



Polaris Wireless

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**ENABLING  
TECHNOLOGY  
LEADER**

*Leveraging Vital Technology to Enhance  
Products and Applications*

*RECOGNIZED FOR BEST PRACTICES IN THE  
GLOBAL LOCATION DETERMINATION  
TECHNOLOGIES INDUSTRY*

F R O S T & S U L L I V A N

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**Best Practices Criteria for World-class Performance**

Frost & Sullivan applies a rigorous analytical process to evaluate multiple nominees for each recognition category before determining the final recognition recipient. The process involves a detailed evaluation of best practices criteria across two dimensions for each nominated company. Polaris Wireless excels in many of the criteria in the location determination technologies space.

RECOGNITION CRITERIA	
<i>Technology Leverage</i>	<i>Customer Impact</i>
Commitment to Innovation	Price/Performance Value
Commitment to Creativity	Customer Purchase Experience
Stage Gate Efficiency	Customer Ownership Experience
Commercialization Success	Customer Service Experience
Application Diversity	Brand Equity

**The Transformation of the Location Determination Technologies Industry**

The location determination technologies industry is undergoing rapid transformation, driven by technological advancements and the growing need for precise location-based services. Applications extend beyond navigation and tracking into critical sectors such as public safety, critical infrastructure, and smart cities.

The market is becoming increasingly competitive as startups and digital business models challenge established players. Innovations in positioning systems, including ultra-wideband and computer vision technologies, are enabling improved navigation, advanced driver assistance systems, and more reliable traffic information. However, challenges remain around balancing accuracy and cost, particularly in high-density environments and indoor locations where high-precision performance is often inadequate but critical for applications aligned to smart city infrastructure and public safety.

**Shortcomings of Standalone Location Determination Technologies Remain Obstacles**

Traditional location-based services (LBS) generally leverage different techniques to determine the location of people and objects through mobile phones and connected devices; however, these technologies include tradeoffs in overall accuracy and functionality, particularly when used as standalone location services.

- Global positioning system (GPS) technology can provide an accurate location in blue sky environments, but provides sub-optimal accuracy during bad weather conditions, obscured line-of-sight, and indoor environments.
- Conventional indoor positioning solutions experience time lags between the event and reporting and are limited in their proximity tracking capabilities, making location tracking of moving targets inaccurate (common during 9-1-1 calls).
- Wi-Fi (i.e., geomagnetic sensors) can provide better indoor accuracy than GPS but consumes batteries quickly, making it less ideal for standalone use. Furthermore, indoor location solutions typically require hardware components, increasing costs and overall difficulty of management.

Most solutions depend on proprietary platforms for specific devices, operating systems, or networks. Traditional LBS solutions often manage services using a “fallback tree” method, attempting to use one type of location determination technology (e.g., GPS) and if that does not work, falling back upon another type (e.g., cell ID). As a result, location accuracy is limited to only that of one type of location technology.

In this environment, Frost & Sullivan recognizes that to maintain a competitive advantage and maximize impact as technologies advance and customer behaviors evolve, companies in this space need to focus on continuous innovation and collaboration. Investing in research and development is essential, particularly in advancing technologies that improve accuracy in high-density environments, lower costs, and enable intelligent vertical location solutions. Strengthening GIS platforms also plays a key role, as enhanced integration with critical services and scalable vertical location capabilities can significantly improve mission critical applications.

### **Polaris Wireless: Pioneering High-Accuracy Location Intelligence**

Founded in 1999 and headquartered in California, United States (US), Polaris Wireless (Polaris) is a leader in high-accuracy wireless location solutions for public safety, government, and commercial applications. The company delivers advanced XY and Z-axis technologies that enable precise indoor and outdoor positioning, supporting a range of commercial use cases and supporting governments in addressing security challenges.

Polaris entered the public safety market in 2003 in response to the Federal Communications Commission’s (FCC) E911 Phase II mandate, introducing a software-based RF pattern matching solution that required no software in devices or hardware in carrier networks solution that required no hardware and delivered high accuracy across second generation to fifth generation networks. The company achieved 26 US deployments with Tier 2 and Tier 3 carriers.<sup>1</sup> Polaris pivoted its focus to national security, securing multimillion-dollar contracts in the Middle East, Southeast Asia, and North Africa. Polaris provides intelligence agencies across the globe with location intelligence platforms that host 30+ applications, including public safety, law enforcement and intelligence agencies in customer countries.<sup>2</sup>

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<sup>1</sup> Frost & Sullivan’s Best Practices Research Interview of Polaris Wireless (August 2025)

<sup>2</sup> Ibid.

## Advancing Location Intelligence Through Research, Innovation, and Creativity

Innovation drives Polaris' growth strategy. Its PhD-led research teams from top US engineering schools develop proprietary core technology that has been validated through trials published by various government entities and trade associations, including the FCC and the Cellular Telecommunications Industry Association (CTIA). This commitment to measurable outcomes, transparency, ethics, and credibility sets Polaris apart from competitors that often withhold performance data.

Under Chief Executive Officer Manlio Allegra's leadership, Polaris prioritizes product and technology development over marketing or lobbying, enabling its performance and tangible outcomes to

demonstrate its technological leadership. The company holds approximately 135 granted patents in XY and Z-axis location technologies, with expertise in vertical positioning.<sup>3</sup> By identifying performance gaps and collaborating with partners, Polaris continues to enable complex, specialized use cases in national security, critical infrastructure, public safety, and the Internet of Things (IoT).

Polaris identified an emerging need for indoor capabilities, particularly for vertical positioning (Z-axis), pioneering the use of barometric pressure sensors in mobile devices to pinpoint a phone's location within a building. Its awarded patents in this area date back to 2014 and filings, establishing precedence and helping to shape FCC's E911

*"Polaris addresses three sources of accuracy impairments: weather reference, building effects, and sensor bias. Its differentiator lies in compensating for sensor bias unique to each device. The system measures and continuously updates compensation parameters, accounting for manufacturing tolerances or physical wear and tear, such as damage from drops."*

**- Marcos Ainchil,  
Best Practices Research Analyst**

standards.

Polaris's indoor solution delivers location data and height above ellipsoid (height above ground), along with reverse geocoding that maps buildings and links device coordinates to civic addresses. The company has already mapped most buildings in downtown San Francisco. Its engineers are also advancing indoor positioning through machine learning, achieving increasingly precise results with extremely low battery consumption, an advantage for IoT devices. Emerging applications include contextual location, converting raw measurements into civic addresses, and enabling analytics for broader government and commercial use cases. Its Z-axis technology was instrumental in defining the FCC's E911 metric of three-meter vertical location accuracy, demonstrating industry influence.

A third strategic area emerged during the COVID-19 pandemic: infrastructure protection. This initiative addresses illicit mobile phone use in prisons, a \$5 billion annual global problem.<sup>4</sup> More specifically, inmates often use smuggled phones to direct criminal networks, while traditional jamming solutions disrupt service indiscriminately both inside and outside prisons. Polaris developed a geofencing-based alternative requiring no in-prison hardware. Software integrated into carrier infrastructure and operated

<sup>3</sup> Ibid.

<sup>4</sup> Frost & Sullivan's Best Practices Research Interview of Polaris Wireless (August 2025)

in a secure cloud environment, the system automatically blocks phones inside the geofence while leaving others unaffected. It also identifies external parties communicating with inmates, enabling targeted disruption of criminal networks. Importantly to public safety, the Polaris system still allows 911 calls for blocked devices. Additionally, when a blocked device exits the geofenced area, it will be automatically unblocked (for example, this would apply to visitors or workers). This solution has been deployed in multiple networks in Latin American and Central American countries, with trials underway in Europe, the Middle East, and Southeast Asia.

The same technology applies to sensitive facilities such as military bases, power plants, and embassies. Early deployment challenges in geofence accuracy were resolved through collaboration with a leading US university, pairing PhD students with Polaris engineers to enhance precision. This strengthened both the core technology and application, ensuring reliable enforcement without disruption caused by jamming.

### Enhancing Location Determination Accuracy through Innovation

For its vertical location solution, Polaris addresses three sources of accuracy impairments: weather reference, building effects, and sensor bias. Its differentiator lies in compensating for sensor bias unique to each device. The system measures and continuously updates compensation parameters, accounting for manufacturing tolerances or physical wear and tear, such as damage from drops.

The weather reference network combines public data, third-party sources, partner-provided data, and a limited number of proprietary weather stations. These proprietary stations primarily calibrate other sources, minimizing infrastructure needs while ensuring scalability. Coverage began with the FCC-mandated top 25 and 50 markets, and more recently expanding to nationwide reach and international operations. The architecture supports diverse implementations, including advanced mobile location for feature phones and software development kit or application programming interface integration for IoT devices. The lightweight Z-axis client is compatible with multiple operating systems, including Android Open Source Project and KaiOS, with arrangements in place with chipset providers and operating system vendors. The solution works seamlessly across carriers and devices, providing smooth outdoor and indoor transitions without prior building maps. This flexibility and cost-effective design differentiate Polaris from competitors, making its technology adaptable to a variety of use cases, including public safety, critical infrastructure, commercial LBS, and IoT applications.

### A Culture that Cultivates Innovation

Polaris sustains its culture of innovation through consistent investment in research and development, collaborations with universities, and partnerships with technology providers. The company's leadership fosters creativity by encouraging experimentation and supporting patent development, generating a steady flow of groundbreaking ideas and long-term employee engagement.

The company uses industry-standard methods to advance concepts from feasibility to productization, supported by a small but agile cross-functional team. This process has delivered notable achievements, such as being first to market with a Z-axis product well before the FCC mandate. Familiarity with emerging tools allows the team to engage customers on evolving requirements, ensuring Polaris remains at the forefront of innovation.

By delivering accurate, scalable, and flexible solutions, Polaris continues to disrupt legacy technologies while addressing complex challenges. Its innovations extend beyond compliance, enabling unique and transformative capabilities for public safety, government, and commercial markets worldwide.

### Enhancing Customer Value Through Experience, Service, and Innovation

A key innovative differentiator for Polaris is its barometric sensor-based vertical location technology, developed well ahead of regulatory mandates. The solution requires only a lightweight client on the device, with no firmware changes, and can integrate multiple inputs for scalable, flexible deployments. Independent testing, including CTIA Stage Z trials in 2018, confirmed FCC compliance for both XY and Z positioning. The company's engineering culture emphasizes readiness for public testing, with results openly shared to encourage industry collaboration and guide investment priorities.

Polaris is open to independent testing of its technology but has grown cautious of extended evaluation cycles that fail to translate into commercial opportunities. The company has emphasized Federal Communication Commission filings that the lack of meaningful rewards in the US public safety market discourages continued investment, despite the importance of deploying the most advanced capabilities in emergency response. For certain Tier 1 carriers, Polaris' technology has already undergone rigorous

*"The company's core value proposition lies in delivering technology that works as advertised, provides nationwide coverage at a lower cost, and offers adaptable implementation to meet diverse customer requirements. Through this combination of flexible pricing, proven technology, responsive support, and long-term engagement, Polaris delivers exceptional purchase and ownership experiences while reinforcing its competitive technology differentiators."*

**- Brent Iadarola,  
Vice President, ICT**

public safety testing, with well-documented indoor accuracy performance. This existing validation could accelerate adoption in adjacent markets, such as IoT, without requiring the prolonged testing periods typically associated with new deployments. The company sees this as a potential opportunity to leverage proven performance in one application to streamline market entry in others. Polaris prioritizes a seamless purchase experience. Its development team collaborates closely with customers to provide full end-to-end implementation, ensuring seamless and effective technology integration. This approach has fostered long-term customer relationships, with software licenses being renewed across successive products. Its strong track record of repeat business serves as a strong validation of both technology and

service quality.

Customer satisfaction is a main priority for the company. It addresses the price sensitivity of commercial LBS markets through flexible pricing models for z-axis and 3D location technology, allowing customers to adopt solutions tailored to their specific business needs. The company's core value proposition lies in delivering technology that works as advertised, provides nationwide coverage at a lower cost, and offers adaptable implementation to meet diverse customer requirements. Through this combination of flexible pricing, proven technology, responsive support, and long-term engagement, Polaris delivers exceptional purchase and ownership experiences while reinforcing its competitive technology differentiators.

Polaris ensures a high-quality service experience by engaging with customers throughout the entire product lifecycle, from initial purchase through implementation and ongoing support. The company maintains regular contact to ensure customers remain satisfied with both products and service. To uphold high standards, Polaris Wireless employs an industry-standard ticketing system with clear escalation paths, and it regularly engages customers through training sessions and roadmap presentations. These mechanisms ensure customer feedback informs continuous improvement and strengthens service quality.

Polaris places strong emphasis on building and strengthening its brand reputation. The company positions itself as a leading innovator in wireless location technology while emphasizing commitment to its customers. By demonstrating and commercializing technology ahead of the FCC's indoor location requirements, Polaris not only established benchmarks for the industry but also earned recognition from customers for anticipating and meeting their evolving needs. Through consistent engagement, robust support systems, and an innovation-driven brand, Polaris has reinforced customer trust, loyalty, and long-term business sustainability.

## Conclusion

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Polaris Wireless (Polaris) has an unwavering commitment to innovation, a research-driven culture, and a customer-focused approach. By pioneering high-accuracy XY and Z-axis technologies, the company has consistently shaped standards while setting industry benchmarks for indoor and vertical positioning. Its ability to translate advanced research into scalable, flexible, and user-friendly solutions has enhanced location determination capabilities and opened new opportunities in national security, critical infrastructure, public safety, and commercial IoT markets. Its proven track record of customer loyalty, long-term partnerships, and groundbreaking achievements helps Polaris redefine what is possible in wireless location intelligence.

With its strong overall performance, Polaris Wireless earns Frost & Sullivan's 2025 Global Enabling Technology Leadership Recognition in the location determination technologies industry.



## What You Need to Know about the Enabling Technology Leadership Recognition

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Frost & Sullivan's Enabling Technology Leadership Recognition is its top honor and recognizes the market participant that exemplifies visionary innovation, market-leading performance, and unmatched customer care.

### Best Practices Recognition Analysis

For the Enabling Technology Leadership Recognition, Frost & Sullivan analysts independently evaluated the criteria listed below.

#### Technology Leverage

**Commitment to Innovation:** Continuous emerging technology adoption and creation enables new product development and enhances product performance

**Commitment to Creativity:** Company leverages technology advancements to push the limits of form and function in the pursuit of white space innovation

**Stage Gate Efficiency:** Technology adoption enhances the stage gate process for launching new products and solutions

**Commercialization:** Company displays a proven track record of taking new technologies to market with a high success rate

**Application Diversity:** Company develops and/or integrates technology that serves multiple applications and multiple environments

#### Customer Impact

**Price/Performance Value:** Products or services offer the best ROI and superior value compared to similar market offerings

**Customer Purchase Experience:** Purchase experience with minimal friction and high transparency assures customers that they are buying the optimal solution to address both their needs and constraints

**Customer Ownership Excellence:** Products and solutions evolve continuously in sync with the customers' own growth journeys, engendering pride of ownership and enhanced customer experience

**Customer Service Experience:** Customer service is readily accessible and stress-free, and delivered with high quality, high availability, and fast response time

**Brand Equity:** Customers perceive the brand positively and exhibit high brand loyalty, which is regularly measured and confirmed through a high Net Promoter Score®

## Best Practices Recognition Analytics Methodology

### Inspire the World to Support True Leaders

This long-term process spans 12 months, beginning with the prioritization of the sector. It involves a rigorous approach that includes comprehensive scanning and analytics to identify key best practice trends. A dedicated team of analysts, advisors, coaches, and experts collaborates closely, ensuring thorough review and input. The goal is to maximize the company's long-term value by leveraging unique perspectives to support each Best Practice Recognition and identify meaningful transformation and impact.

VALUE IMPACT			
STEP		WHAT	WHY
1	<b>Opportunity Universe</b>	Identify Sectors with the Greatest Impact on the Global Economy	Value to Economic Development
2	<b>Transformational Model</b>	Analyze Strategic Imperatives That Drive Transformation	Understand and Create a Winning Strategy
3	<b>Ecosystem</b>	Map Critical Value Chains	Comprehensive Community that Shapes the Sector
4	<b>Growth Generator</b>	Data Foundation That Provides Decision Support System	Spark Opportunities and Accelerate Decision-making
5	<b>Growth Opportunities</b>	Identify Opportunities Generated by Companies	Drive the Transformation of the Industry
6	<b>Frost Radar</b>	Benchmark Companies on Future Growth Potential	Identify Most Powerful Companies to Action
7	<b>Best Practices</b>	Identify Companies Achieving Best Practices in All Critical Perspectives	Inspire the World
8	<b>Companies to Action</b>	Tell Your Story to the World (BICEP*)	Ecosystem Community Supporting Future Success

\*Board of Directors, Investors, Customers, Employees, Partners

## About Frost & Sullivan

Frost & Sullivan is the Growth Pipeline Company™. We power our clients to a future shaped by growth. Our Growth Pipeline as a Service™ provides the CEO and the CEO's growth team with a continuous and rigorous platform of growth opportunities, ensuring long-term success. To achieve positive outcomes, our team leverages over 60 years of experience, coaching organizations of all types and sizes across 6 continents with our proven best practices. To power your Growth Pipeline future, visit Frost & Sullivan at <http://www.frost.com>.

# The Growth Pipeline Generator™

Frost & Sullivan's proprietary model to systematically create ongoing growth opportunities and strategies for our clients is fuelled by the Innovation Generator™.

[Learn more.](#)

**Key Impacts:**

- **Growth Pipeline:** Continuous Flow of Growth Opportunities
- **Growth Strategies:** Proven Best Practices
- **Innovation Culture:** Optimized Customer Experience
- **ROI & Margin:** Implementation Excellence
- **Transformational Growth:** Industry Leadership



# The Innovation Generator™

Our 6 analytical perspectives are crucial in capturing the broadest range of innovative growth opportunities, most of which occur at the points of these perspectives.

### ***Analytical Perspectives:***

- Megatrend (MT)
- Business Model (BM)
- Technology (TE)
- Industries (IN)
- Customer (CU)
- Geographies (GE)

