

# General Motors (GM) Partners With Army's Yuma Proving Ground (YPG)

Mark Schauer

Army testers at YPG have full access to GM test tracks such as this one pictured, which can accommodate vehicles with axle loads as heavy as 18,000 pounds, a hefty enough capacity to accommodate nearly 80 percent of all wheeled military vehicles. (U.S. Army photo by Mark Schauer.)



**A**t first glance, the Army and GM have little in common. However, both entities need to test vehicles for reliability in all kinds of conditions: GM to provide high-quality automobiles to consumers and the Army to ensure that America's Soldiers have the most reliable equipment possible on any potential battlefield.

The need of both parties for a specialized hot weather automotive test facility recently led to a groundbreaking partnership between the Army and the Nation's largest auto company, GM, to share a state-of-the-art test complex constructed on the vast expanse of the second largest Army installation in the Nation—YPG, in Southwest Arizona. The 2,400-acre complex was dedicated amidst great fanfare in July 2009.

“In the early stages, it wasn't clear that things would come out this well,” said Ken Morris, GM's Executive Director for Vehicle Integration and Proving Grounds. “It took a great deal of work from both GM's team and the Army's to make it happen.”

### Desert Testers

Unlike the typical Army installation, YPG's mission is not primarily the training of troops, but the test and evaluation of armaments and equipment. Of the approximately 2,500 individuals employed at YPG, less than 200 are uniformed personnel.

The genesis for the partnership between the Army and GM was in the 1990s. During the first Persian Gulf War,

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Army officials were troubled by a spike in tire blowouts in combat areas overseas caused by high temperatures and continuous driving at high speeds. Although YPG was the Army's premier hot weather test site, it lacked a sufficiently specialized facility to conduct continuous high-speed testing on paved roads. DOD recognized the need for such a facility, but the high cost of constructing one was prohibitive at a time when the end of the Cold War and efforts to balance the federal budget combined to squeeze military budgets. In response to these hard facts, a legal device called enhanced use lease (EUL) was developed to allow the military to lease government property to private sector entities whose business may be relevant to military needs.

Meanwhile, GM was seeking to relocate from its 50-year-old hot weather test track in Mesa, AZ, that was both antiquated and situated on prime land in one of the Nation's hottest real estate

markets. GM officials responded to a solicitation letter sent to them and other auto companies by Army officials seeking an EUL partner for desert testing. GM was one of eight automotive industry companies given tours of the potential site and expressed the most interest of any contender.

There were several other tantalizing benefits to locating at YPG. At their previous location in Mesa, photographers in the employ of GM's competitors or automotive industry publications could surreptitiously take pictures of new cars under test from recently constructed houses adjacent to the once-isolated facility. On the ranges of YPG, urban encroachment is not a threat. Additionally, the busy airspace over the proving ground is restricted to military aircraft. “Building at YPG meant we never again would have to worry about spy photographers crawling over the fence,” said Morris.



On the other side of this overpass is the ride and handling track, which has intentional defects ranging from mildly annoying tar strips and short waves to multiple waddles and deep troughs that bounce the stomach into the throat. The overpass is one of two circular tracks that simulate freeway driving. (U.S. Army photo by Mark Schauer.)



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The partnership was finalized in May 2007, by which time word of GM's potential relocation to YPG had been exciting Yuma business leaders for months, and for good reason. The proposed \$100 million facility would provide welcome economic growth to the burgeoning county where YPG is already the largest single employer of civilians. GM's well-known financial struggles the next year filled these same people with worry, but the project was spared. "There was severe pressure to cut costs," recalled Frank West, GM's Desert Proving Ground Manager. "Sometimes that can fracture a team, but we buckled down and worked together to make a lot of tough choices."

They also faced challenges that were atypical for a corporate construction project. YPG's distant history as a training facility for mechanized troops during World War II meant the possibility of hazards from old land mines or other live shells. A thorough sweep for unexploded ordnance had to be conducted prior to groundbreaking, as did additional environmental assessments.

This task was completed in February 2008 as architects put the finishing touches on the track's design. GM's headquarters approved the design and directed construction to begin in May of that year.

### The Tracks

Despite its recent struggles, a visit to the new test track demonstrates that GM knows cars well. The entire facility, from the rows of cubicles in the administration building to the track itself, radiates a palpable aura of cool, minimalist corporate precision. The 14,000-square-foot shop floor is brilliantly illuminated and spotlessly clean and accommodates rows of brand new GM models, some outfitted with camouflage over their trim. Each of the 40 vehicle bays is outfitted with computerized equipment and sensors. Exhaust from running vehicles is vented out

through long plastic tubes that disappear into receptacles in the floor. The facility is significantly more compact than its predecessor in Mesa, yet boasts a wealth of capability the Army needs.

"This complex is efficient and state-of-the-art," said West. "It is better suited to what we are doing. In Mesa, we were scattered over a dozen buildings, while here we are in one. Everyone is just a few steps away from the garage."

Outside the garage are bays for weighing, washing, and vacuuming test vehicles. Stacks of seat-shaped weights ready to place in vehicles stand nearby. Across the way are more than a dozen covered fuel pumps with various grades and blends of gasoline and diesel, including alternative fuels. Just before the entrance to the first track is a set of grades with various degrees of steepness

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to test brakes and transmissions. The two parallel straightaway tracks that simulate freeway driving, complete with overpasses and exits, already have skid marks from screeching brakes, as does the 1,000-by-1,000 foot vehicle dynamics pad, a flat, unmarked swath of asphalt in which the depth of the asphalt throughout varies by less than the width of five sheets of paper. Testers evaluate vehicle handling on this pad by negotiating an orange cone slalom and then driving fast through a “J” turn, a sharply banking horseshoe curve that opens onto the wide asphalt. Surrounding all of this is the 3.5-mile-long circular track. The top speed on this track is 150 miles per hour (mph). Vehicles exceeding 100 mph need to secure permission prior to the test.

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Perhaps the most fascinating of the courses is the ride and handling track, in which virtually every less-than-pristine road condition one can think of is re-created. The intentional defects

along this track range from mildly annoying tar strips and short waves to multiple waddles and deep troughs that bounce the stomach into the throat. All of these, and more, are helpfully marked with highway-worthy blue signs identifying their flaws.

Army testers at YPG have full access to these roadways, which can accommodate vehicles with axle loads as heavy as 18,000 pounds, a hefty enough capacity to accommodate nearly 80 percent of all wheeled military vehicles. Additionally, a clause in the EUL agreement grants YPG the right to drive 10,000 miles per year with vehicles having axle loads as heavy as 10 tons, giving testers leeway with vehicles that have been slightly up-armored. The majority of the tracks can support vehicles with a gross vehicle weight of 80,000 pounds, about 20 times heavier than GM’s largest sport utility vehicles. YPG also has the option to use another GM test track in Milford, MI.

All of these other options will be mere “icing on the cake” upon completion of a 4.5-mile-long paved oval and a 4-mile gravel oval track that can accommodate high-speed testing of both wheeled and tracked vehicles in the Army’s inventory, including the wheeled vehicles too heavy to be tested at the GM facility. Also in the planning stages is a paved 2-mile performance straightaway specifically designed for precise vehicle performance measurements. The paved and gravel ovals are expected to be completed by spring 2010, but the proving ground staff is already busy making good use of the existing tracks. “Access to this facility gives us many

new capabilities,” said Zack El-Ansari, YPG’s Combat Automotive Division Director. “We’ve already certified our first six drivers.”

## A New Day

By the time the last of the assembled dignitaries and media representatives drifted out of the complex on its dedication day in July, the desert sun was shining as usual. The new test track was clearly in the prime of its usefulness amid the rapidly rising temperature and unrelenting heat, and the officials whose vision made this complex a reality were already looking ahead to the distant future, fitting for a complex with a 50-year lease with options for renewal. Among them was Graham Stullenbarger, the now-retired YPG Natural Environments Test Office Chief.

“This track is an outstanding capability for the Army because the agreement allows it to be used for testing and training, and, more importantly, for both manned and unmanned vehicles,” said Stullenbarger. “When the Army moves into robotic vehicles, we’ll have an ideal place to test.”

The representatives of GM could appreciate Stullenbarger’s forward-thinking stance. “Each day, our team is going to get to know the YPG team better, and it’ll become very natural to share things and work through things together,” said Morris. “That makes me happy, for it is indicative of the new GM.”

“The cultures of YPG and the new GM facility are very similar,” concurred West. “We are relatively small groups of extremely talented people who love doing what we do. It is a relationship that will last for a long, long time.”

**MARK SCHAUER** is a public affairs writer at YPG. He holds a B.A. in history from Northern Arizona University.