



Modeling, Simulation & Training Services

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The 21st Century presents security and military forces with a wide array of threats.

Meeting these threats means making sure your operators and maintainers get the right training for the mission. They might need live training exercises, virtual reality simulations, or construction of a gaming environment.

Leidos provides these training solutions and others to ensure your operators and maintainers are ready to meet the threat and complete the mission.

Modeling, Simulation & Training for Ever-Evolving Threats

Today's rapidly-evolving threat environment necessitates efficient training courses that enable security and military forces to quickly pivot to changes.

Leidos has led this effort to keep pace for nearly half a century, offering an array of modeling, simulation, and training services that reduce complexity and raise quality to help our customers achieve their missions.

At Leidos, we develop, deliver, and maintain holistic live, virtual, and constructive (LVC) training systems to support force protection. Whether fixed, semi-fixed, or expeditionary, our combat training centers (CTC) feature state-of-the-art information management, improved operational performance, and efficient training regimens.

In particular, the Leidos Synthetic Training Environment (STE) has become arguably the game-changer in the security industry. Less reliant on static physical facilities, and easily accessible to trainees, STE incorporates fully correlated terrain databases that can be used in computer simulations, in virtual reality, and also in real-world training exercises.

Our core competencies include:

- ▶ Leading the system integration that drives standardization and cost-effective solutions
- ▶ Assembling complex, large-scale systems to provide fundamental training capabilities
- ▶ Designing and developing simulations and tactical systems
- ▶ Applying the latest techniques in agile software development and leveraging commercial innovation
- ▶ Manufacturing training aids at production levels ranging from prototype creation to low-rate or high-volume production at multiple locations across the country and around the world



The Challenge: Choosing the Right Type of Training for the Mission

What is the best way to train for your mission? Do you need live training drills? Virtual reality simulations? Construct a complete set for wargaming? Or some combination of all three?

As a general rule, our customers prefer to begin with map-based exercises and simulated wargames, then trainees graduate to the use of virtual simulators, and finally, engage in live training as their capstone event.

However you approach your training needs, Leidos can help with core competencies that encompass everything from live to virtual to constructive and gaming.

Live Training

At Leidos, we like to say: "Give us a piece of desert, and we'll give you a completely outfitted combat training center." We don't just say it — we've proven this to our customers around the globe.

TURNKEY COMBAT TRAINING CENTERS

A completely operational training center supported for a lifetime

We tailor our training services based on customer needs, up to and including our most comprehensive service, the Turnkey Combat Training Center (CTC). With a Turnkey CTC, we'll provide a fully-operational live training capability.

Leidos handles everything from running the fiber for the communications groundwork and building the Test and Training Enabling Architecture (TENA) to supporting PM Instrumentation, Targets & Threat Simulators (PM ITTS). We also manage your After-Action Review (AAR) and analysis to determine what worked, what didn't, and how to improve.

In between, we outfit your equipment — everything from tanks and Armored Personnel Carriers (APCs) to helicopters and artillery — with Multiple Integrated Laser Engagement Systems (MILES) to train for direct fire, geo-pairing solutions for indirect fire, and Fixed and Mobile Exercise Control (EXCON) to keep track of all the action. Leidos Turnkey CTCs offer the ability to track the performance of more than 10,000 participants in a single live training exercise, utilizing both tactical voice recording and field and remote video monitoring technology.

And because the expected lifespan of a Leidos Turnkey CTC can stretch 20 to 30 years, we provide comprehensive maintenance and logistics support along the way, and periodic upgrades to keep your CTC state-of-the-art — for decades if necessary.

Virtual

Before running a full-scale training exercise, virtual training can help familiarize operators and maintainers with their equipment at an affordable cost.

Leidos offers virtual training featuring:

- ▶ Integration of complex systems to reduce equipment sustainment and maintenance costs
- ▶ Cradle-to-grave lifecycle management to keep pace with modernization
- ▶ Complete simulation of systems

Here are representative samples of some of the virtual training systems we have built, or are currently offering to our customers:

COMMON DRIVER TRAINER

One trainer, many vehicles

Leidos's Common Driver Trainer (CDT) is the baseline product for all of our virtual trainers, and a key offering in our virtual training program. Leidos has delivered 69 CDT cabs to the U.S. Army. Incorporating the open-source OneSAF common constructive simulation platform Leidos built for the U.S. Army, and our Synthetic Environment (SE) Core architectural framework (see both below), CDT employs a common set of hardware to teach Army servicemen and women to drive multiple vehicle variants. The CDT product line currently supports training for Strykers, Mine-Resistant, Ambush-Protected vehicles, M1A1 and M1A2 tanks, and other vehicles.

Leidos builds every piece of virtual training equipment on the same framework as the CDT, ensuring continuity when transitioning among trainers, and reducing maintenance, sustainment, and upgrade costs.

The CDT product line supports vehicle-specific, high fidelity, operationally relevant individual and crew combat vehicle driver training. CDT simulators use common hardware and software architectures to traverse the 400 million square miles of simulated terrain covered by our Synthetic Environment Core.

The open architecture utilized by CDT can be expanded to develop simulators for updates to current and future military platforms.

NON-RATED CREW MEMBER MANNED MODULE

Virtual training for helicopter crews

An "Air CDT," our Non-Rated Crew Member Manned Module (NCM3) trains helicopter crews to perform critical gunnery, hoist, and sling-load operations. Each NCM3 simulator comprises two manned modules contained within a mobile 53-foot trailer that can be moved to wherever training is needed. To date, Leidos has delivered 16 systems featuring three separate training environments for U.S. Army helicopter crews to operate UH-60 Black Hawk and CH-47 Chinook helicopters.

As with CDT, NCM3 makes use of the Leidos-developed OneSAF common constructive simulation platform and SE Core architectural framework.



LAKOTA SYNTHETIC FLIGHT TRAINING SYSTEMS

Dedicated flight training for the UH-72

As subcontractor to a small business prime contractor, Leidos is building eight, Level 6 FAA-qualified synthetic flight training systems for the U.S. Army National Guard to use in training UH-72 Lakota helicopter pilots.

RC-12X

Special missions require special pilot training

RC-12x is Leidos' fixed-wing cockpit procedural trainer, designed to train U.S. Army pilots of RC-12X Guardrail SIGINT aircraft (and the similar Hawker Beechcraft King Air 350ER aircraft). Pilots can prepare for more than 600 operationally relevant procedures in a realistic environment. In fact, to enhance this system's realism, Leidos builds the RC-12X trainer using salvaged and refurbished parts from the actual aircraft, duplicating the aircraft's cockpit.

Leidos has delivered two units to our customer to date, and is in the process of expanding and upgrading these units. RC-12X is reconfigurable for training on the Army's MC-12S SIGINT aircraft.

JLTV MTS

A better Humvee deserves better training to drive it

The U.S. Army and Marine Corps are in the process of upgrading their HMMWV (Humvee) fleets with the addition of new Joint Light Tactical Vehicles (JLTV). In cooperation with our prime contractor Oshkosh, Leidos is offering to build a dedicated Maintenance Training System for the new JLTVs — first for the U.S. Army and later for the U.S. Marine Corps.

Featuring a classroom training component and a hands on trainer (HOT), the JLTV MTS will feature commercial, interchangeable products and no proprietary software, helping to keep training costs low. In future years, the JLTV MTS will be upgradable to incorporate training courses in other Army vehicles, such as the Stryker APC.

Constructive and Gaming

Underlying both Leidos live and virtual training product lines is the Constructive and Gaming division, where we create training environments. "Constructive" encompasses everything from creating the 400 million square miles of simulated terrain contained in our SE Core, used in virtual reality training regimens, to building physical "sets" for live training.

Our offerings include conceptual modeling (designing virtual worlds) and composable simulation (making these simulations user-configurable) for the terrain, as well as geospecific "patterns of life" simulators to populate the terrain with realistic inhabitants.

Gaming involves taking this simulated terrain and its inhabitants, and creating and running wargames with them.



A few examples of our work:

SYNTHETIC ENVIRONMENT CORE (SE CORE)

Enabling the full integration and interoperability of Live, Virtual, Constructive and Gaming Training Systems

Leidos built the Synthetic Environment Core (SE Core) Common Virtual Environment program for the U.S. Army. Today, SE Core provides simulations with the ability to fully integrate and operate within live, virtual, constructive, and gaming training domains to ensure trainees get a "fair fight" — simulating, as closely as possible, the real thing.

ONE SEMI-AUTOMATED FORCES (OneSAF)

Powerful constructive simulation tools for an increasingly complex, dangerous world

Likewise, Leidos designed One Semi-Automated Forces (OneSAF), the open-source, common constructive simulation platform used by the U.S. Army, and by joint and non-military communities. Through OneSAF, we can manage the entire simulation life cycle, from scenario development through after action review. OneSAF is a powerful simulation toolkit designed to shorten development cycles, reduce cost, and accelerate the delivery of training to warfighters.

ENTERPRISE DATA SERVICES (EDS)

The ultimate middle man between the data consumer and data provider

One of the biggest risks to any training program is overspending — and one of the easiest ways to overspend is by trying to "reinvent the wheel." At Leidos, we strive wherever possible to integrate commercial, off-the-shelf (COTS) hardware and software into our products, to avoid the high costs of licensing fees and bespoke products. In our Enterprise Data Services (EDS) division, we go one step further to help our customers save money: we use products our customers already own.

After all, if it costs less to buy COTS hardware and software than to buy bespoke, then what if you could buy nothing at all?

How does EDS do this? Throughout government agencies and all around the world, there are terabytes of data that have been assembled to create simulated terrain, locations, and populations, and are already used in training. The data that we used to build OneSAF and SE Core offer two excellent examples of this — data that was created and that can be used repeatedly for years. Leidos EDS works as a "data broker" to find existing data for use in new training products.

At its heart, EDS is a search engine, but an improvement over existing text-only search engines. Whereas older search technology might be able to locate usable data on terrain, locations, and populations using specific text — but fail to identify useful data if the text string is typed incorrectly — EDS improves on this process. EDS utilizes semantic search to capture all possible results that might be relevant — allowing the searcher to decide whether the data is useful or not.

Every bit of data that we can collect with the help of EDS is data that our customer does not have to pay to recreate, and time saved in delivering the product. Thanks to EDS, we can deliver better, lower-cost products to our customers.



Why Choose Leidos?

At Leidos, our talented employees work hard every day to develop, deliver, and maintain holistic live, virtual, and constructive (LVC) training systems that help our customers — in the U.S. and among U.S. allies abroad. As your trusted partner in training, we will work side-by-side with you to improve your operational performance, information management, and efficiency.

We are team players. We work equally well as a prime contractor or among several contractors. Some of our highest profile projects, as detailed above, involve Leidos partnering as a subcontractor to small businesses holding government prime contracts. If you find yourself in possession of such a contract, and feel you need a helping hand with software development or any other tasks necessary to bring it to completion, Leidos is ready.

What else do we bring to the table?

Innovation. Innovation is our bellwether at Leidos, and how we work efficiently to bring your costs down. But that's not all. We're in this for the long haul. With nearly 50 years of experience training the world's security forces and militaries, Leidos knows what works — and how to make it work better. We bring cutting-edge technologies to improve your training results. We deliver what we promise — and we stick with you after delivery to maximize the effectiveness of your system.

Our CTCs are built to last for decades. Along the way, Leidos will be there to supply, maintain, and support your training programs, and to upgrade them as new technologies — like augmented reality — become available. As an expert in systems integration, rest assured: we know how to get the job done.



ABOUT LEIDOS

Leidos is a Fortune 500® science and technology solutions and services leader working to solve the world's toughest challenges in the defense, intelligence, homeland security, civil, and health markets. The company's 32,000 employees support vital missions for government and commercial customers. Headquartered in Reston, Virginia, Leidos reported annual revenues of approximately \$7.04 billion for the fiscal year ended December 30, 2016.



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