SHIFT5

2025 TECHNOLOGY INNOVATION LEADER

Enhancing Customer Impact Through Powerful Technology Integration

RECOGNIZED FOR BEST PRACTICES IN THE NORTH AMERICAN ONBOARD OT PLATFORM INDUSTRY

FROST & SULLIVAN

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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. Shift5 excels in many of the criteria in the North American onboard OT platform space.

RECOGNITION CRITERIA	
Business Impact	*Technology Leverage*
Financial Performance	Commitment to Innovation
Customer Acquisition	Commitment to Creativity
Operational Efficiency	Stage Gate Efficiency
Growth Potential	Commercialization
Human Capital	Application Diversity

The Transformation of the Onboard OT Platform Industry

Redefining Visibility and Protection for Moving Assets



Onboard OT systems encompass the embedded computers, sensors, and digital control networks that manage the critical functions of aircraft, railcars, ships, and military vehicles, from navigation and propulsion to communications and safety mechanisms. For decades, these systems were treated as safe from outside interference. In reality, they depend on complex digital networks and sensors that are increasingly exposed to cyber and electronic warfare threats. Conventional black boxes capture only a fraction of telemetry at multi-second intervals, pushing any safety and cybersecurity investigations to post-event analysis rather than enabling real-time defense. Meanwhile, new risks, such as GPS jamming, spoofing, or unencrypted air-to-ground communications, have escalated in frequency and impact. This gap between operational exposure and security oversight has created an urgent need for solutions built specifically for critical OT assets in motion.

Shift5 has pioneered the category of onboard OT observability, providing full-fidelity data capture directly from a vehicle's serial-bus networks and RF systems, transforming hidden onboard data into actionable operational intelligence. Through its Manifold edge devices, Shift5 performs passive, one-way data

collection to ensure no disruption to live operations, while the Shift5 Platform translates and normalizes every frame of captured data in real time. These analytics, displayed through the platform's operator interface, such as their announced integration with Jeppesen ForeFlight, allow customers to verify that all data has been ingested, processed, and analyzed as it occurs. This real-time capability enables Shift5 to identify vulnerabilities in critical OT systems such as avionics, navigation, or communications solutions and address potential threats in the moment before they escalate into incidents. Unlike general OT security tools that monitor fixed industrial plants and assets, Shift5 focuses on moving fleets to deliver real-time visibility into every frame of onboard data.

Shift5's key innovation - its analytics software - is supported by their hardware solutions, the Manifold devices: compact and ruggedized units designed for mission-critical platforms and assets such as aircraft, railcars, and maritime vessels. Manifold 4 can ingest multiple bus protocols simultaneously, encrypt data at rest, and stream alerts in near real-time to operators and ground crews for them to take action. Unlike legacy tools that provide limited post-mission data, the Manifold hardware powers full observability of onboard networks, creating a foundation for predictive-maintenance insights and immediate detection of cyber intrusions. Complementing this is Shift5's proprietary GPS Integrity Module, which leverages physics-based modeling to flag spoofing or jamming attempts. By identifying navigation anomalies and electronic warfare attacks, this module creates the bridge between operational safety and cyber defense in a way no conventional black box or threat-monitoring tool has achieved.

From Concept to Cockpit: Reliable OT Cyber Deployment

Shift5 has demonstrated that its products can move from concept to operational deployment rapidly without compromising resilience or compliance. Built for the field and tested in some of the harshest operating environments, the company's hardware and software modules are engineered to detect cyber anomalies and integrity failures at the edge. Shift5's disciplined development process ensures new products meet operator requirements quickly while remaining robust and interoperable with existing systems.

> *"Shift5 has demonstrated that its products can move from concept to operational deployment rapidly, without compromising resilience or compliance. Built for the field and tested in some of the harshest operating environments, its hardware and software modules are engineered to detect cyber anomalies and integrity failures at the edge."*
>
> ***- Tobias Folatelli, Research Analyst, Security***

The Shift5 Platform is more than a data aggregator; it is an OT cyber observability engine that allows operators to detect malicious activity, validate compliance, and maintain secure fleet readiness. Its Compliance Module, now also offered through a global partnership with Boeing, automates the analysis of aircraft security log files to support the Federal Aviation Administration (FAA) and the European Union Aviation Safety Agency (EASA) requirements. By automating anomaly detection and reporting for e-enabled aircraft, it reduces the burden on maintenance and security teams while ensuring no cybersecurity event goes unnoticed.

Equally important is how these solutions are commercialized and adopted. In the defense sector, Shift5 has secured contracts to protect a number of critical mission systems, embedding observability that

improves cyber survivability. In commercial aviation and rail, operators have turned to Shift5 to gain visibility into systems once considered impenetrable, closing blind spots where attackers could exploit unmonitored communications or degraded navigation. By focusing its roadmap on cyber-relevant modules, including predictive maintenance rulesets that surface anomalous data patterns before they escalate into failures, Shift5 ensures its innovations reinforce onboard cybersecurity while also delivering operational value.

Unlike competitors that remain siloed in rail, automotive, or industrial domains, Shift5 has achieved cross-domain scale, proving that one common infrastructure can secure multiple types of moving assets. This breadth makes it uniquely capable of setting the benchmark for onboard OT cybersecurity across industries rather than serving as a point solution.

Sustaining Growth Through Mission-Driven Innovation

> *"By combining technological breakthroughs, proven deployments, and a clear roadmap for expansion, Shift5 is shaping the future of onboard OT cybersecurity. No other provider offers the same depth of observability across aviation, rail, maritime, and defense, nor the ability to turn that observability into compliance, resilience, and operational advantage at scale."*
>
> ***-Tobias Folatelli, Research Analyst, Security***

The company's trajectory confirms its role as more than a niche vendor; it is establishing the standard for how onboard OT security is approached. Over the past year, the company has increased its headcount by almost 40% and won a number of new contracts on novel platforms, as well as expanded existing vehicle deployments by more than 100%. The company is also broadening its core capability sets of observability, predictive maintenance, and intrusion detection, by moving to expand the definition of OT cyber with intrusion prevention capabilities. A recent $75.0 million Series C round, bringing Shift5's total funding to $185.0 million, will accelerate the expansion of its platform and cyber modules across new fleets and geographies.

The company's growth is amplified by strategic partnerships that integrate its cyber observability with broader ecosystems. Collaborations with Carahsoft bring the platform to U.S. defense and public sector customers through established contract channels, while partnerships with Booz Allen Hamilton embed Shift5's onboard data access into Booz Allen Hamilton's AI- and ML-driven cybersecurity workflows. These integrations ensure that alerts generated onboard can be operationalized immediately within existing cyber defense architectures closing the loop from vehicle to command center. In addition, Shift5 and Avionica have partnered to combat GPS spoofing and jamming threats to commercial and business aviation, both of which pose serious risks to flight safety and operations. Their solution combines Shift5's real-time data monitoring with Avionica's avionics hardware for commercial and business aviation to enhance cyber resilience without requiring new equipment.

At the heart of this expansion is a mission-driven culture. Shift5's research team, composed of former military cybersecurity officers and OT specialists, continuously discovers new ways to detect cybersecurity and maintenance anomalies impacting embedded systems. Their findings flow back into the platform, strengthening detection and enabling operators to stay ahead of adversaries. This cycle ensures that as

threats grow more sophisticated, the Shift5 platform remains relevant, resilient, and indispensable to operators.

Conclusion

By combining technological breakthroughs, proven deployments, and a clear roadmap for expansion, Shift5 is shaping the future of onboard OT cybersecurity. No other provider offers the same depth of observability across aviation, rail, maritime, and defense, nor the ability to turn that observability into compliance, resilience, and operational advantage at scale. Shift5 has proven that it can innovate quickly, commercialize effectively, and scale globally. Backed by significant growth, strategic partnerships, and a mission-first research culture, the company is setting a new standard for how onboard OT systems are secured. For its strong overall performance, Shift5 is presented with Frost & Sullivan's 2025 Technology Innovation Leadership Recognition in the onboard OT platform industry.

***Manifold image provided courtesy of Shift5**

What You Need to Know about the Technology Innovation Leadership Recognition

Frost & Sullivan's Technology Innovation 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 Technology Innovation 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

Business Impact

Financial Performance: Strong overall business performance is achieved in terms of revenue, revenue growth, operating margin, and other key financial metrics

Customer Acquisition: Customer-facing processes support efficient and consistent new customer acquisition while enhancing customer retention

Operational Efficiency: Company staff performs assigned tasks productively, quickly, and to a high-quality standard

Growth Potential: Growth is fostered by a strong customer focus that strengthens the brand and reinforces customer loyalty

Human Capital: Leveraging innovative technology characterizes the company culture, which enhances employee morale and retention

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

