Assured Access Through Tactical Mobility:

Observations and Lessons Learned from a Proof of Principle

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"In order to credibly deter potential adversaries and to prevent them from achieving their objectives, the United States must maintain its ability to project power in areas in which our access and freedom to operate are challenged."
— Sustaining U.S. Global Leadership: Priorities for 21st Century Defense[1]

With instability around the world, the decreasing number of prepositioned forces, and the increasing number of adversaries with anti-access and aerial denial (A2/AD) capabilities, the need for a tailorable, scalable, and more mobile Initial Entry Force (IEF) has emerged. The Joint Staff Global Response Force Execution Order (GRF EXORD) delineates that homeland-based mission-aligned forces are assigned the mission of conducting a Joint Forcible Entry (JFE) as an IEF.[2]

The Light Tactical All-Terrain Vehicle (LTATV) proof of principle conducted by 1st Battalion, 325th Airborne Infantry Regiment (AIR) from November 2014 through December 2015 was initiated with Operational Needs Statement (ONS) 14-19635. B Company, 1-325 AIR, an infantry rifle company trained with 33 Polaris Defense MRZR4s for 14 months. In August 2015 we expanded our trials to include training and tactical employment of the Polaris Defense DAGOR, General Dynamics (GD) Flyer 60, and GD Flyer 72 for three weeks. In this article we will discuss the background, highlights, lessons learned from the tactical employment of these vehicles, list the desirable parameters, and make recommendations for furthering this capability within the GRF.

Paratroopers assigned to the 1st Battalion, 325th Airborne Infantry Regiment, 2nd Brigade Combat Team, 82nd Airborne Division, conduct training with the Light Tactical All Terrain Vehicle on Fort Pickett, VA, on 26 February 2015. (Photo by SSG Jason Hull)

During Operation Dragon Spear, paratroopers from the 1st Battalion, 325th Airborne Infantry Regiment conduct a raid after completing a 40-kilometer movement on LTATVs at Fort Irwin, CA. (Photo courtesy of the National Training Center Public Affairs Office)

The Need for Enhanced Tactical Mobility

The Joint Chiefs of Staff's *Joint Concept for Entry Operations* (JCEO) states that "[e]ntry forces will envelop, infiltrate, and penetrate in and/or across multiple domains at select points of entry to place the enemy at an operational disadvantage."[3] "Required Capability 12" identifies a need for an IEF that is specially organized and equipped to handle the unique mission of conducting entry operations with a complement of low signature combat vehicles. These vehicles must be able to be moved by strategic lift and rotary wing assets and land off-set from enemy force concentrations.[4]

ONS 14-19635 requested "an air-droppable enhanced tactical mobility set [of vehicles] because of new operational requirements."[5] Specifically, these requirements were for the GRF Infantry Brigade Combat Team (IBCT) (Airborne) to counter increased proliferation of the enemy's A2/AD capabilities by conducting an airborne assault at an off-set drop zone (DZ) and maneuvering over distance to quickly seize a lodgment as directed in the JCEO.[6] Additionally, increased tactical mobility enhances the 82nd Airborne Division's critical mission of rapidly expanding lodgments through an expanded security zone and affords the division the option of increased ground mobility to leverage speed to bypass known enemy defenses to seize key terrain or defeat enemy forces beyond the traditional airhead line. The 82nd Airborne Division's unique requirements and the gap in meeting policy directives presents a critical and time-sensitive requirement that should not be delayed while the Army considers a broader program of record.

The Army Ground Mobility Vehicle Program

The Maneuver Center of Excellence (MCoE), the Army Tank Automotive Research Development and Engineering Center (TARDEC), Army Test and Evaluation Command (ATEC), and the 82nd Airborne Division recognized the enhanced benefit of mobility platforms to all IBCTs and subsequently conducted a platform performance demonstration (PPD) in June 2014 at Fort Bragg, NC, that sought to validate threshold requirements for industry participants as the Program Executive Office for Combat Support and Combat Service Support (PEO CS & CSS) began to consider a broader program of record for LTATVs beyond the 82nd ONS.[7-8]

Training Overview

After receiving 33 MRZR4s in October of 2014, we conducted extensive training, qualitative and quantitative assessments, and established standard operating procedures for the tactical employment of the vehicles. We

logged more than 21,000 miles on the MRZR4s in the wooded terrain of Fort Bragg, snow and icy swamps of Fort Pickett, VA, high mountain desert and rocky terrain of Fort Irwin, CA, and the loose, open terrain of White Sands Missile Range, NM.

Over 14 months we completed training ranging from individual driver's proficiency to company-level cross-country movements at night. We executed both platoon and company combined arms maneuver live-fire exercises using the vehicles to infiltrate to an objective rally point (ORP). We validated the use of the vehicles during our multi-echelon training events by conducting the three missions specified in the ONS which were derived from combined joint requirements for the mobile enhanced IEF. The three specified missions were: seize an offset DZ and immediately maneuver to seize a lodgment, seize key terrain, and complete assigned missions at extended ranges.[9]

According to a recent Rand Corporation study titled "Assessing Conventional Army Demands and Requirements for Ultra-Light Tactical Mobility," the use of Ultralight Tactical Mobility (UTM) capabilities can be used in the execution of eight basic tactical activities: maneuver force security/reconnaissance, local patrolling and engagements, coordinated maneuver, immediate pursuit, troop mobility, traveling support, casualty evacuation, and internal/ferry support.[10] We incorporated the identified tasks of traveling support and casualty evacuation into our collective training events and tactically employed the MRZR4s and other variants to assess their use as platforms for non-standard casualty evacuation, to emplace weapons squads in support-by-fire (SBF) positions, and to move our organic mortar team to forward mortar firing points (MFPs).

Lessons Learned While Validating the Use of LTATVs to Execute the Three Specified Missions

In order to avoid heavy concentrations of enemy air defenses around a primary airfield, a mobility-enhanced IEF would conduct an airborne assault at an offset, lightly guarded location. The mobile force would then infiltrate the primary DZ and clear the A2/AD threat to enable the introduction of follow-on forces. We validated this specified mission during both Combined Joint Operational Access Exercise (CJOAX) 15-01 in April 2014 and a battalion-level JFE exercise in May 2014.

B Company's initial mission during CJOAX 15-01 was conducting a JFE with the 2nd Brigade Combat Team (BCT), 82nd Airborne Division and the 3rd Battalion of the British Parachute Regiment and then moving to and securing an offset DZ. B Company conducted a parachute assault onto Holland DZ with the rest of 2nd Brigade Combat Team. After rapid assembly, 90 paratroopers on 24 MRZR4 LTATVs moved on unimproved roads at night under blackout conditions aided by the use of night vision devices. We moved at an average speed of 21 kilometers per hour (KPH) along the 30-kilometer route and secured the northern portion of Sicily DZ. Once all of our blocking positions were established and the conditions were set, a secondary airborne assault brought D Company, 2-325th AIR with eight HMMWVs and 24 paratroopers.

During the battalion-level airfield seizure in May 2014, B Company conducted a JFE onto Normandy DZ and moved cross country, without using improved roads or trails, on LTATVs to clear an A2/AD threat near Holland DZ. This set the conditions for the remainder of the IEF airdrop. We drove the 13-kilometer route at night, during a rainstorm, under blackout conditions, in semi-restrictive woodland terrain. The average movement speed for the company was 5 KPH (compared to the 1-2 KPH a rifle company moves at night through the same terrain). Another benefit from using the LTATVs was reduced clearance times for actions on the objective because the paratroopers were not fatigued from the movement to the objective.

For both movements, the company moved on one axis of advance instead of dispersing into faster-moving platoon elements due to the limited range of our organic communications equipment. We were further constrained by not having communications with follow-on forces until our higher headquarters was on the ground, which meant we were unable to synchronize our efforts with the larger joint force. We couldn't let those coming to the fight know that the conditions were set or that potential threats still existed. Distributed mission command equipment that works while moving such as tactical satellite (TACSAT) and the Joint Capabilities Release (JCR) is needed to leverage the range and speed of movement LTATVs provide.

The mission to rapidly expand the lodgment and seize key terrain was validated during Network Integration Exercise 16.1 (NIE) at White Sands Missile Range in October 2015. After conducting a parachute assault onto Space Harbor DZ and assembling on the heavy equipment point of impact (HEPI), a platoon from B Company mounted eight MRZR4 LTATVs and moved approximately 5 kilometers to clear a set of rolling hills in order to expand the lodgment

Paratroopers assigned to the 1st Battalion, 325th Airborne Infantry Regiment assault an enemy-held urban environment at the National Training Center at Fort Irwin on 11 August 2015. (Photo by SSG Jason Hull)

and prevent the enemy from emplacing observed indirect fires onto it. After the introduction of follow-on forces via airlands, the platoon pushed further north to fill a hole in airhead security, and then when called upon, moved further north to support a company attack.

The platoon moved approximately 20 kilometers and conducted multiple missions during the initial six hours of the JFE. The average speed moving through the open desert terrain during daylight was 40 KPH. The ability to move rapidly and be dynamically re-tasked to rapidly expand the lodgment and clear known, likely, and suspected enemy locations to expedite the arrival of follow-on forces makes an LTATV-equipped IEF an asset to the commander during a JFE.

The third mission of completing assigned missions at extended ranges was validated during Operation Dragon Spear, a Chief of Staff of the Army-directed JFE exercise, that was conducted at the National Training Center at Fort Irwin on 6 August 2015. During this exercise, B Company headquarters and one platoon conducted a parachute assault onto Grant DZ with the brigade to set the conditions for airlands. Four hours after the parachute assault, two enhanced mobility platoons arrived via airland on two C-130Js. The aircraft delivered six MRZR4s, two DAGORs, two FLYER 60s, and two FLYER 72s to the airhead. Shortly after arriving, both platoons met at the company assembly area and immediately conducted a 40-kilometer movement to extract a downed pilot. This movement was conducted as a company during daylight hours in high desert terrain with easily accessible mobility corridors. The average speed for this movement was 40 KPH. B Company maintained the element of surprise by conducting an infiltration maintaining at least one major terrain feature between the company and the objective.

While setting conditions for the assault, B Company staged in an ORP two kilometers from the objective behind a small terrain feature. With conditions set, we moved into a linear formation to minimize the improvised explosive device (IED) threat and mask the size of the formation, increasing protection through dispersion of forces. We then moved rapidly to a piece of micro terrain that would serve as the assault position. The man-made berm, approximately five feet high, served as cover for the vehicles. Once at the assault position, we rapidly dismounted and conducted a selective clearance of the objective until we located the downed pilot. Once the downed pilot was located, two MRZR4s drove into the village to serve as casualty evacuation (CASEVAC) for both the pilot as well as injured paratroopers. After the casualties were moved to the assault position, we moved back to the lodgment.

Conducting this raid during daylight hours would not have been possible without the mobility platforms. The

distance was too great for dismounts to walk to the objective, improved roads were easily observed due to the lack of vegetation, and the enemy would have had advanced warning if Soldiers had air assaulted into the closest position that provided cover. The ability to move long distances through semi-restrictive terrain on LTATVs allowed us to attack the enemy from an unexpected direction at a time when they were unprepared.

Desirable Parameters Overview

During the proof of principle, we conducted a detailed analysis to determine what parameters are most desirable in an air-droppable LTATV for an IEF. We conducted qualitative and quantitative assessments, and we determined our desired parameters based on the experiences of our operators after spending an extensive amount of time tactically employing the vehicles. Our experiences validated most of the Army's GMV Capability Production Document (CPD) assumptions and key performance variables that would have application to IBCTs beyond the airborne GRF BCT and the system characteristics detailed in ONS 14-19635. In order of priority, the parameter groups we determined to be important are:

- Mobility and handling,
- Allowable cargo load,
- Strategic mobility (airdrop and airland),
- Modularity (the ability to be modified to fill a variety of roles by the user without the use of special tools or a forward support representative [FSR]),
- Auxiliary power generation for mission command equipment,
- Ease of maintenance,
- Safety,
- Ease of recovery,
- Fuel range,
- Egress (the ability to get in and out of the vehicle quickly with combat load), and
- Fire power.[11]

Rotary wing internal transport and slingloads for UH-60, CH-47, and CV-22 aircraft were not evaluated as part of our proof of principle.

Team- vs Squad-Sized Carriers

A discussion of desirable parameters is not complete without discussing the size of the element that each LTATV should carry. Team carriers are more maneuverable due to their smaller profile; their lighter weight enables the use of gap spanners and makes recovery easy. Greater dispersion of personnel allows for risk mitigation by decreasing the number of personnel that would be affected by IED or ambush. Team-sized carriers tend to be less durable due to the strength of key suspension parts; however, those parts can easily be changed on the move in an austere environment.

Squad-sized carriers allow for increased command and control as a result of decreasing the overall number of vehicles, maximizing airland capabilities, and increasing the number of leaders in each vehicle. The added space in the vehicle permits the use of larger fuel tanks and increased fuel range. The vehicles are heavier but tend to be more durable. However, the engines and suspension systems are larger and more complex.

An ideal fielding would include both team- and squad-sized vehicles, making a unit more adaptable to mission, terrain, and enemy. During the initial airfield seizure, the squad-sized carrier is the most efficient delivery via heavy drop or airland, allowing for the greatest number of seats per aircraft. The durability of the vehicle increases vehicle survivability during the airdrop and initial operations before mechanic support and parts can arrive. During the initial operation, risk of enemy contact during movement is mitigated by the overall surprise and speed we maintain. The rapid increase of combat power will catch the enemy off guard and mobility corridors will be open, free of IEDs and planned ambushes. For these reasons, the larger, more durable DAGOR is ideal.

When joint forces transition to sustained wide area security operations, out-of-sector missions become more common, and mobility corridors begin to close as the enemy becomes more familiar with our routes out of the airhead line or secured area. For these reasons, a team-sized carrier allows more protection as it increases the number of routes available and decreases the number of paratroopers exposed in a significant event.

The Polaris DAGOR, a squad-sized carrier, is effective for the GRF because it increases the strategic mobility of an airborne IBCT more than the MRZR4. A C-17 Globemaster III can airdrop eight of either variant per aircraft via a Dual Row Airdrop System (DRAS) platform. Translated to ground capability, it is the difference between 72 seats (8 x 9-man vehicles) delivered with the DAGORs per aircraft compared to 32 with MRZR4s (8 x 4-man vehicles). If conducting an airland operation, the difference is negated with 90 DAGOR seats (10 vehicles) versus 72 MRZR4 seats (18 vehicles) in a single C-17.

The MRZR4 is better suited for traditional light infantry units. The MRZR4's small size and capable off-road design allowed us to quickly traverse wooded terrain and thick foliage, previously considered severely restrictive to vehicular traffic. This allows a mobility-enhanced rifle company to move further and faster than their dismounted counterparts. The vehicles can travel wherever infantry would typically walk, thereby allowing formations to move faster, carry more, and significantly reduce combat fatigue compared to a dismounted element. Of note, the MRZR4 is an excellent vehicle for conducting an infiltration; it is audibly undetectable one minor terrain feature away from the objective, where a light infantry platoon would establish its ORP.

Recommendations

Our proof of principle confirmed most of the Army's GMV Capability Production Document (CPD) assumptions and key performance variables that would have application to IBCTs beyond the Airborne GRF BCT with two notable recommendations. The power generation for vehicle-mounted Single Channel Ground and Airborne Radio Systems (SINCGARs) and beyond-line of sight communications on select leader vehicles is a critical capability not originally reflected in the CPD. However, recent discussions with the MCoE indicate that mission command equipment is now a critical capability. Unaddressed, the lack of mission command systems negates the increased range and mobility we are seeking to create with the vehicles. Additionally, the CPD was originally written for a squad carrier. To achieve the intent of avoiding mobility corridors and travelling in restrictive terrain with dismounted infantry, the Army's program should consider smaller team-sized carriers that can double as a modular medical, mortar, heavy weapons, or logistics vehicle. MCoE and the Army Capabilities Integration Center should apply the 82nd Airborne Division's lessons learned to their GMV program, but the requirements and operating assumptions for employment are significant enough to decouple the acquisition milestones and key parameters from the Army's Program of Record and the 82nd Airborne Division ONS.

The 82nd Airborne Division, as a designated IEF, will likely be able to leverage strategic surprise while traversing mobility corridors or rapidly repositioning friendly forces. Follow-on forces will not have the same surprise advantages and will need vehicles that can bypass traditional mobility corridors and infiltrate with the dismounted infantry. The 82nd Airborne Division should continue to expand its LTATV fleet consistent with the current ONS of equipping the GRF IBCT's three infantry task forces with enhanced mobility and providing a training package for the GRF 2 in its Intensive Training Cycle.

A second LTATV purchase consisting of 35 Polaris DAGORs (9-seat variant) should be immediately executed, leveraging their demonstrated versatility and durability, strategic mobility benefits, gun-ring option, and increased power generation for vital mission command systems. The MRZR4 is very cost effective and more advantageous in restrictive terrain. However, we shouldn't continue to invest in MRZR4 motor gasoline (MOGAS) variants when a turbo diesel option will soon likely be available for delivery. Over the next six months, a more thorough proof of principle can be conducted on the DAGOR 9-man variant before finalizing our requested basis of issue and completing the ONS.

Notes

[1] U.S. Department of Defense, "Sustaining U.S. Global Leadership: Priorities for 21st Century Defense," (January 2012): 7, accessed 13June 2016 at http://archive.defense.gov/news/Defense_Strategic_Guidance.pdf.
[2] Joint Chiefs Of Staff, *Joint Concept for Entry Operations* (Washington: U.S. Government Printing Office, 2014).
[3] Ibid.
[4] Ibid.
[5] BG Christopher Cavoli, Operational Needs Statement- Enhanced Tactical Mobility for the Global Response Force — (ONS 14-19635) (Fort Bragg: 82nd Airborne Division, 2014).
[6] Joint Chiefs Of Staff.
[7] Army Capabilities Integration Center, "Army Ground Mobility Vehicle" (presented Fort Eustis, VA, 10 July 2015);

Capabilities Development Integration Directorate, "Operational and Organizational Concept for Future Forced Entry Operations 2020-2040" (Fort Benning, GA: Maneuver Center of Excellence, 2015).

[8] Of note, Army G3/5/7 changed the program name to Ground Mobility Vehicle (GMV), not to be confused with the AM General SOF Variant HMMWV or the USASOC GMV-R 1.1 program of record.

[9] BG Cavoli, ONS.

[10] Matthew Boyer, Michael Shurkin, Jonathan P. Wong, Ryan Schwankhart, Adam Albrich, Matthew W. Lewis and Christopher G. Pernin, "Assessing Conventional Army Demands and Requirements for Ultra-Light Tactical Mobility," (RAND Corporation, 2015); http://www.rand.org/pubs/research_reports/RR718.html.

[11] Kenneth Burgess, Virgil Barnard and Michael Bouchard, "MRZR4 LTATV Proof of Principle Final Report" (Fort Bragg: 1st Battalion 325th Airborne Infantry Regiment, 2015).

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