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Connected Logistics for

Aerospace & Defense

How A&D companies can build the supply chain visibility, compliance infrastructure, and logistics connectivity their mission-critical programs demand — with Oracle and Intellinum.

Prepared by Intellinum

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Executive Summary

Aerospace and defense supply chains are at a new kind of inflection point. The convergence of geopolitical instability, ITAR and EAR compliance requirements, critical mineral dependence, and escalating customer expectations for transparency has forced a fundamental reassessment of how A&D companies design, manage, and optimize their logistics infrastructure.

A 2025 joint study by Kearney and the Aerospace Industries Association (AIA) found that nearly 60 percent of US A&D companies are actively considering or pursuing localization strategies, driven not by cost alone but by the urgent need for supply chain resilience, compliance continuity, and technology sovereignty. Separately, Roland Berger's 2025 Aerospace Supply Chain Report, surveying nearly 130 industry players across the UK, Germany, and France, found that **64 percent of companies are still experiencing supply chain disruption,** with severity concentrated at the Tier-1 and Tier-3+ levels where logistics visibility is weakest. Financial resource constraints have jumped sharply, with 49 percent of suppliers now lacking the financial resources to support the production ramp-up.

In addition to evaluating localization options, there is another opportunity that makes a significant and immediate difference: Connected Logistics. By unifying trade compliance, transportation management, and warehouse and inventory operations on a shared data foundation, A&D companies gain the real-time visibility, automated compliance, and intelligent logistics optimization they need to execute confidently across any supply model, whether they are reshoring domestically, operating a regional hybrid footprint, or managing multi-country allied networks.

This whitepaper examines why connected logistics is the essential foundation for A&D supply chain transformation, and how Intellinum, as an Oracle-specialized systems integrator, helps companies implement **Oracle Transportation Management (OTM), Global Trade Management (GTM),** and **Warehouse Management (WMS)** Cloud Services to close the gap between where they are and where they need to be.

60%

of A&D companies are considering or pursuing supply chain localization strategies

Kearney / AIA 2025

64%

of aerospace companies still experiencing active supply chain disruption

Roland Berger 2025

112 vs. 67

identified constraints versus opportunities in reshoring efforts

Kearney / AIA 2025

The A&D Supply Chain Under Pressure

A&D supply chains have undergone several evolutions over the past three decades. Trade liberalization in the late 1990s enabled manufacturers to access specialized capabilities, lower-cost production, and broader innovation networks across global supply chains. By the early 2000s, globalization was delivering scale economies, faster innovation, and cost competitiveness at every tier.

That model is now under significant strain. The COVID-19 pandemic, escalating geopolitical tensions in Europe and the Indo-Pacific, and the exposure of critical mineral dependencies have revealed structural vulnerabilities that traditional cost-focused global supply chains were not designed to withstand. The industry has pivoted sharply from efficiency-driven models toward a renewed focus on resilience, compliance continuity, and technology sovereignty.

Roland Berger's 2025 survey of nearly 130 aerospace companies paints a picture of an industry that has stabilized but not recovered. While **70 percent of companies now feel better prepared for the production ramp-up than in 2024**, the underlying constraints remain formidable: 65 percent cite personnel shortages as the primary barrier, 49 percent lack the financial resources to fund the ramp-up (up from 41 percent in 2024), and disruption severity, while declining slightly, still averages 3.8 on a 6-point scale. The most severe disruptions are concentrated at Tier-1 and Tier-3+ levels, precisely the tiers where logistics visibility and compliance infrastructure tend to be weakest.

Six Forces Reshaping A&D Logistics

Research from Kearney and the AIA identifies six interconnected factors now shaping supply chain and logistics decisions across the A&D sector. Each has direct implications for how companies must manage transportation, compliance, and supplier relationships.

01

Business Constraints

Rising costs, longer lead times, overseas quality issues, and limited supply chain control are pushing companies to prioritize operational reliability over unit cost. Lead times are lengthening, largely due to geopolitical risk and supply chain disruption. Twenty-four percent of companies cite delivery lead time as the primary factor in their localization decisions.

02

Materials and Sourcing Risk

Critical mineral dependence, particularly on China for rare earth elements, titanium, and specialty alloys, creates upstream fragility. China accounts for more than 70 percent of global rare earth output and 85 percent of refining. Supplier transparency and traceability below Tier 2 remains limited, with most sub-tier suppliers lacking the systems to provide reliable provenance data.

03

Customer Marketplace Pressure

Domestic production mandates, offset requirements, and proximity-to-customer expectations are reshaping sourcing decisions. Many primes are expanding their domestic supply chains and expecting suppliers at every tier to meet the same standards for on-time, compliant, documented delivery.

04

Risk and Resilience

More than half of A&D companies maintain predominantly US-based manufacturing footprints, yet 33 percent of OEMs still operate balanced global footprints. Dual sourcing and dual-site strategies are becoming standard risk management tools. Companies are shifting from firefighting to stabilization: 47 percent of companies now report being in the stabilization stage, up from 38 percent in 2024.

05

Capabilities and Infrastructure

Workforce shortages, equipment dependencies on foreign-made machine tools, and limited domestic refining capacity constrain full localization. More than 75 percent of A&D jobs are concentrated in just 15 states, creating regional talent gaps that complicate reshoring ambitions.

06

Regulatory and Geopolitical Factors

ITAR, EAR, DFARS, CMMC, and FAR requirements create compliance burdens that are particularly acute for smaller suppliers. Export control compliance is one of the most persistent constraints, creating bottlenecks in onboarding new domestic suppliers and driving some sub-tier vendors to exit the defense sector entirely.

"If you have got 99 parts and you are waiting on the 100th, you do not have a product."

President and CEO, Tier 1 and Tier 2 aerospace supplier

(Kearney/AIA)

Why Logistics Visibility is the Critical Gap

Across all six pressure areas, a single operational deficiency sits at the intersection: the inability to see what is happening across the supply chain in real time. Without multi-tier transportation visibility, companies cannot detect disruptions early enough to act. Without automated compliance workflows, every shipment becomes a manual compliance exercise. Without intelligent routing and carrier management, freight costs grow unpredictably and program schedules are put at risk.

The Kearney/AIA research found that delivery lead time is the top logistics-specific driver of localization decisions, cited by 24 percent of respondents. Roland Berger's maturity assessment reinforces this finding: across eight supply chain maturity dimensions, **end-to-end transparency remains one of the two weakest areas** for the industry, alongside ESG. Companies have improved their organizational capabilities and skills since 2024, but the systems and data integration required for real-time visibility across tiers continues to lag.

Lead time is a symptom, not a root cause. The root cause is a lack of connected logistics infrastructure that enables companies to monitor, manage, and optimize the movement of materials across their supply networks in real time.

The Cost of Disconnected Logistics

When logistics systems are fragmented, the consequences compound across every function. Program managers spend hours chasing carrier updates instead of managing program execution. Finance teams reconcile freight invoices manually, missing leakage and errors. Compliance officers reconstruct audit trails after the fact rather than capturing them systematically at point of shipment. Procurement teams negotiate supplier lead times without visibility into what is actually in transit.

For mid-market A&D companies operating with lean teams and tight program margins, these hidden costs are not trivial. They represent real program risk, real compliance exposure, and real competitive disadvantage as the prime contractors they supply continue to raise their supply chain standards.

> ***"We have gone from an environment of just in time to just in case, stockpiling enough so that we can keep going."***
>
> — Supply chain director, OEM (Kearney/AIA). The shift from efficiency to resilience demands a logistics infrastructure that can support both.

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Connected Logistics: The Strategic Foundation

Connected logistics is not a product or a single technology. It is an operational approach in which every node of the supply chain supplier, carrier, customs broker, warehouse, and end customer operates from a shared, real-time data foundation. It is the infrastructure that makes localization strategies work, whether a company is operating a domestic reshoring model, a regional hybrid model, or a multi-country footprint aligned with trusted allied partners.

The Kearney/AIA research describes three primary strategic models shaping A&D supply chains today: the multi-country shoring model, the regional hybrid shoring model, and the domestic reshoring model. Each model demands different logistics capabilities, but all three share the same foundational requirement: real-time visibility and automated compliance across the transportation network.

The Five Pillars of Connected Logistics in A&D

01 Real-Time Multi-Tier Visibility

Knowing the status of inbound and outbound shipments across all tiers, not just Tier 1 suppliers. This directly addresses the traceability gap identified in the Kearney/AIA research, where visibility below Tier 2 is limited and companies depend on relationships rather than data.

02 Automated Compliance Management

Systemized ITAR and EAR screening, denied party list checks, license tracking, documentation generation, and audit trail capture at point of shipment. This eliminates the manual compliance burden that drives smaller suppliers to exit the defense sector.

03 Intelligent Transportation Optimization

Mode selection, carrier tendering, and routing logic that continuously balances cost, speed, and compliance across domestic, allied, and multi-country supply networks, supporting all three localization models simultaneously.

04 Event-Driven Exception Management

Proactive alerts that surface deviations before they become program-level problems, with automated escalation paths. This capability directly addresses the lead time visibility gap that 24 percent of A&D companies identify as their primary logistics challenge.

05 Integrated Program Alignment

Transportation and warehouse data feeding directly into program management, MRP, and finance systems so operations and planning stay synchronized, enabling the make-versus-buy, dual-sourcing, and capacity planning decisions that localization strategies require.

Oracle WMS, OTM and GTM: Purpose-Built for A&D Complexity

Oracle's logistics suite is not a generic shipping platform. **Oracle Transportation Management (OTM)** handles the end-to-end transportation complexity that defines A&D operations: multi-modal routing, carrier management, freight audit and payment, and cross-enterprise supplier collaboration. Oracle **Global Trade Management (GTM)** provides the trade compliance engine automating export and import screening, license management, and regulatory documentation across every jurisdiction a shipment touches. Together with **Oracle Warehouse Management (WMS),** they form the connected logistics foundation that enables A&D companies to operate with confidence across any localization model.

As the Kearney/AIA research notes, companies pursuing domestic reshoring and regional hybrid shoring strategies are investing heavily in digital and automation capabilities to support localization. Roland Berger's survey confirms this trajectory: **65 percent of aerospace companies already use or plan to use innovative software tools such as AI,** with inventory and warehouse management ranking as the third most relevant AI use case (cited by 44 percent of respondents). Oracle's logistics platform is the enterprise-grade system that anchors that digital investment, providing the data foundation that makes AI-enabled risk management, supplier collaboration, and compliance automation possible at scale.

CAPABILITY	A&D RELEVANCE
OTM Global Multi-Modal Routing	Optimize across air, ocean, ground, and government freight lanes. Supports multi-country shoring models and friendshoring strategies with allied nations including India, Japan, Mexico, and Australia.
OTM Carrier Management and Tendering	Centralized carrier selection, automated tendering, and performance scorecards. Enables the dual-sourcing and supplier diversification strategies that A&D companies are adopting to reduce single-source risk.
OTM Freight Audit and Payment	Automated carrier invoice matching that eliminates manual reconciliation and reduces freight spend leakage, freeing operations teams from administrative tasks to focus on program execution.
OTM Real-Time Shipment Tracking	GPS and carrier API integration delivering milestone-level visibility across all active shipments, enabling event-driven exception management that proactively surfaces disruptions before they affect program schedules.
OTM Supplier Collaboration Portal	Sub-tier suppliers confirm pickups, update status, and exchange documents without requiring full platform licenses, extending real-time visibility below Tier 2 where traceability gaps are most acute.
OTM Analytics and Reporting	Pre-built dashboards for on-time performance, carrier scorecards, compliance rate, and freight cost trends, providing the data foundation for make-versus-buy decisions, dual-sourcing evaluations, and program reviews.
GTM Export and Import Compliance Screening	Automated ITAR and EAR screening at point of shipment, denied party list checks against all relevant government watch lists, and real-time sanctions monitoring. Directly addresses the compliance bottleneck that causes smaller suppliers to exit the defense sector.
GTM License and Agreement Management	Centralized tracking of export licenses, technical assistance agreements, and manufacturing license agreements, with automated alerts for expiration, renewal, and usage thresholds.
GTM Trade Document Generation	Automated generation of commercial invoices, shipper's export declarations, certificates of origin, and customs filings, with full audit trail capture for regulatory review.
GTM HTS Classification and Duty Management	Harmonized tariff schedule classification, duty and tax calculation, and trade preference program management across all active jurisdictions, supporting the tariff mitigation strategies that reshoring and friendshoring require.
WMS Warehouse and Inventory Operations	Inventory positioning, demand-driven replenishment, MRO parts management, and reverse logistics support. Provides the inventory visibility foundation that enables intelligent transportation optimization and accurate demand planning.

AI and Intelligent Automation in A&D Logistics

The role of artificial intelligence in A&D logistics is no longer theoretical. Roland Berger's 2025 survey found that 65 percent of aerospace companies already use or plan to use AI and other innovative software tools. Among the top use cases identified by respondents, three are directly relevant to connected logistics: automated quality inspection (46 percent), inventory and warehouse management (44 percent), and supply chain risk management (34 percent).

However, the same research reveals that AI adoption remains early-stage across the industry. The use of innovative tools is currently limited to less than 10 percent of business processes in 79 percent of companies. The primary barriers are a lack of expertise (cited by 61 percent), difficulty integrating with existing systems (53 percent), data security and privacy concerns (42 percent), and high investment costs (40 percent).

This gap between aspiration and execution creates a significant opportunity for companies that build the connected data foundation AI requires. AI-enabled logistics capabilities, predictive disruption detection, automated compliance screening, dynamic carrier selection, demand-driven inventory positioning all depend on clean, integrated, real-time data flowing across transportation, trade, and warehouse systems. Without the connected logistics infrastructure, AI initiatives remain isolated pilots rather than scalable operational capabilities.

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How Intellinum Leverages AI to Accelerate Implementation

Intellinum incorporates AI and intelligent automation at two levels: within the Oracle platform capabilities we deploy, and within our own implementation methodology.

Platform-level AI

Oracle's logistics suite includes embedded machine learning for shipment ETA prediction, carrier performance scoring, anomaly detection in freight invoices, and trade compliance risk assessment. These capabilities activate on the connected data foundation that OTM, GTM, and WMS create, delivering value that compounds as transaction history and data quality improve over time.

Implementation accelerators

Intellinum uses AI-assisted tools throughout our delivery methodology — from automated data mapping and configuration validation during the Design stage, to intelligent testing frameworks that reduce UAT cycle times, to AI-powered documentation generation that ensures every deliverable is consistent, complete, and audit-ready. These accelerators compress timelines and reduce implementation risk, which is particularly valuable in an industry where the Kearney/AIA research found that supplier qualification alone can take six to twelve months.

Post-go-live intelligence

After deployment, AI-driven analytics surface optimization opportunities that manual review would miss: carrier consolidation patterns, compliance screening exceptions that indicate process gaps, inventory positioning adjustments based on transit time variability, and freight cost anomalies that signal contract leakage. These insights feed directly into the ROI measurement framework that Intellinum builds into every engagement.

Why Intellinum

Implementing Oracle OTM and GTM successfully requires more than technical configuration. It requires deep understanding of A&D supply chain workflows, Oracle ecosystem expertise, and the ability to translate the kind of operational complexity described in the Kearney/AIA research into a system that people will use. The compliance burdens, supplier onboarding constraints, and multi-tier visibility gaps that define A&D logistics are not generic problems. They require a partner who has built their practice around solving them.

Intellinum is an Oracle-specialized systems integrator with a focused practice in transportation and logistics technology. We are not a generalist firm trying to serve all industries. We have chosen to go deep in Oracle's supply chain and logistics portfolio, and we are building our A&D practice around the specific compliance, visibility, and integration challenges this industry faces across every localization model from domestic reshoring to regional hybrid to multi-country allied networks.

Our Differentiated Approach

Oracle Partner Network Expertise

Certified OTM and GTM implementation specialists with direct access to Oracle product, support, and roadmap resources. We bring the platform knowledge to configure Oracle's logistics suite for the specific compliance and operational requirements of A&D programs.

A&D Domain Investment

We are actively investing in ITAR and EAR compliance workflow templates, government freight lane configurations, DFARS flow-down automation, and the supplier qualification process designs that the Kearney/AIA research identifies as primary onboarding bottlenecks. Our A&D practice is purpose-built to address these challenges.

Right-Sized Implementations

We serve companies from $50M to $50B in revenue. We design implementations that deliver value quickly, without over-engineering for organizations that are rebuilding local capabilities and managing the cost pressures of domestic production transitions.

AI-Accelerated Delivery

Our methodology incorporates AI-assisted configuration, automated testing, and intelligent documentation generation to compress implementation timelines and reduce risk. These accelerators are particularly valuable in A&D environments where every week of delay has program-level consequences.

ROI-Driven Engagement Model

Every Intellinum engagement includes pre-project benchmarking, in-flight measurement checkpoints, and a structured post-go-live ROI analysis. We define success metrics before the project begins and measure against them throughout, ensuring that the business case is validated with real data, not assumptions.

Post-Go-Live Partnership

Managed services and ongoing advisory support ensure the system continues to evolve with your program requirements, your localization strategy, and the regulatory environment as it develops.

Intellinum's engagement model is built for A&D companies navigating the transition from fragmented global logistics to connected, compliant, and resilient supply networks. We act as an extension of your operations team, not just a software vendor.

What a Typical Engagement Looks Like

Every A&D organization is at a different point in their logistics maturity and their localization strategy. Some are consolidating US production and need the compliance automation to support it. Others are operating regional hybrid models across allied nations and need transportation visibility that spans multiple geographies. Others are in initial exploration, trying to understand where their logistics gaps are before committing to a broader supply chain transformation. Intellinum structures engagements to meet companies where they are.

ROI-Driven Methodology

A core principle of Intellinum's approach is that ROI is not an afterthought measured only at project close. It is built into every stage of the engagement. Before work begins, we establish pre-project benchmarks across the metrics that matter most to the organization, freight cost per unit, compliance incident rate, manual processing hours, carrier on-time performance, inventory carrying cost. These benchmarks become the baseline against which every subsequent stage is measured.

At defined checkpoints throughout the engagement, we review progress against these benchmarks with the project team and executive sponsors. After go-live, we conduct a structured post-implementation ROI analysis that quantifies the realized value and identifies the next wave of optimization opportunities. This approach ensures accountability, builds executive confidence, and creates a factual foundation for expanding the connected logistics footprint across additional programs, business units, or geographies.

STAGE	FOCUS	KEY DELIVERABLES	TIMELINE
Stage 1 Discover	Logistics assessment, gap analysis, and ROI benchmarking	Current-state mapping, compliance gap report, multi-tier visibility audit, pre-project benchmark definition, OTM/GTM business case with ROI model	2–4 weeks
Stage 2 Design	Solution architecture, configuration blueprint, and integration planning	Data model, integration map, compliance workflow design, supplier collaboration framework, milestone plan with ROI checkpoints	3–5 weeks
Stage 3 Deploy	OTM/GTM configuration, integration build, and AI-accelerated testing	Configured OTM/GTM instance, ERP integration, compliance automation, carrier onboarding, user training, mid-project ROI checkpoint	8–16 weeks
Stage 4 Optimize	Adoption, continuous improvement, and managed services	KPI dashboards, carrier scorecards, compliance rate reporting, post-go-live ROI analysis, ongoing optimization roadmap	Ongoing

Is This Right for Your Organization?

Connected logistics with Oracle OTM, GTM, and WMS is a strong fit for A&D companies that recognize themselves in any of the following situations, whether they are early in localization exploration or actively executing a domestic reshoring or regional hybrid strategy.

- You manage ITAR and EAR shipments manually, and compliance documentation is inconsistent, burdensome, or reconstructed after the fact rather than captured systematically at point of shipment.
- You lack real-time visibility below Tier 1 into inbound and outbound shipments across your supplier network, leaving you dependent on relationships and manual check-ins rather than data.
- Your lead times are lengthening and unpredictable because you cannot detect disruptions early enough in the supply chain to respond before they affect program schedules.
- Your ERP handles procurement and production, but logistics is managed outside of it, creating reconciliation headaches and preventing the integrated data flow that localization strategies require.
- You are pursuing a dual sourcing or domestic reshoring strategy and need the transportation infrastructure to support parallel supply chains, new supplier onboarding, and compliance across a more complex network.
- You are operating a multi-country or allied nation footprint and need a single platform to manage transportation compliance, carrier relationships, and shipment visibility across multiple geographies.
- You are growing, and your current logistics processes will not scale with the compliance obligations, supplier network complexity, and program demands that growth in A&D brings.

The Kearney/AIA research is clear: reshoring ambitions face significantly more constraints than advantages, with labor availability, domestic sourcing challenges, compliance burdens, and capital requirements all cited as major barriers. Roland Berger's data reinforces this: **while resilience measures are starting to pay off, companies across all tier levels need to continue their efforts.** Connected logistics with Oracle OTM, GTM, and WMS does not eliminate those constraints, but it removes the transportation visibility and compliance automation gaps that make every other constraint harder to manage. Mid-market A&D companies often see the fastest and most dramatic ROI from implementations precisely because they are moving from the highest baseline of manual effort.

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Ready to Build a Connected Logistics Foundation?

Intellinum offers a complimentary Logistics Readiness Assessment for A&D companies actively evaluating their supply chain infrastructure. In a focused 60-minute session with our Oracle practice, we will:

- Review your current-state logistics environment against the industry maturity model
- Identify your highest-priority visibility and compliance gaps
- Establish preliminary ROI benchmarks based on your freight spend, compliance posture, and operational profile
- Outline a practical path to connected logistics that fits your organization's localization model, budget, and program requirements

Contact us: inquiry@intellinum.com

About Intellinum

Intellinum enables Oracle Supply Chain success from strategy to execution. With unmatched expertise in Oracle Logistics, cloud integration, and software development, Intellinum helps enterprises optimize operations, maximize ROI, and harness AI- driven intelligence.

We help companies across manufacturing, government contracting, and aerospace and defense build the operational infrastructure to compete and scale.

The result: faster implementations, seamless adoption, and measurable performance across supply-chain planning, logistics, and real-world execution

Research references in this whitepaper draw from the Kearney and Aerospace Industries Association joint study, "Strategic Localization: Balancing Risk, Value, and Technology Sovereignty in Aerospace and Defense Supply Chains," 2025; and Roland Berger, "Aerospace Supply Chain: Rate Ramp-Up and Resilience Report 2025."