

Towards Autonomous Operations

Next-Generation Operational Excellence for Logistics Planning

Growth in global maritime logistics is [forecast to grow at about 2.4%](#) annually through the end of the decade according to the [UN Conference on Trade and Development \(UNCTAD\)](#). And growth across all global logistics is expected to increase at a CAGR of 7.2% from 2025 – 2030, according to a recent report by [Grand View Research](#). But these growth projections have a counterpoint: The sector faces powerful headwinds in the never-before-experienced geo-political challenges of tariff volatility, embargoes, war, and piracy—resulting in strategic gamesmanship being played out across global supply chains. And that's all on top of more traditional challenges like wavering fuel prices (whether transported or consumed), skills availability, and supply chain sourcing and route uncertainty. These challenges and the expansion of the transport industry, while critical to meeting increasing product demand, only exacerbate the inherent complexities of effectively managing a globally distributed logistics fleet.

This white paper presents a new paradigm for optimizing global logistics planning, management, and execution: Avathon's Autonomy for Logistics Planning, a sophisticated AI-powered solution built on Avathon's industrial agentic platform designed to integrate seamlessly with existing data from enterprise systems, as well as third-party data whether onboard, weather-related or located in ports, terminals, and management centers worldwide. Autonomy for Logistics Planning takes the next step towards autonomous operations beyond basic vessel/vehicle fleet management, providing an intelligent decision support and execution capability set that digitizes and automates complex processes, optimizes shipping/delivery schedules, and provides accurate logistics demand/delivery forecasts. This powerful new capability set enables fleet owner/operators and shippers to manage and capitalize on volatile market conditions, achieve unrivaled operating efficiency for their businesses, better plan for materials and inbound transportation, create more accurate operating plans, significantly reduce costs, and increase revenue in a world increasingly driven by uncertainty.

Politics and Economics Drive Trade and Transport

Tariffs have been at the top of the news; less so are stories about their effects on global trade and logistics. Will rising tariffs result in also-rising prices for goods? How will companies react to redesign their global footprint and supply chains? Will tariff increases reduce demand for goods and hence slow global logistics? Or will we continue to see demand swings as manufacturers and retailers rush to buy before tariffs go into effect, and then pull back when a tariff is introduced? How will all this uncertainty affect the approaching holiday season? It's an increasingly uncertain world for logistics professionals, but shareholder demand for profitability continues unabated despite the uncertainty. To truly capitalize on these uncertainties, asset owner/operators and shippers must move beyond simple asset monitoring and tracking or reactive response to disruptions to embrace a more intelligent, integrated, proactive and dynamic approach to logistics operations.

Evolving trade and logistical forces present two significant challenges:

Accelerating Complexity: A geographically distributed and technologically diverse portfolio of shipping assets (vessels, railcars, trucks, ports, and terminals) generates immense volumes of disparate data. Contextualizing all this data and extracting meaningful, actionable insights from this data are beyond human capabilities alone. Humans and existing enterprise systems simply can't manage at this scale and level of interdependencies.

The Data Silo Problem: Critical operating data is typically isolated in legacy systems and proprietary databases (e.g., electronic fuel monitoring systems (EFMS), automatic identification systems (AIS), and vessel/vehicle performance monitoring (VPM) systems). End-to-end transportation and logistics value chains, therefore, run on fragmented workflows. This puts a drag on operational productivity, prevents a holistic view of the operating plans and drives costs upward. It also stifles continuous improvement and process redesign initiatives, delays performance improvement outcomes, and results in suboptimal fleet utilization and performance: lower performance at a higher cost. This isn't sustainable. It's time for change. It's time for improved performance, utilization and logistics that can adapt to change through operational agility. But a wholesale systems change or ripping and replacing all existing systems are not practical. A pragmatic and effective solution that leverages the advances in data and AI must provide intelligent actionable solutions by integrating seamlessly with the existing systems and data infrastructure that fleet operators have invested in for decades.

A Comprehensive, Integrated Fleet Management Capability Set

Avathon Autonomy for Logistics Planning is built on the agentic Autonomy Platform with the foundation layer of proprietary computational knowledge graphs; the cognitive layer of generative AI; and machine, deep, and reinforcement learning, all of which operate with unified data seamlessly ingested from existing data systems including from third-party data providers. But unlike other solutions, Autonomy for Logistics Planning is designed to make recommendations or automate actions with or without human intervention, leading to a new paradigm in dynamic operational performance optimization for fleet managers and shippers. Avathon Autonomy for Logistics Planning:

Unifies fleet planning, scheduling, routing, management, and external rules and risk factors

Integrates diverse enterprise system data sources for cargo, shipments, assets, weather, risks, constraints, and business rules across logistics operations

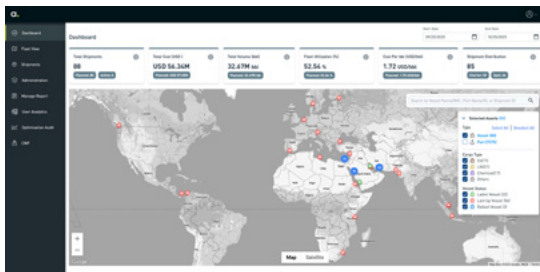
Automates planning and optimization of fleet schedules and asset utilization as the planning system of record

Develops rapid “what if” scenarios to evaluate trade-offs and risk-based resilience strategies. The preferred scenario can be seamlessly reviewed and approved—and even automated—for promotion to plan of record

Incorporates historic performance and real-time conditions to enable proactive diagnostics and prescription to autonomously manage exceptions and disruptions

Drives dynamic optimization with reinforcement learning instead of traditional static operations research techniques

Logistics Planning dynamically evaluates critical factors across capacity, availability, compliance, and scheduling. It also accounts for fuel and maintenance costs, along with external risks such as weather, labor disruptions, and trade volatility.

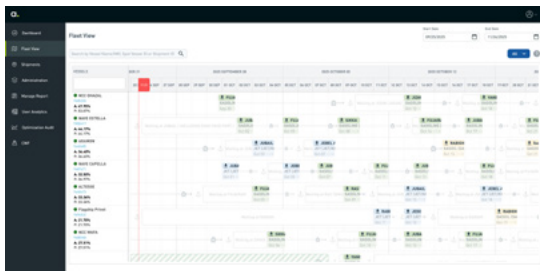


Fleet status is available at a glance with the Autonomy Dashboard

Avathon Autonomy for Logistics Planning includes a comprehensive integrated dashboard that provides a snapshot of the user’s global fleet operation, including total costs, overall fleet utilization, and cost per barrel or container shipped. The dashboard enables viewing of the entire enterprise asset base, including all vessels, vehicles, ports, and terminals, enabling dynamic control to optimize routes and manage assets.

Detailed information displayed includes vessel/vehicle movements, cargo assignments, and operating states (enroute, in-terminal, under maintenance, etc.). The dashboard also displays key performance indicators (KPIs) such as availability and productivity, providing cross-fleet situational awareness. The system’s intuitive user interface enables viewing of specific individual shipment contents, load/unload dates, and product types, as well as shipment costs/volumes and overall fleet utilization, all available at a glance.

The dashboard’s comprehensive reporting capabilities produce actionable insights and enable fully informed decision making. Configurable alerts ensure vessel/vehicle and crew safety and display planned vs. actual performance of individual vessels/vehicles and the overall fleet. The unified dashboard simplifies fleet management, enhancing transport performance, efficiency, and profitability.



Get a Global Fleet View: Dynamic Oversight & Control

Avathon’s Fleet View provides an immediate, intelligent snapshot of your logistics operations, enabling proactive decision-making. It enables you to visualize your fleet plan, gain a clear, timeline-based schedule of vessel/vehicle movements, cargo assignments (e.g., GASOIL, NAPHTHA), and operational states like “Waiting at RAS TANURA.” This visual clarity ensures full situational awareness.

Performance and control are optimized by quickly accessing key vessel/vehicle performance metrics, including availability, utilization and productivity. Our integrated search and filter capabilities allow you to pinpoint specific vessels, vehicles, or shipments, ensuring precise control over your logistics and enabling efficient asset management.

Shipment ID	Name	Type	Product	Location	Status
SHIPMENT-001	Oil Refinery	Oil Refinery	Crude Oil	Refinery	Active
SHIPMENT-002	Oil Refinery	Oil Refinery	Crude Oil	Refinery	Active
SHIPMENT-003	Oil Refinery	Oil Refinery	Crude Oil	Refinery	Active
SHIPMENT-004	Oil Refinery	Oil Refinery	Crude Oil	Refinery	Active
SHIPMENT-005	Oil Refinery	Oil Refinery	Crude Oil	Refinery	Active
SHIPMENT-006	Oil Refinery	Oil Refinery	Crude Oil	Refinery	Active
SHIPMENT-007	Oil Refinery	Oil Refinery	Crude Oil	Refinery	Active
SHIPMENT-008	Oil Refinery	Oil Refinery	Crude Oil	Refinery	Active
SHIPMENT-009	Oil Refinery	Oil Refinery	Crude Oil	Refinery	Active
SHIPMENT-010	Oil Refinery	Oil Refinery	Crude Oil	Refinery	Active

Streamline Your Shipments: Unified Logistics & Optimization

Avathon provides a unified solution to manage and optimize your cargo operations, simplifying logistics and enhancing efficiency. With a unified view and real-time tracking, you gain immediate oversight with a centralized view of every shipment. You can easily track its status (e.g., Completed and Not Started), assigned vessels, load/discharge dates, and product types. Our intuitive interface puts all vital information at your fingertips.

Autonomy gives you intelligent shipment creation and optimization. Beyond tracking, our platform empowers you to create new shipments effortlessly and optimize existing ones with a click. Leveraging Avathon’s advanced AI, it automatically assigns the most efficient cargo allocations, ensuring improved operational value and profitability.

Run ID	Name	Date	Status	Results
OPT-001	Optimization Run	2023-10-25	Completed	100% Success
OPT-002	Optimization Run	2023-10-25	Completed	100% Success
OPT-003	Optimization Run	2023-10-25	Completed	100% Success
OPT-004	Optimization Run	2023-10-25	Completed	100% Success
OPT-005	Optimization Run	2023-10-25	Completed	100% Success
OPT-006	Optimization Run	2023-10-25	Completed	100% Success
OPT-007	Optimization Run	2023-10-25	Completed	100% Success
OPT-008	Optimization Run	2023-10-25	Completed	100% Success
OPT-009	Optimization Run	2023-10-25	Completed	100% Success
OPT-010	Optimization Run	2023-10-25	Completed	100% Success

Drill Down to Audit Details: Detailed Optimization Summary

Avathon provides a powerful, at-a-glance overview of your optimization runs, offering concrete evidence of performance and value. With instant performance metrics you gain immediate insight into Key Performance Indicators (KPIs) from each run including Total Shipments, Total Cost, Total Volume, Fleet Utilization, and Cost Per Barrel.

You also get quantifiable value and operational efficiency. Crucially, you can see the total added value achieved in a run, directly demonstrating the platform’s optimization efficiency, and enabling you to understand how many shipments successfully met all vessel constraints and review shipment distribution (e.g., Charter vs. Spot).

Asset ID	Name	Type	Status	Location
ASSET-001	Oil Tanker	Oil Tanker	Active	Port
ASSET-002	Oil Tanker	Oil Tanker	Active	Port
ASSET-003	Oil Tanker	Oil Tanker	Active	Port
ASSET-004	Oil Tanker	Oil Tanker	Active	Port
ASSET-005	Oil Tanker	Oil Tanker	Active	Port
ASSET-006	Oil Tanker	Oil Tanker	Active	Port
ASSET-007	Oil Tanker	Oil Tanker	Active	Port
ASSET-008	Oil Tanker	Oil Tanker	Active	Port
ASSET-009	Oil Tanker	Oil Tanker	Active	Port
ASSET-010	Oil Tanker	Oil Tanker	Active	Port

Manage The Entire Fleet: Complete Fleet Command

Avathon provides a unified solution to manage and optimize your cargo operations, simplifying logistics and enhancing efficiency. With a real-time fleet overview you can instantly view your Total Fleet and Available Fleet, gaining immediate insight into operational capacity and accessing detailed vessel/vehicle information, including assigned cargo, location, fuel, and cleanliness status.

You can streamline vessel/vehicle management by efficiently tracking key statuses like “Clean,” “Active,” or “Laid Up,” and utilize the integrated search to quickly locate vessels/vehicles and easily add new vessels/vehicles to expand your operational capabilities.

Report ID	Name	Type	Status	Date
REPORT-001	Report	Report	Active	2023-10-25
REPORT-002	Report	Report	Active	2023-10-25
REPORT-003	Report	Report	Active	2023-10-25
REPORT-004	Report	Report	Active	2023-10-25
REPORT-005	Report	Report	Active	2023-10-25
REPORT-006	Report	Report	Active	2023-10-25
REPORT-007	Report	Report	Active	2023-10-25
REPORT-008	Report	Report	Active	2023-10-25
REPORT-009	Report	Report	Active	2023-10-25
REPORT-010	Report	Report	Active	2023-10-25

Timely Reporting: Actionable Insights

Avathon’s Reports module transforms your operational data into powerful, actionable insights, driving informed decision-making and continuous improvement.

You can access standard reports or create specialized ones. For example, the Fleet Report details shipment actions per vessel/vehicle. The Vessel Performance Report provides assignments with loading and discharge statuses, allowing you to stay informed with intelligent alerts. For example, Action State Changed captures planned vs. actual discrepancies, sending immediate notifications. The Count Planned Due Actions report updates on past or due vessel/vehicle activities, ensuring timely follow-up. You can generate and send reports effortlessly.



Monitor User Activity: Optimize Adoption & Engagement

The User Activity dashboard provides deep insights into how your team interacts with the platform, allowing you to monitor usage and drive greater adoption and value. The dashboard enables you to track daily user engagement and gain a clear understanding of daily active users, identifying trends and usage fluctuations over the last 30 days, and assessing platform utilization to ensure maximum impact.

The solution enables you to observe the daily influx of new users and the percentage of active users who are new versus returning. This data is crucial for evaluating onboarding effectiveness and long-term engagement strategies, ensuring continuous platform value.

Audit ID	Name	Date	Start Time	End Time	Automation	Progress	Performance
1	Optimization Audit	2023-10-25	08:00:00	09:00:00	100%	100%	100%
2	Optimization Audit	2023-10-25	09:00:00	10:00:00	100%	100%	100%
3	Optimization Audit	2023-10-25	10:00:00	11:00:00	100%	100%	100%
4	Optimization Audit	2023-10-25	11:00:00	12:00:00	100%	100%	100%
5	Optimization Audit	2023-10-25	12:00:00	13:00:00	100%	100%	100%
6	Optimization Audit	2023-10-25	13:00:00	14:00:00	100%	100%	100%
7	Optimization Audit	2023-10-25	14:00:00	15:00:00	100%	100%	100%
8	Optimization Audit	2023-10-25	15:00:00	16:00:00	100%	100%	100%
9	Optimization Audit	2023-10-25	16:00:00	17:00:00	100%	100%	100%
10	Optimization Audit	2023-10-25	17:00:00	18:00:00	100%	100%	100%
11	Optimization Audit	2023-10-25	18:00:00	19:00:00	100%	100%	100%
12	Optimization Audit	2023-10-25	19:00:00	20:00:00	100%	100%	100%
13	Optimization Audit	2023-10-25	20:00:00	21:00:00	100%	100%	100%
14	Optimization Audit	2023-10-25	21:00:00	22:00:00	100%	100%	100%
15	Optimization Audit	2023-10-25	22:00:00	23:00:00	100%	100%	100%
16	Optimization Audit	2023-10-25	23:00:00	00:00:00	100%	100%	100%
17	Optimization Audit	2023-10-25	00:00:00	01:00:00	100%	100%	100%
18	Optimization Audit	2023-10-25	01:00:00	02:00:00	100%	100%	100%
19	Optimization Audit	2023-10-25	02:00:00	03:00:00	100%	100%	100%
20	Optimization Audit	2023-10-25	03:00:00	04:00:00	100%	100%	100%
21	Optimization Audit	2023-10-25	04:00:00	05:00:00	100%	100%	100%
22	Optimization Audit	2023-10-25	05:00:00	06:00:00	100%	100%	100%
23	Optimization Audit	2023-10-25	06:00:00	07:00:00	100%	100%	100%
24	Optimization Audit	2023-10-25	07:00:00	08:00:00	100%	100%	100%
25	Optimization Audit	2023-10-25	08:00:00	09:00:00	100%	100%	100%
26	Optimization Audit	2023-10-25	09:00:00	10:00:00	100%	100%	100%
27	Optimization Audit	2023-10-25	10:00:00	11:00:00	100%	100%	100%
28	Optimization Audit	2023-10-25	11:00:00	12:00:00	100%	100%	100%
29	Optimization Audit	2023-10-25	12:00:00	13:00:00	100%	100%	100%
30	Optimization Audit	2023-10-25	13:00:00	14:00:00	100%	100%	100%

Perform an Optimization Audit: Comprehensive Performance Review

Users receive a detailed summary of each optimization run, offering critical insights into performance, costs, and the value generated by the solution.

Activity Name	Status	Details
Activity 1	Completed	Activity 1 details
Activity 2	In Progress	Activity 2 details
Activity 3	Pending	Activity 3 details
Activity 4	Failed	Activity 4 details
Activity 5	Completed	Activity 5 details
Activity 6	In Progress	Activity 6 details
Activity 7	Pending	Activity 7 details
Activity 8	Failed	Activity 8 details
Activity 9	Completed	Activity 9 details
Activity 10	In Progress	Activity 10 details
Activity 11	Pending	Activity 11 details
Activity 12	Failed	Activity 12 details
Activity 13	Completed	Activity 13 details
Activity 14	In Progress	Activity 14 details
Activity 15	Pending	Activity 15 details
Activity 16	Failed	Activity 16 details
Activity 17	Completed	Activity 17 details
Activity 18	In Progress	Activity 18 details
Activity 19	Pending	Activity 19 details
Activity 20	Failed	Activity 20 details
Activity 21	Completed	Activity 21 details
Activity 22	In Progress	Activity 22 details
Activity 23	Pending	Activity 23 details
Activity 24	Failed	Activity 24 details
Activity 25	Completed	Activity 25 details
Activity 26	In Progress	Activity 26 details
Activity 27	Pending	Activity 27 details
Activity 28	Failed	Activity 28 details
Activity 29	Completed	Activity 29 details
Activity 30	In Progress	Activity 30 details

Extend Visibility to the Crew: On-deck Operational Control

The Captain's Web Form empowers on-vessel personnel with a direct, real-time interface to manage and report operational activities, ensuring seamless execution and accurate data flow.

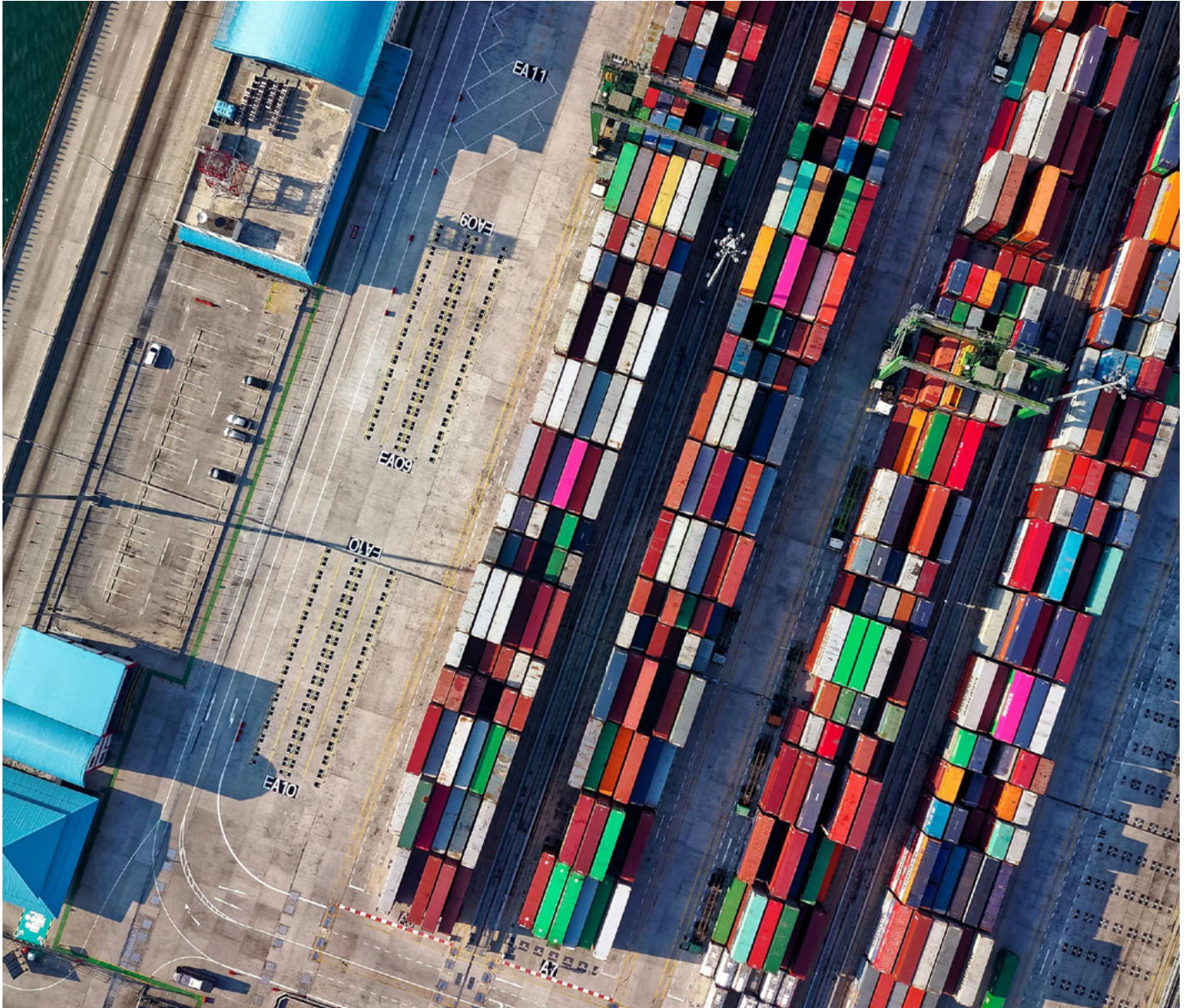
The vessel and shipment overview provides captains and crew with instant access to key shipment details including quantity, estimated cost, and products. The panel tracks overall vessel/vehicle status, indicating "On Time" performance. Captains also receive real-time activity tracking and reporting. The form details each activity like "Waiting" or "Loading," enables comparison of Planned versus Actual start/end times and durations, and allows users to track Actual Cost for precise progress updates and immediate discrepancy identification.

Avathon Autonomy for Logistics Planning: Proven at Scale

Avathon Autonomy for Logistics Planning, developed in collaboration with a global Oil and Gas supermajor, has optimized billions of barrels of petroleum shipments, and thousands of voyages and vessel operations. This same logistics digital twin and enhanced optimization approach now powers Avathon's liquid bulk logistics planning application for all fleets across the globe.

"The global logistics industry is at a critical inflection point, with evolving political and regulatory decisions creating immense operational uncertainty. Our Autonomy for Logistics Planning is the answer. We're not just providing a dashboard; we're providing a fully automated intelligent system that makes real-time decisions, transforming how fleet assets are managed from the ground up. We believe that the future of global logistics is autonomous."

— Pervinder Johar, CEO



The Time for Operational Excellence in Global Logistics Planning is Now

Avathon first introduced its asset performance management (APM) system nearly a decade ago and has, since then, been instrumental in contributing to the growth of the worldwide logistics industry. Continuing advances in this sector now demand a more comprehensive solution, one that includes not only fleet asset management, but also an end-to-end focus on operational process optimization. Autonomy for Logistics Planning is that AI-powered solution, available today to take your global fleet to the next level of operational performance and agility.

The future of fleet management is not just about transporting products; it's about managing and optimizing the entire operational value chain with intelligence and precision. Avathon's Autonomy for Logistics Planning is the critical next step in the evolution of the global trade/transport industry. By providing a solution that can autonomously manage assets, automate logistics planning and processes, we are not only improving the profitability of logistics operators but also building a more resilient, efficient, and sustainable transport infrastructure. The era of autonomous logistics planning and execution is here, and it promises to reshape our world for the better.

About Avathon

Avathon is the leader in Autonomy for Operations. The Avathon Autonomy Platform powers a synthetic workforce of autonomous agents, transforming how businesses plan, orchestrate, and manage operations across manufacturing, supply chain, and asset management.