



The Innovators: Six Community-Military Partnerships Focused on Military Readiness

If you've never lived or spent any time in a defense community, it may not make sense why the local government, chamber of commerce or civic groups are eager to — or even need to — contribute to the well-being of the local base. “Isn't that the government's job?” is probably a typical response for anyone who hasn't experienced the heartbeat of a military installation up close.

But one explanation as to why communities go to great lengths to support installations in their midst is quite simple and lies in the stories told in the six case studies of community-military partnerships included in this report — namely that many of the issues that define an installation's sustainability originate off base and in some cases, at quite a distance from the base.

Leaders at the three installations that make up Joint Base San Antonio, for example, believed that the lack of a reliable alternate water supply was the primary factor jeopardizing the base's future growth. The fix is coming courtesy of the city of San Antonio, the San Antonio Water System and the state of Texas; each is contributing to a project to connect the water utility to five separate locations throughout the joint base.

On the Florida Panhandle, Eglin Air Force Base (AFB) and the Okaloosa County Water and Sewer Department are helping sustain the region's long-term water supply through a joint effort to irrigate two Air Force golf courses with reclaimed water.

In the case of two projects focused on protecting testing and training ranges — the Navy's Atlantic Test Ranges over the Chesapeake Bay and the Barry M. Goldwater Range in southwestern Arizona — from encroachment, communities surrounding the bases supported by those ranges, in coordination with the U.S. Department of Defense (DoD),

other federal agencies, the states and conservation partners, realized the importance of preserving those far-off lands to the future of local installations.

Sometimes the intervention isn't designed to support a base operationally but, rather, is intended to benefit the quality of life for the personnel and their families stationed there. A public-private partnership spearheaded by the National Math + Science Initiative is supporting teachers and students in military-connected schools to address science, technology, engineering and mathematics (STEM) education needs.

Clearly, there are a lot of different ways to enhance military readiness at a neighboring installation or the lives of the men and women serving our country. And most of the initiatives depend on the contributions of various agencies providing municipal services in the community, with each project depending on a different set of players.

One of the case studies stands apart as it is not designed to improve a specific installation; instead it is promoting military readiness by increasing collaboration within New Jersey's aerospace and defense supply network and helping those firms identify new market opportunities.

But one theme runs through all of the examples. The pursuit of successful projects often requires multiple partners and almost always calls for patience, whether you're attempting to forge new relationships or trying to hash out an agreement for exchanging services. Local agencies typically aren't used to dealing with the bureaucracy required to do business with the military, but that's what it takes to work with an installation — even if you're offering it something for free.

The long-standing effort to preserve the 1.5 million acres of special-use airspace that makes up the Atlantic Test Ranges probably best captures the patience required for successful collaboration. The initiative has required the Navy to work with almost two dozen partners, including the federal departments of Agriculture and Interior, state and local governments, conservation groups and numerous other stakeholders.

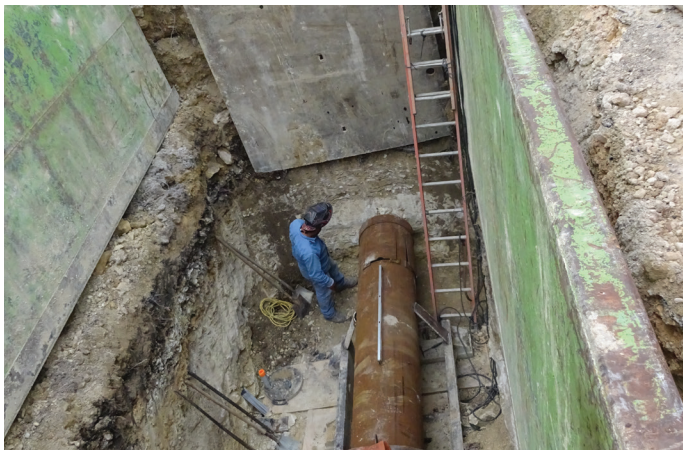
“That requires getting outside the gates,” said Russell Byrd, community planning liaison for Naval Air Station Patuxent River in Maryland. “Finding those partners is key so you can understand their needs and work together to find common ground.”

Local Water Utility Builds Connection to Joint Base San Antonio

San Antonio didn't earn the moniker “Military City, USA” by ignoring requests for the community's support from the commander of Joint Base San Antonio (JBSA).

So in 2014 when Air Force Brig. Gen. Robert LaBrutta, commander of the joint base — which includes Fort Sam Houston, Lackland AFB and Randolph AFB — told local leaders that his highest priority was obtaining alternate backup sources of water to sustain the installations' missions into the future, local and regional agencies stepped up to the plate.

The situation was most critical at Camp Bullis, a training reservation attached to Fort Sam Houston, as its water supply relied on the Trinity Aquifer which was susceptible to drought. The situation was not as urgent at JBSA's three primary installations, which relied on the Edwards Aquifer. Still, those bases frequently were forced to restrict water consumption due to regional drought conditions.



A construction crew is preparing to drill into rock with a tunnel boring machine before placing a water pipeline that will connect to Camp Bullis. (Photo courtesy of the San Antonio Water System.)

Following Gen. LaBrutta's remarks, City Councilman Joe Krier asked the San Antonio Water System (SAWS), the city-owned water utility, to determine how much it would cost to connect to Fort Sam Houston, Lackland and Camp Bullis. Randolph already had a backup water source. The water system estimated the project would cost \$11 million for construction, with an additional \$5 million due to the city in impact fees. The system would become the primary water source for Bullis; and a backup water source for Fort Sam Houston, Lackland, and two individual sites at Lackland, the Medina Annex and Security Hill.

At that point in the middle of 2015 when the city began to consider its options for covering the project's cost, serendipity struck, as Texas lawmakers approved \$30 million in funding for the state's Defense Economic Adjustment Assistance Grant program. Officials immediately saw the state program, an effort to help communities support local installations, as a prime opportunity to obtain a significant portion of the construction costs.

The Alamo Area Council of Governments (AACOG) then stepped in to prepare an application on behalf of the region for a \$5 million grant, the maximum size offered by the Texas Military Preparedness Commission. With many of the state's defense communities expected to pursue funding for projects designed to strengthen local installations, the application process was expected to be highly competitive. In addition, the legislature's \$30 million appropriation for the fiscal 2016-2017 biennium represented the first allocation for the grant program in six years, raising the stakes for submitting a successful application.

Ultimately the commission ranked San Antonio's project the highest among the applicants, and in December 2015 it awarded AACOG a \$5 million grant to connect JBSA to the local water system. By that point, funding for the project had come together — SAWS had agreed to pick up the remaining \$6 million in construction costs and the city had decided to waive \$5 million in impact fees.

As the grant recipient, AACOG took on the role of project manager, although the utility is working directly with the area military installations. The project, which broke ground in March 2016, calls for SAWS to extend water mains and other equipment to the fence lines of the five facilities. The most significant component of the project is the construction of a 1,700-foot-long pipeline to Camp Bullis.

The only notable hurdle that emerged during the project arose at Camp Bullis, the one site requiring a significant amount of construction inside the fence line. After the local project team and JBSA officials decided it would be easier if the Army Corps of Engineers completed the on-base work, the city offered to donate about \$520,000 worth of materials, including pipeline and valves.

Accepting a gift from the local government, though, meant the Air Force — the service responsible for installation support at JBSA — would need to follow a specific set of guidelines before the donation could occur.

“We needed to go through hoops to donate supplies,” said AACOG Executive Director Diane Rath. Obtaining approval from Air Force headquarters ended up delaying construction at Camp Bullis for a number of months.

But with the entire project still on schedule to be completed by August 2017, Rath said she was pleased the effort to provide a reliable water supply for JBSA would help secure the

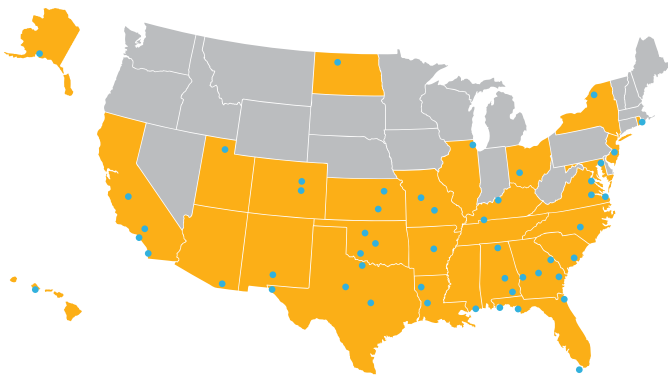
installation's future. "We feel very comfortable this will do a great job of ensuring the continuation of existing missions and positions as well as to attract future missions," she said.

National Math + Science Initiative's College Readiness Program for Military Families at Joint Base Charleston

Over the last decade, the Pentagon's senior leadership has paid increasing attention to the quality of the public school systems serving military families as lower-performing districts have harmed retention rates. In some cases, personnel have refused a new assignment — or at least to live on-post — because they didn't want to send their children to the local schools, or they found it necessary to enroll their kids in private schools.

Starting in 2010, the National Math + Science Initiative (NMSI) extended an existing effort aimed at enhancing teacher effectiveness and student achievement in math and science to schools enrolling military dependents at the request of the Army. NMSI's College Readiness Program for Military Families was launched with the support of Lockheed Martin, but now relies primarily on funding from DoD as well as major defense contractors, including BAE Systems and Northrop Grumman.

The program has two primary missions — improving the quality of military-connected schools by addressing STEM education needs; and supporting the development of the DoD's future STEM workforce. To date, the public-private partnership has been introduced in 160 military-connected schools at more than 75 installations in 29 states.



NMSI's College Readiness Program for Military Families is being offered in 160 military-connected schools across 29 states. (Graphic courtesy of NMSI.)

The military has embraced the initiative not only because it addresses retention and recruitment, but also because of its portability. A student would have no trouble building on the

progress they made in one school system following a transfer to a new school, assuming it was participating in the college readiness program as well, explained Marcus Lingenfelter, NMSI's senior vice president for state and federal programs.

NMSI's program is made up of several elements, including four days of training annually for teachers, extra time on task for students and tutoring. "We're there to build capacity within the building itself," Lingenfelter said. Individual schools implement the program, with NMSI's active management, over the course of three years.

The program measures its impact by the number of students taking and passing Advanced Placement (AP) math, science, and English exams, and offers students financial incentives for achieving qualifying scores on the college-level exams. Teachers also can earn awards based on students' achievement. One of the effort's hallmarks is an emphasis on reaching minority students who historically have been underrepresented in STEM fields.

"We change the culture as to who takes these courses," Lingenfelter said.

The results have been dramatic, with participating schools recording qualifying AP scores at 10 times the national average. "We have watched sleepy school systems turn into math and science factories where they're pumping out three, four or five times the volume of qualifying scores," he said.

Those measurable outcomes are another reason DoD has supported the program.

One installation which had been served by underperforming schools is Joint Base Charleston, S.C., which joined NMSI's college readiness program in 2015. Before the project could be launched there, though, NMSI needed an exemption to the Pentagon's K-12 STEM Education for Military Families funding criteria, which require at least 15 percent of the students at participating schools to be military-connected, or for at least 100 such students to be enrolled at the school. Under those criteria, none of the public schools serving the joint base would have been eligible. But even after receiving the exemption, NMSI needed to ask one of its private sector partners for financial support as DoD only provides partial grants to schools that don't meet the standard criteria.

The Boeing Company stepped in and awarded \$1.5 million to the Joint Base Charleston project. The aerospace giant previously subsidized other project locations and it has a final assembly and delivery plant for the 787 Dreamliner in North Charleston, explained Lingenfelter.

"We literally could not have done this mission in Charleston without their matching grant," he said. Boeing now supports the participation of nine schools serving five installations.

NMSI's program has been underwritten by defense firms at other locations as well in cases in which the participating schools weren't eligible for full funding from DoD. To date, the Defense Department has contributed almost \$75 million to the college readiness initiative.

NMSI works with the military services to select sites to introduce the program. Each service typically will bring its school liaison officers and headquarters officials to meet with the nonprofit to identify communities that would be a good fit, with the performance of local schools playing a key role.

Since starting with one school, Fort Dorchester High School in 2015, the Joint Base Charleston project has added three schools, with a fifth joining this year. The program enjoyed remarkable success in its first year — the number of Fort Dorchester students receiving qualifying scores on AP math and science exams jumped 156 percent.

NMSI expects impressive gains after introducing its teacher and student support program into underperforming schools, Lingenfelter said. "When a school has only a 38 percent increase, we get disappointed."

The initiative has a slate of 40 new schools on deck for 2017-18, but Lingenfelter estimates there still are 400 military-connected high schools in the United States where the program has not yet been offered. "We'll continue the mission as long as DoD wants it," he said.

Okaloosa County, Eglin AFB Partnership to Help Sustain Northwest Florida's Water Resources

In hindsight, at the conclusion of a project with various moving parts, its conception may seem obvious, or even destined. But to the participants who ultimately reached a solution that satisfied everyone's need, nothing could be further from the truth.

In the case of a partnership among the Okaloosa County Water and Sewer Department, Eglin AFB and the city of Niceville — located on the Florida Panhandle — the ball got rolling after the county's Economic Development Council stood up the Tri-County Community Partnership Initiative (TCPI) in 2013 with the aim of helping Eglin and Hurlburt Field identify partnership opportunities with the surrounding community. The initiative was prompted by the new authority included in the fiscal 2013 defense authorization bill allowing military installations and their host communities to enter into intergovernmental support agreements for base support services.

During early discussions among TCPI participants — including the Air Force; local governments in Okaloosa, Walton and Santa Rosa counties; utilities; school districts; business groups and other community organizations — representatives from Eglin told the group the base was looking for a more sustainable approach to irrigating two golf courses located outside of the main base. The installation had been relying

on local aquifers and surface water, but that approach was becoming increasingly challenging.

The southern portion of Okaloosa County had been designated a "water use caution area" by the local water management district as strained aquifers were experiencing saltwater intrusion and a sinking water table. As a result, the water district and state regulators were encouraging utilities and their customers to use reclaimed water for irrigation as a way to sustain the region's water supply over the long term.



The Arbennie Pritchett Water Reclamation Facility, built on Eglin AFB property under an enhanced use lease, serves both the Air Force and Okaloosa County. (Photo courtesy of Okaloosa County Water & Sewer.)

At the same time, the county's water and sewer department was looking for customers in need of a new source of reclaimed water from its largest wastewater treatment plant, the Arbennie Pritchett Water Reclamation Facility. Treating and reusing the effluent it generated, rather than allowing it to infiltrate into the groundwater, would help the area conserve water. The agency had begun discussions with Niceville, which was growing and needed an additional source of reclaimed water; it already had a system for distributing reclaimed water to its customers.

To supply Niceville with reclaimed water, the water and sewer department would need to construct a 10-mile pipeline from the Pritchett facility across Air Force property — testing and training land used by Eglin — to the city. The sewer plant was built on Eglin property under a 30-year enhanced use lease that began in 2007. The plant is for county use, but since it was completed in 2009, Eglin shut down all of its aging treatment plants and began sending its wastewater to the Pritchett facility. The county plant also allowed Eglin to avoid building a new treatment plant for the cantonment area it began to construct in 2009 to accommodate the arrival of the Army's 7th Special Forces Group, a move stemming from the 2005 BRAC round.

The partnership between Eglin and the county water and sewer department that evolved since the Pritchett facility was built

has provided a significant cost savings to the Air Force, and also allowed it to divest itself of a non-core mission.

By 2014, the separate components of a \$9 million project started to fall into place. The water and sewer department would construct a tertiary treatment plant at the Pritchett facility to turn the effluent into reclaimed water, along with the 10-mile pipeline to Niceville. The city would supply the two Air Force golf courses with reclaimed water it received from the county. The county also would construct a 1-mile extension from the pipeline to Eglin's northwest gate, providing the installation the opportunity in the future to use reclaimed water to irrigate recreation fields and other landscaping on the main base.

Eglin would not just be a beneficiary, though. The Air Force agreed to charge the county less than fair market value for the utilities easement needed to construct the pipeline. Eglin's 96th Test Wing, Okaloosa County and Niceville signed a memorandum of understanding outlining the project's elements in October 2014.

The project started to move ahead late last year after the county awarded a contract to design the pipeline. Work on designing the tertiary treatment plant is expected to begin shortly now that the county has selected a consultant. Those two contracts are being funded through a \$3 million appropriation from the state. The water and sewer department will contribute \$3.5 million to the project, including \$1 million of in-kind contributions. The county will ask the state for the remaining \$2.5 million needed to complete the effort.

"[The project's] gone from a pie in the sky in 2014 to we know it will happen," said Mark Wise, deputy director of the water and sewer department. The county hopes the state approves the needed funding this year.

It's not yet clear if the Air Force will pocket significant cost savings by switching to reclaimed water but for Eglin, the project's primary benefit will be helping to sustain Northwest Florida's water supply. "It truly is a great thing for the area — a region-wide supply of reclaimed water," Wise said.

Kay Rasmussen, associate director of the county's economic development council, marveled at the impact the partnership initiative it spearheaded to support Eglin has had in less than four years. "It has grown to be much bigger than we ever dreamed," she said.

NJ MarketShift: Increasing Collaboration within New Jersey's Defense Sector

A groundbreaking program led by the New Jersey Institute of Technology (NJIT) is increasing collaboration among the state's aerospace and defense (A&D) supply network and helping those firms identify new market opportunities in an effort to expand and strengthen a sector that is integral to the military and New Jersey's economy.

To meet its objectives, the initiative, primarily funded through \$7.5 million in grants from DoD's Office of Economic Adjustment (OEA), is relying on a series of professional events for the A&D industry's small and medium-sized companies, a web platform to help firms reach out to new suppliers or potential customers, and support services to foster product innovation and market diversification.

The NJ MarketShift initiative is a response to the cutbacks in defense spending that began in 2013 following the enactment of the Budget Control Act and significantly dented the revenue of small and medium-sized defense contractors in the state. By the time leadership at NJIT learned about OEA's defense industry adjustment program, they already realized there was a pressing need for a project that would help preserve New Jersey's defense-related manufacturing capacity. The OEA program is designed to assist communities addressing contractor and manufacturer downsizing through job-creation strategies such as business development, attraction and expansion; workforce development; and economic diversification.

NJIT's proposal for the MarketShift initiative grew out of several existing programs attempting to provide the region's contractor base with tools to make it easier to identify business opportunities. Staff at NJIT and the New Jersey Innovation Institute (NJII) — an NJIT corporation focused on economic development that is implementing the project — also wanted to support companies' efforts to enter non-defense markets, said Tim Franklin, NJIT's associate vice president for business and economic development.



An open innovation event providing small and medium-sized aerospace and defense firms an opportunity to explore areas of complementary capabilities that could help them meet the requirements of larger firms and compete for new business. (Photo courtesy of the New Jersey Innovation Institute.)

And from a larger perspective, the initiative was viewed as directly benefiting military readiness through its goal of helping sustain New Jersey's A&D supply network during a period of

reduced federal spending and increased competition. OEA initially awarded NJIT an 18-month grant in July 2014; since then the project has been extended, with total funding of \$7.5 million including local matching funds.

One major aim of MarketShift is to enhance collaboration among A&D firms, a goal which was achieved by holding frequent events focused on potential business opportunities for small- and medium-sized A&D companies in an attempt to increase the “network density” within the industry. One set of events were intended to facilitate networking among industry members so they could learn about other companies’ capabilities. Those events were held throughout the state and included the participation of industry members, as well as business groups and economic development organizations. In many cases, the new relationships spurred new business opportunities for the participants, which is the project’s ultimate goal.

To date, about 1,000 firms have participated in MarketShift events and now are part of the project’s “collaboration network,” Franklin said.

Many of the events relied on open innovation, an approach allowing dozens of participants to explore areas of complementary capabilities that could help them meet the needs of larger firms and compete for new business within the A&D market or new markets. For example, one pilot project brought together 90 small and medium-sized New Jersey firms, startups and entrepreneurs using a proprietary facilitation process to address a requirement of Lockheed Martin to develop a condition-based maintenance protocol for a Navy weapons system.

Since that pilot, NJII staff have been trying to apply that model for open innovation to other complex problems as a way to create new opportunities for the state’s A&D firms.

To facilitate ongoing dialogue and interaction among members of the MarketShift collaboration network, NJII is building a web-based portal with information about the firms that make up New Jersey’s A&D supply chain. The MarketShift Intelligence Platform will allow companies that supply services and parts to A&D contractors to connect to one another. Through the use of data analytics, the tool will map the defense supplier network, providing the ability for firms to identify new suppliers, potential customers or sources of technology, explained Michael van Ter Sluis, NJII’s director of innovation services. For example, a company could use the platform, which van Ter Sluis likened to a social network, to look for customers with a similar profile to its existing customers.

The tool also could be used to solicit the supply chain to support a technology requirement from a large company, similar to the pilot project involving Lockheed Martin.

NJIT anticipates OEA will extend the MarketShift project through September and possibly beyond. But already the project team has successfully met its overriding aim of increasing collaboration among small and medium-sized A&D companies in New Jersey as a way to increase business opportunities.

“I think we really had to change the way we approached it to get people’s attention and be able to have an impact,” Franklin said. “The real impact is in having companies increase their revenue or increase their profit. And so we learned a lot about what the context for that to happen is.”

Protecting NAS Patuxent River and the Atlantic Test Ranges

Efforts today to protect the Atlantic Test Ranges (ATR), a special use airspace of 1.5 million acres that straddles the Chesapeake Bay and supports Naval Air Station (NAS) Patuxent River in southern Maryland, rely on support from a multitude of local, state and federal partners whose aims extend beyond maintaining access to the test ranges to conserving agricultural lands and preserving sensitive habitats.

Initially though, the push to limit incompatible development outside NAS Pax River and underneath the test ranges started out on much smaller scale. The base and the Navy office responsible for maintaining the ATR have historically worked to protect the airspace used for supersonic flight training missions, field carrier landing practice, and aircraft research, development, test and evaluation. More than 150,000 testing and research flights are conducted annually within the operating area. The ATR’s proximity to the Baltimore-Washington metropolitan area adds to the Navy’s challenge of reducing encroachment.



Naval Air Station Patuxent River in Maryland, located on the western shore of the Chesapeake Bay, relies on the special use airspace that makes up the Atlantic Test Ranges for aircraft research, development, test and evaluation, as well as flight training. More than 150,000 testing and research flights are conducted annually within the operating area. (Photo courtesy of the Navy.)

After the state of Maryland created the Rural Legacy Program — an effort to protect property vulnerable to development that can weaken an area's natural resources — in 1997, St. Mary's County began to take a closer look at ways to protect the missions of Pax River and ATR. In 2006, the state designated a 13,700-acre rural legacy area south of the base along the Chesapeake Bay, spurring the county to purchase an easement on a small parcel with county funds.

That initial purchase was intended to prove to the state and the Navy that local landowners were committed to preserving their working and natural lands, said Donna Sasscer, agriculture manager for the county Department of Economic Development. As a result, St. Mary's County successfully demonstrated that the goals of protecting the base and test range dovetailed with the aim of helping farmers preserve their land and way of life, prompting the Navy and county to enter into a partnership agreement for encroachment protection. The county now had an additional source of funding to augment its own.

With DoD's Readiness and Environmental Protection Integration (REPI) program getting underway in 2003, St. Mary's soon had a third source of funds to support Pax River and ATR. The REPI program allows the military services to partner with state and local governments and conservation groups to prevent incompatible development and conserve natural landscapes. The Navy first obtained funding through the program to protect the aircraft test and training complex in 2010 through its partnership with the Nature Conservancy.

Since then the REPI program has become critical to local efforts to support the base and test ranges. The county works with Southern Maryland Resource Conservation and Development (SMRCD) Board — which also acts as a local land trust — to identify parcels in the Mattapany Rural Legacy Area that, if developed, could threaten the missions at Pax River. In most cases, the land trust negotiates the purchase of an easement from the property owner, which restricts future development. The Navy's REPI program typically pays 50 percent of the cost of the easement, with the county and state splitting the balance. In a few cases, the land trust — or another conservation partner — will purchase a tract outright. For example, the county has used Maryland's Project Open Space funding to purchase lands for a state and local park.

All of the partners working to protect Pax River and ATR — the Navy, the county, the state and conservation groups — say financial support from the REPI program is critical to reaching their goals. "Without the REPI funds, there is no way this program could be successful; it actually would jeopardize the sustainability of NAS Pax River," said Cindy Greb, the executive director of SMRCD.

Of course, the other funding sources are key, too. State funds, for example, can be applied to incidental planning

costs — including appraisals, boundary surveys and Phase 1 environmental site assessments — which can approach \$40,000 per transaction, Greb said.

Coordinating the acquisition of an easement involving multiple partners, though, creates challenges, as each organization's requirements for property appraisals, environmental surveys and other documentation vary.

"It's a balancing act, understanding the requirements of each agency," Sasscer said. And getting the partners to agree on the language in an easement is another challenge, Greb added.

In the last two years, available funding and the number of partners working to preserve the Navy's mission has expanded with the formation of the Middle Chesapeake Sentinel Landscape, a federal collaboration among DoD, the departments of Agriculture and the Interior, and a diverse set of local stakeholders working to protect lands within a swath of southern and eastern Maryland, along with parts of Delaware and Virginia.

While the partners' individual goals — such as protecting critical areas for wildlife, agricultural production and Navy flight testing — differ, they converge around the objective of limiting incompatible development underneath the flight paths of aircraft in the ATR. Through REPI, more than 2,000 acres of land used for farming, 2,800 acres of forests and 300 acres of wetlands have been preserved in the Middle Chesapeake Sentinel Landscape.

Formation of the Sentinel Landscape has extended the reach of the REPI program, not only by offering new sources of funding but by creating new opportunities. The initiative has brought together stakeholders that otherwise wouldn't have collaborated in an effort to identify the best ways to leverage available funding, explained Russell Byrd, community planning liaison for Pax River.

"It fosters a holistic approach to land conservation," Byrd said.

Sonoran Institute: Developing a Planning Framework for Protecting Arizona's Military Assets

It may not be the first instinct for a nonprofit dedicated to preserving the natural landscape of the West to develop a framework for protecting Arizona's military installations and training ranges from encroachment pressures, but when the Sonoran Institute realized its effort to protect federal lands west of Phoenix from development intersected with the priorities of officials at Luke AFB and the Barry M. Goldwater Range in the southwestern part of state, it pursued the opportunity.

The Sonoran Institute had been working with a number of conservation groups to permanently protect Bureau of Land Management (BLM) holdings through federal legislation before

they succumbed to urbanization extending from Phoenix. In their attempt to form a broad coalition of stakeholders, the groups learned that much of the land they wanted Congress to designate for conservation overlapped with the flight paths used by pilots traveling from Luke to the Goldwater Range, said Ian Dowdy, director of the Sonoran Institute's Sun Corridor Legacy Program.

The folks at Luke connected the conservation groups to another stakeholder that would prove to be valuable — the Fighter Country Partnership, the community-based support group for the installation. The Fighter Country Partnership was instrumental in lobbying for the legislation that would protect about 1 million acres in west-central Arizona for public use or as open space, provide buffer zones outside of the Goldwater Range and prevent development underneath military flight path. The coalition was successful in getting lawmakers to introduce the measure but it failed to advance in Congress.

Nevertheless, the effort to ensure the BLM acreage would be permanently restricted from development became “a launching pad” for a non-traditional approach to protecting the military's mission, Dowdy said. In contrast to the traditional approach of purchasing easements restricting development — or a property outright — to form a protective buffer around an installation or training range, or under flight paths, the Sonoran Institute and its conservation partners saw the value in seeking conservation designations on public lands that border military property.

“[The strategy] is effectively a no-cost conservation easement for the military,” said Mike Quigley, Arizona state director for the Wilderness Society. Preserving public lands, for example, can prevent a neighboring military installation from becoming a haven of last resort for endangered or threatened species once they lose access to similar habitat off base. The tool may not be relevant everywhere, Quigley acknowledged, “but 100,000 acres or more can make a difference.”

The key is finding areas where the benefits of environmental conservation converge with the goal of preserving military testing and training, Dowdy said.

After seeing how its original effort unexpectedly could benefit Luke and Davis-Monthan Air Force bases, and other installations that relied on the Goldwater Range, the Sonoran Institute in late 2014 expanded its work in addressing encroachment into a statewide analysis. The resulting study, *Mutual Benefit: Preserving Arizona's Military Mission and the Value of Publicly Owned Lands*, presented a framework for communities to monitor and assess potential encroachment threats to proactively address or mitigate them.

There's no single threat to Arizona's installations, the study found; the issue is that “encroachments can creep up.” While the relative impact of an individual development may be negligible, Dowdy explained, communities need to be vigilant to ensure the cumulative impact of projects over decades does not make

a base “unviable.” The study also reinforced the need for federal agencies that manage land bordering military bases and training areas to pay more attention to the impacts of their land use decisions on military activities.

To improve the prospect that the state's defense communities would take advantage of the study's planning tools, the Sonoran Institute held workshops in Glendale (Luke AFB), Tucson (Davis-Monthan AFB), Sierra Vista (Fort Huachuca) and Flagstaff (U.S. Naval Observatory) after it released the study in 2015. One of the primary aims of the “road show” was to build awareness among planners in rural communities where the threat of encroachment typically is not an overriding concern, Dowdy said.

As a result of the study, the DoD in 2016 funded a collaboration among the Sonoran Institute, Arizona State University and the city of Surprise — a neighbor of Luke AFB — to create an interactive mapping tool for the siting of energy projects to help planners recognize potential conflicts with DoD early in the development process. The project uses the same framework the Sonoran Institute developed in its original report to identify encroachment concerns.

More recently, the Sonoran Institute launched an assessment of the planning needs for five installations in California.

The benefits for defense communities, conservation groups, DoD and other federal landholders to come together to prevent conflicts with military operations are clear — sustaining national security as well as preserving the estimated \$9 billion annual economic impact the military's presence generates in Arizona.

“There's no reason we need to be fighting over these things. There are many opportunities for a win-win,” said Quigley.

Dan Cohen is managing editor for the Association of Defense Communities' extensive roster of print and online publications. He has 20 years of reporting, writing, layout and copyediting experience with national periodicals dealing with complex topics such as defense, community development and public-private partnerships.