

THE EVOLUTION OF SURVIVABILITY IN THE STRYKER BRIGADE COMBAT TEAM

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In 2003, the 3rd Stryker Brigade Combat Team (SBCT), 2nd Infantry Division at Fort Lewis, Wash., was the first unit transformed into a SBCT and deployed to Operation Iraqi Freedom (OIF). Since then there have been eight SBCT deployments to OIF. The 3/2 SBCT looked much different than the SBCTs in OIF today. The current SBCT has evolved to include multiple survivability kits or systems. These include retrofits to the Stryker family of vehicles (FoVs), the addition of the Mine Resistant Ambush Protected (MRAP) vehicles, and the improved situational awareness Land Warrior system, which has become the cornerstone for future ground warfighter systems.



As the SBCT's main platform, the Stryker vehicle's tactical mobility requires it to sustain hard surface speeds of 40 mph with no degradation to braking when loaded with its mission equipment package (MEP). Since 2003, the list of improvements and retrofits to the Stryker FoVs continues as the enemy adapts and modifies its methods of attack.

Prior to the 3/2 SBCT deployment to Iraq in 2003, rocket-propelled grenade (RPG) attacks highlighted the need for an increased survivability solution. As a result, the Stryker vehicles were equipped with an interim solution of "slat" armor until bolt on add-on armor could be designed and fielded. Slat armor resembles a cage surrounding the vehicle. The original slat armor added additional width to the vehicle, limiting maneuverability. Slat armor has since been redesigned to reduce the kit weight without decreasing the level of protection. Stryker Reactive Armor Tiles (SRAT) were developed for various Stryker platforms while providing the same level of protection as heavier armored vehicles. Currently, PM SBCT is developing a lighter SRAT with additional protection.

Improvised explosive devices (IEDs) and explosively formed penetrators (EFPs) are responsible for many of the more than 2,000 deaths and numerous casualties suffered by U.S. and coalition forces since OIF began. The Drivers Enhancement Kit (DEK), Hull Protection Kit (HPK) and the Blast Protection Kit (BPK) were developed to enhance the Stryker's survivability against explosive devices.

Another concern considered after the deployment of 3/2 SBCT was survivability of exposed personnel. To increase protection for exposed crews, some units on their own built wood platforms over the ramp to hold sand bags to protect the rear hatch, and ammunition cans filled with sand and sand bags were placed around the gunner's hatch. Eventually, these ad hoc items were replaced by the combat and materiel developers with the Common Ballistic Shield (CBS). Later, the Squad Leader Integrated Protection (SLIP) kit was placed inside of the Common Ballistic Shield to improve vision while maintaining the

same current level of protection as CBS. A ballistic driver's windshield was developed to allow drivers to maneuver vehicles with the hatch open.

To increase the survivability of non-Stryker units in the SBCT, the MRAP vehicle has been added as theater-provided equipment (TPE) to the formation. The MRAP allows the commanders use of a vehicle more survivable than the HMMWV (M1114) or MTV 5-ton. Commanders can use this vehicle to transport Soldiers and equipment as a patrol vehicle for units inside the SBCT that do not have Strykers and conduct traditional Infantry missions. TRADOC Centers of Excellence (CoE) along with the Army Capabilities Integration Center (ARCIC) are analyzing data to integrate the eight MRAP models into the brigade formations.

Not only have survivability enhancements been made to the Stryker vehicle itself, but also to the equipment used by the SBCT Soldiers on the ground and in the air to enhance situational awareness. This enhancement increases a Soldier's mobility and lethality, which makes him more survivable. The addition of the Land Warrior system changed the entire dynamics of ground operations for these units.

"It was like having an FBCB2 or a FalconView in your face. It made us much faster and more lethal," said one staff sergeant with the 4th Battalion, 9th Infantry Regiment, 4th SBCT, 2nd Infantry Division. "It made us more confident because we had the ability to see where we were, to track what we were doing, and to have complete control, because we knew where our forces were. We never got lost. We never missed a turn. We never missed a house."

After 4/2's success with Land Warrior in Iraq, another SBCT will deploy with an entire brigade set of the Land Warrior systems to Afghanistan. These sets will consist of a newer, lighter version of the Land Warrior system, one that weighs 7.2 pounds less than the approximately 17-pound system used in Iraq by 4/2 SBCT. This will be the first Stryker brigade to deploy to Afghanistan.

In conclusion, as a result of lessons learned from the SBCT deployments, the TRADOC Capabilities Manager SBCT (TCM SBCT) and the U.S. Army continue to aid in the tactical mobility, lethality and survivability evolution of not only the Stryker FoVs but the Stryker Brigade Combat Team Soldier. Soldier feedback is the backbone behind TCM's continuous development of new and improved survivability equipment for the SBCTs. To access information for Soldiers and Leaders, the Stryker Warfighter Forum (SWfF) portal was developed to encourage Soldiers to provide feedback at <https://strykernet.army.mil>.

(MSG Brad Kelley and MAJ Michael Davenport are assigned to TCM-SBCT.)

ARMY MOVES FORWARD WITH PLATE CARRIER VEST

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The Army is poised to introduce a plate carrier vest to provide Soldiers more lightweight gear in the challenging operational environments of Afghanistan.

An \$18.6 million contract for 57,000 plate carriers was awarded on 8 October to KDH Defense Systems. The fielding schedule calls for the first plate carriers to be delivered to the Army in December after testing and be fielded to Soldiers soon thereafter, and for deliveries to be complete in March 2010.

Program Executive Office (PEO) Soldier has worked closely with the U.S. Army Infantry School, the Army Test and Evaluation Command, North Carolina State University, the Army Research Laboratory's Survivability/Lethality Analysis Directorate, and the Rapid Equipping Force to assess the performance of commercial-off-the-shelf plate carriers. The objective of these assessments was to gain a thorough understanding of plate carrier performance, both from the perspective of Soldiers who have put a number of plate carriers through rigorous exercises and through the perspective of scientists and engineers who have examined ballistic, burn, and survivability data.

The primary objective in providing Soldiers with a plate carrier is to reduce the weight of their body armor and to significantly reduce heat stress, enhancing Soldiers' combat performance in extreme temperatures. The vest will carry standard hard armor plates for vital ballistic protection, but cover less of the Soldier's body than the Interceptor Body Armor system. The Army chose this solution concept because the technology does not yet exist to make the hard and soft armor components more lightweight.



SGT Teddy Wade

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"We have listened to Soldiers, and we understand that in certain operational environments such as the mountains of Afghanistan, mobility is key to Soldiers' effectiveness against the enemy," said BG Peter Fuller, Program Executive Officer Soldier. "It's a lot to ask for Soldiers to conduct missions in hilly, rocky terrain at high altitudes, wearing the full complement of body armor," he said. "The plate carrier will give the commanders of those units a more lightweight alternative for their Soldiers."

The full-up plate carrier (including front and side hard armor plates) represents a weight reduction of 10 to 15 pounds compared with the full-up Improved Outer Tactical Vest (IOTV) with front and side hard armor plates.

The plate carrier initiative goes back to December 2008, when the 3rd Brigade, 1st Infantry Division requested 1,500 plate carriers. In January 2009, the Army asked industry to present possible designs for a plate carrier. Of 16 interested vendors, four were chosen to participate in Soldier Protection Demonstration (SPD) VII, an 11-day field test in May at the Army's Yuma Proving Ground in Arizona.

Three-dozen Soldiers from the 82nd Airborne Division at Fort Bragg, N.C., and the 173rd Airborne Brigade in Vicenza, Italy, took part in SPD VII, putting eight plate carrier vests through a variety of exercises: the four commercial vests; the U.S. Marine Corp's Scalable Plate Carrier; the Modular

Body Armor Vest used by Army Special Forces; and an IOTV with no attachments as a baseline for comparison.

The Soldiers provided exhaustive feedback — more than 10,000 pages of comments — on the form, fit, and function of each vest they tested, in roadmarches, obstacle courses, weapons familiarization, ingress/egress drills, and room-clearing exercises. They also tested each plate carrier's compatibility with Land Warrior, a Soldier-worn computer system that increases mission speed and effectiveness and decreases risks to the unit by providing state-of-the-art situational awareness. The results of SPD VII helped the Army define its requirement for the plate carrier vest, while vendors' proposals formed the basis for the Army's contract award.

Following the SPD, the Army conducted ballistic and flame testing on the plate carrier candidates to ensure that they could provide Soldiers with vital protection in theater. Those results, combined with the results of SPD VII, contributed to the Army's course of action on the plate carrier.

As the Army develops a longer-term solution, the plate carrier to be procured by PEO Soldier will have certain design features that Army combat developers consider critical. These include, among other features, a drag strap, ease of donning and doffing, and compatibility with Soldiers' weapons and other equipment.

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