Parking Prediction - Technical Foundation for SmartParkIQ**

Machine learning research in parking systems provides the technical validation for SmartParkIQ's predictive pricing algorithms and demonstrates the feasibility of our AI-powered recommendation engine.

**ML Algorithm Validation for SmartParkIQ:** Recent research developed three regression-based ML models - random forest, gradient boosting, and LightGBM - that demonstrated superior predictive capability using parking data from 2019 to 2021. These same algorithms form the foundation of SmartParkIQ's dynamic pricing intelligence, validated through academic research.

**Predictive Accuracy for Business Model:** Machine learning algorithms including Random Forest, K-Nearest Neighbors, and Naïve Bayes have proven effective for parking space prediction, with studies showing that less complex algorithms often outperform complex ones in terms of prediction accuracy. This research validates SmartParkIQ's approach to using proven, efficient algorithms rather than overly complex systems.

**Data Integration Relevance:** Modern smart parking systems leverage IoT, machine learning, and AI convergence to predict parking occupancy, optimize space usage, and implement dynamic

pricing strategies through sophisticated algorithms and data processing techniques. SmartParkIQ's architecture directly implements these research-validated approaches.

**Urban Impact Supporting Business Case:** Studies reveal that between 20 and 30% of urban traffic jams result from drivers searching for parking spaces, providing strong market justification for SmartParkIQ's predictive recommendation system that reduces search time and urban congestion.

**Technical Implementation Path:** Research demonstrates that combining temporal dependencies, autoregressive modeling, and real-time data integration achieves high prediction accuracy. SmartParkIQ's technical architecture incorporates these proven methodologies while adding the unique element of insurance risk assessment algorithms.

## Industry Research

### Competitor Analysis

#### *1. ParkWhiz*

##### **Company Information:**

- **Founded:** 2006 by Aashish Dalal and Jon Thornton in Chicago, Illinois
- **Size:** Approximately 50-100 employees (significant reduction from previous years)
- **Revenue:** Estimated \$13-25M annually (conflicting data sources show wide range)
- **Time on Market:** 19 years (since 2006)
- **Location:** 208 S. Jefferson St., Chicago, Illinois, United States
- **Funding:** \$25M Series D led by NewSpring Capital, additional \$5M from Amazon Alexa Fund
- **Current Status:** Now operates under the Arrive Mobility brand, part of FlashParking Inc.

##### **Product Offerings:**

- **Summary:** Digital parking reservation platform serving 190+ cities in North America, specializing in event and venue parking with advance booking capabilities
- **Key Features:** Pre-booking system, price comparison, integration with Ford vehicles, Amazon Alexa voice booking, partnership with major venues

- **Advantages:**
  - Strong brand partnerships (Ford, Ticketmaster, Madison Square Garden, Groupon)
  - Event parking specialization with proven track record
  - Voice integration capabilities through Amazon Alexa
  - Established presence in major markets (Chicago, NYC, Boston)
- **Disadvantages (SmartParkIQ Opportunities):**
  - **No protection services** - purely booking focused without insurance or damage coverage
  - **Static pricing** - no surge pricing predictions or alerts for users
  - **Poor user experience** - Trustpilot rating of 1.6/5 with complaints about overcharging and location accuracy
  - **Limited differentiation** - commodity booking service vulnerable to feature expansion by competitors

**SmartParkIQ Advantage:** Our integrated insurance model and predictive pricing intelligence directly address ParkWhiz's limitation of being a basic booking platform without user protection.

## ***2. SpotHero***

### **Company Information:**

- **Founded:** 2011 by Mark Lawrence and Jeremy Smith in Chicago, Illinois
- **Size:** 201-500 employees (estimated 287 employees)
- **Revenue:** \$25-100M annually (estimated \$77.4M based on industry analysis)
- **Time on Market:** 14 years (since 2011)
- **Location:** 125 S Clark St, Chicago, Illinois, United States
- **Funding:** \$118M total funding through Series D (August 2019), led by Macquarie Capital
- **Market Position:** Largest parking network in North America

### **Product Offerings:**

- **Summary:** Leading digital parking marketplace with 9,000+ locations across 300+ cities in U.S. and Canada, focusing on off-street parking reservations
- **Key Features:** SpotHero IQ dynamic pricing for operators, business solutions, integration with Google/Apple Maps/Lyft, developer platform API
- **Advantages:**

- Market dominance with largest network (9,000+ locations)
- Strong technology partnerships (Google, Apple, Lyft, Waze)
- Dynamic pricing capabilities for operators (SpotHero IQ)
- Comprehensive business solutions and corporate services
- Recent acquisitions expanding market reach (Parking Panda, ParkPlease, Rover Parking)
- **Disadvantages (SmartParkIQ Opportunities):**
  - **No user insurance** - focuses on operator revenue optimization without user protection
  - **Limited user-facing price prediction** - SpotHero IQ helps operators but doesn't alert users about surge pricing
  - **Booking-centric model** - doesn't address parking anxiety or vehicle safety concerns
  - **Volume dependency** - revenue model relies on booking volume rather than value-added services

**SmartParkIQ Advantage:** While SpotHero has market reach, our focus on user protection and predictive pricing alerts addresses the anxiety and risk management aspects they ignore.

### ***3. ParkMobile***

#### **Company Information:**

- **Founded:** 2008 by Albert Bogaard, originally in Netherlands
- **Size:** 51-200 employees (estimated 210 employees)
- **Revenue:** \$26.7-38.9M annually (multiple source estimates)
- **Time on Market:** 17 years (since 2008)
- **Location:** Atlanta, Georgia, United States
- **Ownership:** Acquired by EasyPark Group (Sweden) in 2021, previously BMW-Daimler joint venture
- **Market Reach:** 500+ cities, 40M+ users, 3,000+ locations

#### **Product Offerings:**

- **Summary:** Leading smart parking and mobility solutions provider focusing on municipal partnerships and on-street parking payments
- **Key Features:** Zone parking payments, ParkMobile 360 management platform, municipal permit solutions, airport/university partnerships
- **Advantages:**

- Extensive municipal relationships (500+ cities)
- Government partnership expertise and regulatory compliance
- Comprehensive service portfolio (on-street, off-street, permits, events)
- Strong institutional presence (150 universities, 20 airports)
- BMW vehicle integration capabilities
- **Disadvantages (SmartParkIQ Opportunities):**
  - **Payment-only focus** - no predictive features or user protection services
  - **Security vulnerabilities** - major data breach in 2021 affecting 21M users damaged trust
  - **Limited pricing intelligence** - no surge prediction or cost optimization for users
  - **Municipal dependency** - heavy reliance on government contracts creates business risk

**SmartParkIQ Advantage:** Our private-sector focus with insurance partnerships avoids the regulatory dependencies and security vulnerabilities that challenge ParkMobile, while offering protection services they don't provide.

## Summary

### Why These Competitors Were Chosen:

**ParkWhiz** represents the event and venue parking specialization market with strong brand partnerships. However, their poor user satisfaction (1.6/5 Trustpilot rating) and basic booking model create clear opportunities for SmartParkIQ's protection-focused approach to capture dissatisfied users seeking better value and security.

**SpotHero** is the market leader with the largest network and strongest technology integrations, making them our primary competitive threat. Their recent SpotHero IQ dynamic pricing shows they're innovating, but their focus remains on operator revenue optimization rather than user protection - SmartParkIQ's insurance integration addresses the user-side gap they've missed.

**ParkMobile** dominates municipal and government partnerships with extensive city relationships. While their government focus differs from our private-sector strategy, their 2021 data breach (21M users) damaged user trust in parking apps, creating an opportunity for SmartParkIQ to position itself as a secure, protection-focused alternative.

## **What We're Most Worried About:**

**SpotHero's Resource Advantage and Rapid Innovation Capability:** With \$77.4M revenue, \$118M in funding, and 287 employees, SpotHero has significant resources to rapidly implement features similar to our insurance integration. Their demonstrated ability to quickly integrate with major platforms (Google Maps, Apple Maps, Lyft) and launch products like SpotHero IQ shows they can move fast. If they recognize the value of our insurance model, they could potentially develop or acquire similar capabilities.

**Market Consolidation and Partnership Blocking:** All three competitors have acquisition histories and significant funding. They could potentially acquire insurance technology companies or partner exclusively with major insurance providers, blocking SmartParkIQ's access to key partnerships. SpotHero's \$118M funding round specifically gives them acquisition capabilities.

**Network Effects and Switching Costs:** SpotHero's 9,000+ locations and ParkMobile's 500+ city relationships create strong network effects. Users are less likely to switch apps when their current platform already has broad coverage. Parking operators may be reluctant to add another platform when they already have established relationships.

**Technology Platform Integration Speed:** Both SpotHero and ParkMobile have proven ability to integrate with major technology platforms. SpotHero's partnerships with Google, Apple, and automotive companies could enable them to rapidly deploy competitive features if they decide our insurance model is valuable.

## **SmartParkIQ's Competitive Response Strategy:**

**Differentiation Through Protection Focus:** While competitors focus on booking efficiency, SmartParkIQ addresses parking anxiety through comprehensive protection. This emotional value proposition is harder to replicate than technical features.

**Insurance Partnership Moats:** By establishing exclusive relationships with insurance providers early, SmartParkIQ can create barriers to competitive entry in the protection space.

**User Experience Excellence:** Competitors have user satisfaction issues (ParkWhiz's 1.6/5 rating, ParkMobile's security breach). SmartParkIQ can win market share by providing superior user experience focused on trust and protection.

**Niche Market Entry:** Rather than competing directly on network size, SmartParkIQ can establish dominance in the protection/insurance segment and expand from this defensible position.



## **Audience Personas:**

### **1. Urban Professional Driver**

- Primary target user focused on convenience and protection
- Values time efficiency and risk management
- Frustrated by unreliable apps and vehicle damage concerns

### **2. Independent Parking Garage Owner**

- B2B customer seeking revenue optimization
- Values data-driven insights and operational efficiency
- Frustrated by underutilized spaces and lack of customer data

### **3. Insurance Company Product Manager**

- Strategic partnership target for our insurance integration
- Values innovation and new revenue streams
- Frustrated by limited customer touchpoints outside traditional insurance

### **4. Corporate Fleet Manager**

- Enterprise customer managing employee parking benefits
- Values cost control and process automation
- Frustrated by complex expense reporting and budget unpredictability

## **10 Question Marketing Survey:**

With the aim of extracting as much information from as many people as possible to help establish the project, following questionnaires have been developed:

1. How often do you drive and need parking in a week?
2. What type of parking do you usually use? (Street, Garage, Lot, Other)
3. Have you ever received a ticket or been towed due to unclear parking rules?
4. How much do you typically spend on parking weekly
5. What frustrates you most when looking for parking?
6. Would you prefer an app that verifies legal spots and warns of towing risk?
7. How important is real-time availability data in a parking app?
8. Would a price comparison feature influence your choice of parking?
9. What features would make you trust a new parking app?

10. Would you use an AI-powered app that predicts cheaper or safer options nearby?

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