



# Smart Maritime Infrastructure (PSMI)

*A Strategic Framework for Secure, Intelligent, and Connected Sea Transport Systems*





## Executive Overview

The maritime sector is undergoing rapid digital transformation, with increasing demands for automation, cybersecurity, and real-time coordination across ports, vessels, and coastal infrastructure.

The Smart Maritime Infrastructure (PSMI) initiative proposes the deployment of PeAN (Personal Access Node) devices and systems to enhance port operations, vessel tracking, cargo logistics, and maritime safety.

By integrating PeAN nodes into port terminals, shipping corridors, and intermodal hubs, this project will establish a secure, AI-powered communication and coordination layer for sea transport—supporting both commercial and public sector missions.





## PeAN in the Maritime Industry

PeAN is a secure, AI-powered communication and coordination system that enables real-time perception, digital identity verification, and autonomous decision-making across complex environments. In maritime contexts, it acts as a **smart nervous system** for ports, vessels, and coastal infrastructure.

### Why It Matters for Maritime Operations

- **Port Efficiency:** PeAN nodes can coordinate cranes, yard vehicles, and cargo flows to reduce idle time and increase throughput.
- **Vessel-to-Port Communication:** Enables encrypted, real-time data exchange between ships and terminals for docking, scheduling, and logistics.
- **Autonomous Navigation:** Supports semi- and fully autonomous vessels with AI-assisted routing, obstacle detection, and berthing.
- **Cybersecurity & Credentialing:** Provides digital identity verification for crew, contractors, and cargo handlers—reducing fraud and unauthorized access.
- **Environmental Monitoring:** PeAN can track emissions, water quality, and weather conditions to support sustainability and compliance.

### Strategic Benefits

- Enhances **safety and resilience** in port and sea operations
- Reduces **operational costs** through automation and predictive analytics
- Attracts **investment and innovation** to smart port regions
- Supports **intermodal logistics** by linking maritime, rail, and road networks
- Aligns with **IMO digitalization goals** and national maritime cybersecurity strategies





## Core Objectives

<b>Deploy</b>	<b>Deploy PeAN infrastructure at major ports and coastal logistics zones</b>
<b>Enable</b>	<b>Enable secure vessel-to-port and port-to-port communication using encrypted PeAN mesh networks</b>
<b>Support</b>	<b>Support autonomous and semi-autonomous vessel operations through real-time perception and routing</b>
<b>Enhance</b>	<b>Enhance maritime cybersecurity and digital credentialing for port workers, cargo handlers, and vessel crews</b>
<b>Establish</b>	<b>Establish a replicable model for smart maritime corridors across U.S. and allied ports</b>



## Key Use Cases

**Smart Port Operations:** Real-time coordination of cranes, yard vehicles, and cargo flows

**Autonomous Vessel Docking:** PeAN-assisted navigation and berthing for electric or crewless ships

**Secure Crew Credentialing:** Digital ID verification and access control for port and vessel personnel

**Environmental Monitoring:** PeAN sensors for emissions tracking, water quality, and weather alerts

**Disaster Resilience:** Emergency routing and communication continuity during coastal disruptions





## Implementation Plan

### Phase 1: Site Selection & Stakeholder Alignment (Months 1–6)

- Identify pilot ports (e.g., Port of Savannah, Port of Long Beach)
- Engage U.S. Coast Guard, MARAD, port authorities, and logistics firms

### Phase 2: Infrastructure Deployment (Months 7–16)

- Install PeAN nodes on vessels, cranes, control towers, and intermodal terminals
- Integrate with port management systems and AIS (Automatic Identification Systems)

### Phase 3: Operational Pilots & Data Collection (Months 17–24)

- Conduct live cargo handling, vessel docking, and emergency response scenarios
- Monitor performance, cybersecurity, and workforce interaction

### Phase 4: Evaluation & National Blueprint (Months 25-36)

- Publish the PeAN Maritime Corridor Playbook
- Prepare for replication across U.S. ports and international partners





## **Expected Outcomes**

- Improvement in port throughput efficiency
- Reduction in vessel idle time and emissions
- Enhanced maritime cybersecurity posture
- Credentialed workforce and automation readiness
- Scalable model for smart coastal infrastructure

**We invite you to join us!**