



Maritime Autonomy

The U.S. Department of Defense (DoD), Navy, and Intelligence Community are turning to unmanned maritime autonomous platforms to reduce cost and risk, increase capability and capacity, and enable new missions. Autonomous platforms are also central to executing the Third Offset Strategy—the pursuit of next-generation technologies with the goal of strengthening deterrence—in a budget and resource-constrained environment.

To achieve mission success, these platforms must demonstrate autonomous behaviors and performance, including development, integration, testing, command and control, logistics, and maintenance. In addition, the platforms need the flexibility to integrate new mission payloads cost-effectively and easily undergo performance improvements.

OUR APPROACH

Leidos delivers autonomous and unmanned technologies to help make maritime operations safer and more efficient for government and industry by providing leading sensor systems, signal processing, communications hardware, and software to support vital missions. By applying best practices and technical prowess honed from our work helping global customers meet mission imperatives and our industry-leading research and design, Leidos is helping proven technology to support current and future unmanned needs.

Our maritime autonomous technology relies on our exclusive sensor suite and software expertise that has been tested on-water using a Leidos owned and operated software integration lab (SIL) and workboat. This surrogate vessel is able to support, develop, integrate, and test autonomy capability, behaviors, and performance. In addition, it has successfully sailed a complicated inshore environment, controlled only by the autonomy system, and has demonstrated that Leidos can integrate autonomous technology onto manned platforms. Customers who use our technology are ensured that it is tested and successful.

OUR CAPABILITIES

Leidos maritime autonomy capabilities provide key mission solutions over a longer range and endurance, at lower cost and risk in all operational areas of interest (deep ocean and littoral) than current manned platforms or other existing smaller autonomous platforms. Our maritime autonomy capabilities include basic mission behaviors, obstacle avoidance behaviors, and International Maritime Organization Rules for Preventing Collisions at Sea (COLREGS) behaviors. Additional capabilities that Leidos developed to support autonomous platforms include:

- ▶ Distributed hierarchical autonomy and system architectures that enable modular and distributed functionality, fault tolerance, strong information assurance, anti-tamper, multi-level security capabilities, and proper intellectual property management for government and industry
- ▶ The application of true Open Systems Architecture, including key open software, electrical, and mechanical interface and module definitions, modular, standardized and published interfaces and services, and participation with government and industry in standards organizations
- ▶ Autonomy and sensor algorithm development to include autonomy behavior logic and cost functions, path planner integration, sensor fusion and perception, world model and situational awareness development, health monitoring and resiliency algorithms, and sensor detection, classification, localization, and tracking algorithms for multiple sensor modalities
- ▶ Communication, command, and control capabilities, including autonomous platform remote control, monitoring, and operator displays, and communications over multiple sensor modalities, ad-hoc networking of multiple platforms and sensor systems
- ▶ An overall testing approach that includes multiple software integration labs, including software-in-the-loop and hardware-in-the-loop capabilities, simulation, and simulation capabilities, and defined metrics and performance assessment and evaluation tools.

FEATURES	BENEFITS
Unmanned, with lower cost than most manned vessels with similar characteristics	As an operational asset could be deployed in hazardous and threatening areas without much monetary or personnel risk
Longer range (10,000 nautical miles) and endurance (30 to 90 days without supply) than other small-displacement unmanned surface vessels	Range and endurance capabilities provide a decoy ability, generating electronic signals similar to larger ships and giving the appearance of a large, distributed attack, confusing an enemy or otherwise forcing them to spread their forces thin across a wide area
Electronic warfare systems can blind enemy radars and other sensors, and electronic support measures can geolocate and classify those targets	Makes it difficult for hostile submarines or other pop-up threats to surprise high-value vessels, such as aircraft carriers and amphibious assault ships Helps commanders get a better sense of an opponent's "electronic order of battle"
Provides situational awareness	Gives manned ships additional options to avoid threats or launch strikes from the optimal direction

PROVEN SUCCESS

Leidos' maritime autonomous technology has provided a U.S. military branch with a long-range, long-endurance autonomous maritime vessel that can support a wide variety of missions. It gives the government flexibility in determining its needs at a lower cost than similar manned vehicles.

WHY PARTNER WITH LEIDOS?

Threats are many, oceans are vast, and resources scarce. Leidos harnesses best practices, industry-leading research and design, and technical expertise to build and field-test prototypical vessels — which in a matter of years could produce a literal sea change in maritime understanding and capability. Our state-of-the-art unmanned autonomous vessels provide an affordable, flexible warfighting solution for the future.

FOR MORE INFORMATION

leidos.com/systems | leidos.com/contact