

# ARMY TRUCK PROGRAM (TACTICAL WHEELED VEHICLE ACQUISITION STRATEGY)

REPORT TO THE CONGRESS



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## EXECUTIVE SUMMARY

The Explanatory Statement in Division A of the Department of Defense Appropriations Act, 2010 (Pub. L. 111-118) directed that, “Not Later than 180 days after the enactment of this Act, the Secretary of the Army shall provide a report to the congressional defense committees detailing the Army’s acquisition strategy for future truck procurement.” The relevant language on page 190 is as follows:

*Concerns persist regarding the absence of an overall truck acquisition strategy to guide the Army’s plans and programs. It is not clear that the Army has conducted the needed analyses for sound acquisition plans or to reap potential savings. Not later than 180 days after the enactment of this Act, the Secretary of the Army shall provide a report to the congressional defense committees detailing the Army’s acquisition strategy for future truck procurement.*

This report responds to the Congressional concerns expressed regarding the Defense Department’s Fiscal Year (FY) 2010 budget request by delivering an Acquisition Strategy that has evolved from its inception through the incorporation of the 2008 Army and U.S. Marine Corps (USMC) Joint Tactical Wheeled Vehicle (TWV) Strategy, the 2009 Army Equipping Strategy, TWV Vehicle Investment Strategy, and the 2010 Army Modernization Strategy. These strategies are developed with appropriate fleet analysis, capabilities assessments and available investments to balance sound acquisition plans with necessary sustainment of current fleets.

Overall, the Army is approaching the completion of procurement to meet the Army Acquisition Objective (AAO) for the TWV fleets. However, the remaining challenge is to ensure we achieve the right mix of variants while modernizing to a “scalable armor” fleet and one that is capable of supporting Army plans to continue network modernization. The past decade has resulted in a dramatic increase in the wear and tear of the TWV fleet based on Operational Tempo (OPTEMPO) increases. Current efforts in support of Overseas Contingency Operations (OCO) coupled with obsolete components have continued to increase the operational and support costs. However, the knowledge gained from the past ten years has provided critical insights in the area of force protection, mobility, payload, reliability and maintainability of the fleet.

Congress and the American people have consistently supported the Army’s need for a healthy TWV fleet. From 2003 to 2010, Congress has provided \$43 billion towards procurement and recapitalization of TWV vehicles. In addition, Congress appropriated \$2 billion towards Repair (Sustainment), a sub-set of Reset.<sup>1</sup> As a result of these investments, the TWV were effectively restored from wear and tear experienced in combat operations and realized equipment availability at or greater than 90% for the last eight (8) years of the war.

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<sup>1</sup> POM Budget builds (2003-2010) & OPS 29 resourcing (2004-2010); OPS 29 includes heavy trailer and Armored Security Vehicle (ASV).

The TWV fleet has multiple age ranges depending on vehicle category. For example, the Heavy Expanded Mobility Tactical Truck (HEMTT) averages 17 years, while 40% of the Medium Tactical Vehicle fleet and the High Mobility Multipurpose Wheeled Vehicle (HMMWV) utility fleet exceed 18 years. These vehicles require particular attention and investment. The Light Tactical Wheeled fleet makes up 59 percent of the entire TWV fleet (Light, Medium, and Heavy).

The Army's strategic objective is to develop a flexible strategy with the ability to adapt to change, and to mitigate the risk of uncertainty caused by an evolving threat. We must be able to change our force structure to meet our contingency operations, and react to changes in the economy that impact the Army budget. Our acquisition strategy must incorporate fleet management processes that track fleet metrics and inform fleet decisions. The Army's acquisition strategy must enable competition and industry partnering. Our strategy must also be agile enough to shift resources in order to effectively manage uncertainty and promote fiscal stability across the fleet.

The sheer magnitude of the 260,000 TWVs in the Army represents an initial procurement investment of \$50 billion (trucks only), makes managing the fleet a challenge<sup>2</sup>. Finding the right balance and mix of TWVs requires the Army to continually assess and adjust investments. Managing this fleet effectively goes beyond simply buying new vehicles as the existing vehicles age beyond their useful life. The Army will use a combination of new procurement, repair (Sustainment), recapitalization (RECAP), and divestiture to achieve our strategic objective by addressing the readiness and mission issues of the fleet.

The Army plans to implement these tools (new procurement, repair, recapitalization, and divestiture) across the fleet to provide the best mix of TWVs as we move from the FY 2010 on hand inventory to an estimated FY2025 requirement of 244,000 trucks (Figure 1). This approach supports the Army's 2010 Modernization Strategy "efforts to ensure that Soldiers have the best equipment and necessary capabilities to guarantee their success in any mission or environment".<sup>3</sup> The approach described above is also in line with the 2008 Army and USMC Joint TWV Strategy's four tenets:

- Take maximum advantage of existing platforms through RECAP, reset, and product improvement efforts.
- Plan for the integration of the Mine Resistant Ambush Protected (MRAP) Family of Vehicles (FoV) into the fleet mix.
- Emphasize a mixed fleet approach that spans the "Iron Triangle" of Protection, Payload, and Performance.
- Move the Army to a fleet of TWVs that have scalable protection (integrated A-Cabs and Add-on-Armor (AoA) B-Kits)

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<sup>2</sup> Only represents initial truck investment (does not include trailers, ASV, or support requirements); source: P Forms.

<sup>3</sup> 2010 Army Modernization Strategy, pg 3.



**U.S. ARMY**

# TWV Acquisition Strategy

	<u>NOW (2010)*</u>	Tactical Wheel Vehicles Strategic Actions	<u>FUTURE (2025)</u>
	260,000		244,000**
	+19,000 Due in		
LTV	50,000 UAH	Sustain (RECAP/Reset /Divest)	50,000
	+9,000 Due-in		
	51,000 HMMWV Utility	Sustain (RECAP/Divest)	35,000
	50,000 HMMWV (Over age) 0 Joint Light Tact Veh	<b>Sustain (Reset/Divest) &amp; replace w/ JLTVs</b> Procure New	TBD JLTV
MTV	44,000 FMTV	Sustain (Reset), Procure New	76,000
	+7,000 Due-in		
	28,000 M35/800/900 series	<b>Divest &amp; replace w/ New FMTVs</b>	
HTV	26,000 Unarmored	RECAP to Armor Ready or Divest	
	11,000 "Armor Ready"	Sustain (Reset/RECAP), Procure New	34,000
	+3,000 Due-in		
MRAP	19,000 MRAP & ATVs	Sustain (Reset/Modify/Divest)	15,000

Reset = Repair (Sustainment) maintenance to 10/20 Standards

Recap = Recap with Base \$

\* Includes what is currently on hand as of 30 April 2010 LIDB On Hand assets by MACOM plus remaining deliveries for FY10. Total does not account for divestiture quantities.

\*\* Actual reductions pending ARCIC Study, Truck Reduction Study Phase II

**Figure 1. (TWV Acquisition Strategy)**

# PURPOSE OF THE REPORT

## Scope

The scope of the TWV Acquisition Strategy and this report includes the Light, Medium and Heavy TWV Fleets. It also includes the integration of the MRAP's into the force structure and the Joint Light Tactical Vehicle (JLTV) into the Light TWV Fleet. This report and the TWV Acquisition Strategy do not include the Armored Security Vehicle, Stryker or any other wheeled vehicle in the Army inventory.

## Assumptions

The following assumptions were made during the development of TWV Acquisition Strategy:

- The Army will continue to be in persistent conflict for the foreseeable future.
- The emerging reduction in available resources and the simultaneous increase in legitimate requirements will continue to be a challenge into the future.
- Future Equipping requirements for the TWV fleet will be based on the Army Force Generation (ARFORGEN) model.
- The Army will incorporate MRAPs into the Army Force Structure.
- The Army will continue to balance acquisition strategies to meet strategic fleet requirements.

## Constraints

There are several key TWV documents that are currently not approved and are being worked that have influenced the Army's overall TWV Acquisition Strategy:

- The Draft TWV Long-Term Protection Strategy (LTPS)
- G-8 initiated TWV Strategy Update
- Phase II of the U.S. Army Training and Doctrine Command (TRADOC) Truck Study
- Department of Defense Cost Assessment and Program Evaluation (CAPE) Study for the Family of Medium Tactical Vehicles (FMTVs)

# BACKGROUND

## The Past

Prior to the events leading up to September 11, 2001, the main focus of effort on the TWV fleet consisted primarily on vehicle performance and payload. The general assumption was that the battlefield was linear, such that combat vehicles positioned forward in formations required protection from enemy fire, but tactical vehicles providing support functions did not. The result was a fleet designed without the burden of armor protection and the corresponding automotive impacts that potential add on armor would have on critical truck sub-components like the engine, suspension, transmission, and axles.

In addition, the TWV fleet of the 1990's was based on pure-fleet unit-set-fielding prerogatives. Requirements, shortages, and priorities were determined by a tiered readiness system – meaning some units were equipped well, other less well. The goal was to equip units based on their position on the Department of the Army G3 Priority list. Under this system requirements were approved, then resourcing costs considered. In most cases the Army lacked the fiscal budget to equip to its goal of 100% of a unit's requirements. Typically, the Active Component (AC) received the newest equipment while the Reserve and National Guard received displaced equipment from the AC based on a cascading methodology. Requirements for Homeland Defense were not well understood, or apparent within the Army.

## The Present

The events following September 11, 2001 and the beginning of the Global War on Terrorism had a significant impact on the TWV fleet, in particular, the need for armored trucks. Assumptions about the linear battlefields of the Cold War gave way to the complex, urban terrain and Field Operating Base (FOB) based operations of Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF). Without a front line, all vehicles proved to be targets of enemy fire, particularly emergent threats of improvised explosive devices (IEDs) that would drive the need for greater and greater protection levels across the truck fleet and the emergence of Mine Resistant Ambush Protected (MRAP) vehicles designed specifically to meet the IED threat.

The immediate call for armor was answered by two applications. “Bolt-on” or “add-on armor” (AoA) solutions and locally fabricated solutions. The AoA solutions were less than ideal because the armor was added as an afterthought and the vehicles themselves were not designed to handle the additional weight. Most armor kits weighed 3,000+ pounds and early versions of TWV required sturdier suspensions and more powerful engines in order to withstand the weight of the armor. The light tactical vehicles like the High Mobility Multipurpose Wheeled Vehicles (HMMWVs) were especially impacted given their smaller margin to accept added weight.



Armor solutions and the trucks that they reside on have continued to evolve based on lessons learned from combat. In addition, the 23 June 2005 Joint Requirements Oversight Council Memorandum (JROCM) mandated that all manned vehicles from hence forth would have force protection and survivability Key Performance Parameters (KPPs). Figure 2 shows the evolution of the Family of Medium Tactical Vehicles (FMTVs) for both the truck and armor.



**Figure 2. (FMTV Evolution)**

The FMTV program started out with a version of bolt-on- armor called Radian Armor Crew Kit (RACK) and like most AoA, proved to be a short term solution. The Low Signature Armored Cab (LSAC) followed the RACK and replaced the FMTV's light skin cab altogether. The LSAC afforded more protection for the crew compared to the RACK, but it too had limitations. The increased weight on the front axle caused several issues for the FMTV truck, such as component fatigue and inability to meet its requirement to be transportable by C-130. The most recent armoring solution for FMTV is called the Long Term Armor Strategy (LTAS), which provides the warfighter with scalable armor. The FMTV's LTAS supports the Army's Draft Long-Term Protection Strategy (LTPS), which has a desired end-state of providing the warfighter with

protection and survivability capabilities to conduct missions across the full spectrum of operations.

The LTPS's approach reflects a scalable armor concept that allows a unit to adjust the level of protection on a vehicle based on the mission and the threat. In the case of the medium and heavy TWV fleets, an A-Cab and B-Kit concept was developed to provide the LTPS's desired scalability factor. The A-Cab is designed to accept additional armor in the form of a B-Kit. The A-Cab/B-Kit concept allows the Army flexibility in several areas: the armor B-Kit can be taken off when not needed – reducing unnecessary wear and tear on the vehicles; the Army can continue to pursue upgrades in armor protection – adapting B-Kits to match the threat; and the versatility of the B-Kit enables the transfer of armor from unit to unit – makes armor requirements affordable by pooling assets versus buying armor that is only for one vehicle. The Army plans to buy only a portion of the B-Kits called out in the LTPS to meet immediate needs, while investing Research, Development, Test and Evaluation (RDT&E) dollars into developing upgraded armor B-Kits in order to continue to evolve armor capabilities to match emerging threats. This strategy will help guarantee that our Soldiers receive the best armor possible, while at the same time ensuring that Army investment resources are not wasted on armor inventories made obsolete by the newest threat. Therefore it is necessary to ensure that LTPS requirements are integrated into Joint Capabilities Integration Development System (JCIDS) requirements documentation including, Capability Development Document (CDD) and Capability Production Document (CPD), across the entire fleet.

Changes to the Army force structure and how the Army equips the new force structure continues to mold TWV requirements with respect to quantity and quality metrics. In 2003, the Army's Modularity Plan called for the U.S. Army (all components), to increase the number of brigades in the force from 58 to 73, resulting in an increase of nearly 40,000 vehicles. The Army also adjusted the way it looks at equipping units by implementing the Army Force Generation (ARFORGEN) model. The ARFORGEN model focuses on cyclical readiness rather than the Cold War era of tiered readiness, which means that units are equipped based on their position within the ARFORGEN cycle and their mission, regardless of component.

## **The Future**

The future of the TWV fleet and its ability to meet future needs is being shaped now. The Army will continue to try to find the right balance between the 3-Ps (payload, protection and performance) for the fleet, while at the same time optimizing to a modernized fleet that is capable of hosting the wide range of advanced electronics that have become commonplace on the battlefield. It is assumed that an age of persistent conflict will be the backdrop for the foreseeable future and that the Army's TWV Acquisition Strategy must be agile enough to respond to evolving threats. Sustainability and affordability will continue to shape the future fleet decisions with respect to the right blend of quantity and quality; however Soldier protection will weigh heavily in our decisions.

# TACTICAL WHEELED VEHICLE ACQUISITION STRATEGY

The TWV Acquisition Strategy is a subset of the overall Army TWV Modernization Strategy. The Modernization Strategy provides the Army with a flexible, affordable and sustainable strategy that will equip our forces through a balanced resourcing manner. The Army's approach remains focused on providing those capabilities necessary for the current deployed modular force at war today, while simultaneously supporting a transformation process to ensure that those capabilities essential for the future are being developed.

## Strategic Goal

Our strategic objective for the TWV Acquisition Strategy is to have the ability to adapt to change and mitigate the risk of uncertainty caused by an evolving threat, change to our force structure to meet our missions and changes in the economy that impact the Army budget. This acquisition strategy aims to incorporate fleet management processes that track fleet metrics and inform fleet management decisions; enables competition and partnering; strives to be agile enough to shift resources when needed to effectively manage uncertainty and promote fiscal stability across the fleet.

## Methodology

- **Fleet Management:** The TWV Fleet Management process is the main mechanism used by the Program Executive Office of Combat Support and Combat Service Support (PEO CS & CSS) and the Project Manager for Tactical Vehicles (PM-TV) to make informed decisions about the fleet. The process enables fleet managers to baseline the current fleet in terms of fleet metrics - the percentage of fill (shortages), average age of the fleet, percent of the fleet that is armored and other fleet quality factors. This baseline is then matched against Army objectives for each fleet that are outlined in the Army's strategies like the TWV Investment Strategy to determine the way ahead and intended areas of risk.

Investment courses of action (COAs) are then developed. These COAs, once vetted are provided to Headquarters Department of the Army to inform POM builds. The COAs typically vary by the different fleet attributes or levers (% Requisition fills; Average Fleet Age; % Armored, etc). The goal is to provide the best fleet mix and quality possible to meet the Army's needs within the resources available. It is the fleet management process that enables effective cost-benefit-analysis and provides industrial base impacts, which inform Senior Army Leadership decisions in terms of where to manage fleet risk.

The process is intended to be an annual process that is matched with budgetary cycles. The end result is a blueprint to guide the Acquisition Community's efforts

with regard to new procurement, recapitalization, repair (sustainment), and divestiture – the means or tools to execute the Army’s Acquisition Fleet Strategy.

- **Encourage Competition:** The Army must continue to exercise competition as part of its acquisition strategy for the TWV fleet. Competition improves quality and reduces costs, while providing the Army access to a full range of industry (depot, private, or public/private teaming) capabilities, processes and potential technical advances. Ownership, or access, of Technical Data Packages (TDPs) by the Army is a key enabler for promoting competition. The Army, where prudent, is buying the TDPs for our TWV fleet vehicles in order to not only complete contracts for new procurement, but also for recapitalization and sustainment contracts as well. The recent contract award for the Family of Medium Tactical Vehicles (FMTV) provides an excellent example of how competition reduces costs. The new contract award represents a 28% savings over the old contract, which was a sole-source contract. Competition also cultivates a strong industrial base and provides early warning indicators if the industry base may be consolidating or shrinking.

The Army is currently exploring opportunities for a potential competitive RECAP/protection modifications program for Up Armored High Mobility Multipurpose Wheeled Vehicles (UAHs). The intent is to capitalize on the strengths of competition to deliver a quality product at the best competitive price, while promoting potential partnering between organic (Army Depots) and commercial entities. This initiative supports the TWV Investment Strategy guidance to “prioritize the modernization of armor-capable armament carriers ahead of any other variant and to leverage the complete industrial base (sustainment level repair and original equipment manufacturer (OEM)) capabilities as a modernization tool to support sustainment”<sup>4</sup>.

- **Shift Resources and Emphasize fiscal stability:** It is imperative that the TWV Acquisition Strategy acknowledges and recommends the need to shift resources from traditional new procurement to Modifications-in-service, RECAP and Service Life Extension Programs. The readiness to make changes to resources will allow the Army to mitigate risk and adapt to emerging requirements.

The ability to shift resources also supports the need for a steady and constant level of funding. Without fiscal stability, the Army will have a difficult time with its initiative to use long-term contracts (five years) with industry to ensure surge capability and promote a healthy industrial base. Lessons learned from the early days of OEF and OIF demonstrate that having a warm production line (new procurement or recapitalization) is crucial to responding quickly and effectively to unforeseen requirements. The Army has a contract and production capability that can be adjusted and modified to meet emerging Army requirements verses either having no contract/production in place or a multi-year contract that locks the Army into five years of production, which provides little flexibility to adjust or

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<sup>4</sup> The Army Tactical Wheeled Vehicle Investment Strategy, 30 October 2009, pg 11

shift from the original plan. Moreover, this strategy underlines the idea of “buy less, more often” which allows maximum flexibility and technology insertion, thereby reducing risk of obsolescence in the face of a highly adaptive enemy.

## Implementation

The Army has four main tools or means of shaping the TWV fleet status:

- **New Production:** The TWV fleet has enjoyed much needed support from Congress in support of new procurement to help the TWV fleet meet theater and force structure requirements. New procurement is the Army’s primary mechanism to fill shortages in both quantity and quality with a focus on the Army’s goal to have a tailorable, versatile, and technologically modern TWV fleet mix.
- **Recapitalization:** Provides another means to modernize the fleet, but at a reduced cost compared to new procurement. RECAP efforts enable the Army to leverage previous investments in a cost effective manner and affords the opportunity to expand beyond a vehicle’s current configuration by potentially interjecting new technologies that provide new capabilities or address obsolescence. RECAP efforts have also afforded the Army a means to rapidly respond to emerging requirements informed by theater lessons learned. Most of the technologies incorporated are mature technologies available from private industry.
- **Repair (Field & Sustainment Level Maintenance):** Is a subset of the Army’s Reset strategy and is intended to repair and maintain equipment to the 10/20 series Technical Manual standards (and in the case of Reset associated with operations in Southwest Asia, to mitigate delayed desert damage), while maintaining current configuration. Field-level repair is generally performed by the owning unit, with Soldier maintainers, sometimes augmented by Department of the Army civilians and/or contractors (particularly during Reset), and is usually performed at installations where the equipment is stationed. Sustainment-level Repair accomplishes that portion of the maintenance mission that is beyond the capability or capacity of the field-level environment; performed under the management of the Army Material Command, at a Depot or regional repair facility.
- **Divestiture:** An effective divestiture plan is crucial in maintaining a sustainable and viable TWV fleet. Planned divestitures of TWVs helps rebalance the fleet in terms of reduction of sustainment costs (Parts, Training, Manuals, and Manpower), focuses on increased capabilities and reduces the average age of the fleet. The TWV divestiture strategy looks at removing excess and obsolete vehicles from the inventory. Candidates that remain after an internal/external component redistribution and which do not meet established retention criteria will

be divested from the inventory. This is a continuous process of balancing the fleet to maintain the most capable and reliable vehicles.

The TWV Investment Strategy calls out several variants that are slated for divestiture from the fleet. In the case of the Medium Tactical Vehicle (MTV) Fleet, the Army's truck divestiture plan calls for complete divestiture of all M35 2.5-ton vehicles by the end of FY11. The current 2.5ton fleet is rapidly becoming unsupportable due to age and obsolescence. An inordinate number of man-hours are expended yearly to maintain this fleet in an operable condition and it is not armor capable. The MTV divestiture plan includes the divestiture of all M809-series vehicles by the end of FY15 and of all M939-series trucks by FY22, pending receipt of requested funding.<sup>5</sup>



### Fleet Implementation Strategy

1. Shortages/Capability gaps will continue to exist
2. RECAP is a long-term, continual process
3. We need to emphasize a steady, constant stream of funds
4. A need will remain to build an industrial surge capacity to balance the risk associated with divestiture of our legacy vehicles and the establishment of a sustainable investment.

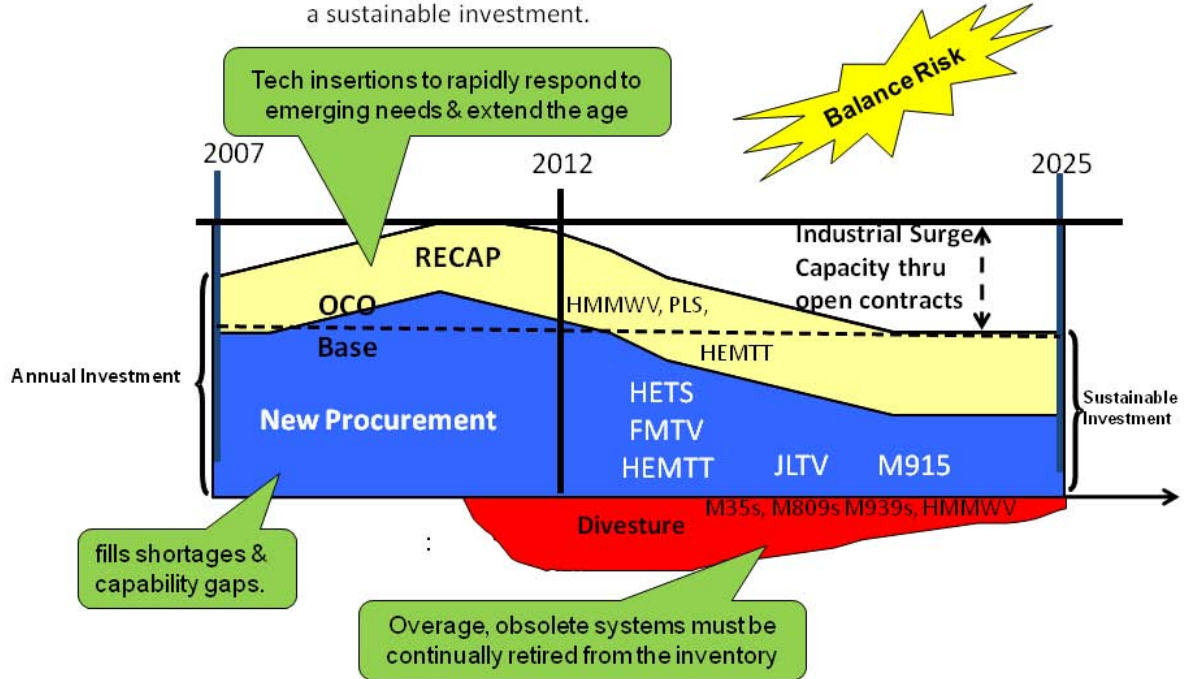


Figure 3. (Implementation)

<sup>5</sup> The Army Tactical Wheeled Vehicle Investment Strategy, 30 October 2009, pg 13



## Fleet Metrics

There are three main metrics that are used to characterize the health and readiness of the TWV fleet: **Percentage of Requirement Fill** – how close the Army is to procuring its requirements; **Percentage of Armor** – the percentage of the fleet that has armor (B-Kit); and **Fleet age/Usage** – the average age for a given fleet. Economic Useful Life (EUL) – typically defined as that age (number of years) after which an asset is no longer “fit for use” is often used as a backdrop for fleet age/usage to help make decisions concerning the fleet.

These three metrics along with EUL also define the Army’s trade space in regard to how the Army manages risk within the TWV fleet based on resource constraints. The Army is attempting to restore balance among the twin levers of quantity and quality through the execution of the Program Objective Memorandum (POM) informed PEO CS&CSS Fleet Management Plans. It is the Fleet Management Plans that identify how many trucks the Army should procure, sustain, RECAP, and divest in order to achieve the desired fleet outcomes (% of Requisition fills, % of Armor, and Average Fleet Age/Usage) given fiscal funding constraints.

- **Percentage of Requirement Fill:** The percent of requirement fill refers to what the Army is short in terms of quantity and quality (on hand numbers) compared to the Army’s requirements. The TWV fleet is quickly approaching its overall requirement numbers, but much of the fleet consists of older vehicles that lack desired capabilities or modernization, such as being armor-capable. In the case of the LTV fleet, the Army will have procured all the Army’s requirements for HMMWVs by the end of fiscal year 2010. The focus for the LTV fleet is to rebalance the quality lever by concentrating on HMMWV recapitalization and divestiture efforts in order to help modernize the fleet in terms of reliability, protection and performance. Though it is important to note that the HMMWV will continue to play a major role for many years, the HMMWV RECAP is a critical bridge to JLTV.
- **Percentage of Armor (B-Kit):** This metric is based on the Army’s Long-Term Protection Strategy base vehicle and protection kit concept. The LTPS calls for certain percentages of Armor B-Kits for each of the fleets (LTV = 32%, MTV = 33%, and HTV = 47%). Percentage of armor provides a snap shot of the TWV armor status based on the number of trucks in each fleet that has a B-Kit or scalable armor. Another facet is the number of trucks that are able to accept B-Kits, which are termed “armor capable”.
- **Fleet Age/Usage:** The goal of fleet management is to establish a fleet baseline (current snapshot of the fleet) by looking at metrics such as average fleet age and condition. The next step is to develop COA's which include procurement, RECAP and divestiture mixes to look at aging trends to help determine what the fleet will look like in the future and how long it will take to achieve various levels of modernization. Economic Useful Life (EUL) is the benchmark that fleet

age/usage data is compared against in order to manage and understand risk. EUL is typically defined as that age (number of years) after which an asset is expected to require an unacceptable level of maintenance and or experience reduced availability. EULs that are currently being used for the TWV fleet are as follows: HMMWVs =15 yrs, FMTV = 20 yrs, and HTV = 20yrs.

EULs for the TWV fleet are potential trade space for the Army when it comes to trying to rebalance the fleet. The Army can and has decided to retain vehicle's beyond its EUL or to extend its useful life through Recapitalization or simply accept the added operational and maintenance costs associated with keeping a certain variant in the inventory for longer than its intended use. For example, the M35, 2.5ton medium tactical wheeled vehicle was designed in the 1950s and is still in the inventory. Within a vehicle's lifetime there could be new rules for emissions that haven't even been proposed yet or maybe new technology that has yet to be invented that may make a certain vehicle or major component of the vehicle obsolete. The M35 falls into this category and is currently being divested. Essentially the Army must balance between resources available, desired capabilities and costs associated with supporting a legacy fleet.

<b>Vehicle Class</b>	<b>% of FY17 Req Fill*</b>	<b>Avg Age</b>	<b>EUL (yrs)</b>	<b>Protection Kit Requirement (LTPS)</b>	<b>OH Armor Quantity</b>
LTV	100%	12.3	15	47,183	21,063**
MTV	92%	13.7	20	26,594	9,503***
HTV	101%	17	20	18,108	10,473****

Data based on 30 April 2010 LIDB On Hand Assets by MACOM

\*FY17 Requirements from SACS pull March 2010 and includes only MTOE + TDA Requirements

\*\* Number is based on Frag Kit 5 OH inventories for HMMWVs; \*\*\* AOA & B-Kits; \*\*\*\*LTAS, AOA, & B-Kits

**Table 1. (TWV Fleet Metrics Status)**

Today's TWV fleet is valued at over \$50 billion (trucks only), while the future replacement cost are estimated at \$80-90 billion, primarily due to increased requirement for crew protection. A strategy that involves nothing but simply maintaining the current fleet makeup through replacement of 1/20 of the fleet every year would cost the government over \$4 billion annually over the average 20 year Life Cycle (includes JLTV investment for the LTV Fleet). A strategy of this form is not sustainable year after year. In an effort to address sustainability, the Army must mitigate risk by simultaneously exercising three fleet levers: reduce TWV fleet requirements, extend each fleet's EUL, and balance modernization efforts by altering new procurement and recapitalization levels. Each lever on its own only represents potentially 20% cost/avoidance savings, but by combining all three levers the Army can potentially realize up to a 50% cost/avoidance savings to foster a stable annual investment that is affordable and sustainable. Any further cost reduction would represent unacceptable risk.



# FLEET ACQUISITION STRATEGIES

## TWV Investments

**RDT&E Efforts:** In general (with the notable exception of armoring technologies and approaches), the Army's TWV fleet is modernized by taking proven commercial technology and adapting, integrating, and testing it for military applications. However, RDT&E investments still remain an important effort for the fleet. Besides the significant RDT&E investment being made for JLTV and armor development, the Army continues to seek improvements for the rest of the fleet through various RDT&E endeavors: integration of commercial components with military applications; enhanced suspensions aimed at improving off road mobility and transportability; off board power initiatives to support Counter – Improvised Explosive Device and network equipment that reside on TWV vehicles; and exploration into materials and technologies that help reduce weight and fuel consumption.

As the Army continues to modernize its fleets, RDT&E will be needed to pursue prototyping, integration, and testing for modernization and even recapitalization where improvements in performance over currently fielded platforms.

**Training and the use of Simulation:** The US Army Operator Driving Simulator (USAODS) was procured by the Product Manager, Heavy Tactical Vehicles (HTV) approximately 10 years ago. The initial total was 47 simulators, later supplemented with 26 additional simulators for a total of 73 fielded devices. The newest systems were delivered in March 2006. Because of their age, and increasing advances in training and simulation technology, the ODS are in immediate need of either a major technology refresh or total replacement due to spiraling supportability costs and increasing performance issues.

The Army has fielded a potential technical solution in the Common Driver Trainer (CDT) program. The Stryker, the Abrams tank (including tank engineering variants), and the Mine Resistant Ambush Protected (MRAP) Family of Vehicles (FoV) all have developed and fielded CDTs. The CDT features the latest in technology, and is based on a product line approach that is easily leveraged for other vehicle variants.

The use of simulation training is crucial in support of an ARFORGEN equipping strategy. As units move into the reset phase of the ARFORGEN model, simulation trainers like the Common Drivers Trainer (CDT) will play a pivotal role in individual and unit training goals due to the lack of actual equipment to train on. Training with simulations is nothing new to the Army and advances in simulation technologies have increased the benefits (improved throughput, reduced costs as budgets decrease and fuel price rise, improved safety and accident reduction, commonality and dual use training, and ability to rapidly change training to mirror changes in software/hardware or

changes in Tactics, Techniques and Procedures (TTPs)) to units that incorporate simulations into their training regiments.

## **Light Tactical Vehicle (LTV) Fleet**

**Fleet Description:** The Army's LTV fleet consists of the High Mobility Multipurpose Wheeled Vehicle (HMMWV) Family of Vehicles (FoV) and the future Joint Light Tactical Vehicle (JLTV) FoV. It is comprised of 18 variants, which support three (3) specific mission sets. These are the light armored combat vehicle (armament carriers), shelter carrier/ground ambulance vehicles and command and control/light cargo vehicles (light utility vehicles). Each of these variants has a specific mission set and are managed based on their individual mission requirements.

**Armament Carriers** – The armament carrier fleet is comprised of several legacy models (M1025, M1026) and the current the Up-Armored MMMWV (UAH) models (the M1114 and M1151A1 (armament Carriers)), and the M1167 (TOW/ITAS) variants.

**Shelter Carrier and Ground Ambulance Vehicle** – The shelter carrier variants include the legacy variants (M1037) and the expanded capability vehicle (ECV) variants (M1113 and M1152A1). The M1152A1 is the replacement for the M1113 and shares the same chassis with integrated modular armor. The M996 and M997 Ambulance variants were produced up to 1998 and a new variant is under production combining the original ambulance box with the latest M1152A1 chassis.

**Light Utility Vehicle** – The M998, M1038 and M1097 variants are some of the oldest Light Utility Vehicles in the Army today. These vehicles offer no ballistics protection and in general, do not possess a sufficient payload or the automotive performance that would allow future RECAP efforts to transform them into UAH configurations. However, they do meet Army requirements for some operational themes that take place in lower levels of violence across the spectrum of operations as well as garrison based support and administrative operations within Continental United States (CONUS). There will also be over 12,000 M1165A1 UAHs on hand by the end of FY10, offsetting the impact of the vehicles beyond their EUL.

**Joint Light Tactical Vehicle (JLTV)** – The JLTV is the future light tactical vehicle for the Joint Force. It will balance the “Iron Triangle (protection, performance and payload)” and buy back performance and payload lost by the armoring of the HMMWV and defines the LTV in terms of Rotary Wing and APF transportability. It will also provide for new missions in Long Range Surveillance and Light Infantry Ground Mobility. Some improvements over the HMMWV include operational range; transportability; Command, Control, Communications, Computers, and Intelligence (C4I); Interoperability; increased mobility; increased protection without payload degradation; reduce life cycle cost; and increased commonality.

**Fleet Status:** Based on production there is approximately 86,000 HMMWVs which exceed their Equipment Useful Life (EUL) of 15 years. Over 43,000, of those 86,000

HMMWVs, have undergone an extensive recapitalization effort. The majority, 27,000, of the variants in the remaining 43,000 HMMWVs is beyond their EUL and is light utility variants.

The FY17 requirement for the LTV FoV is 150,029 vehicles. Currently, approximately 1/3 of the HMMWV fleet consists of older Utility HMMWVs which have an average age of 22 years, another 1/3 of the fleet are recapitalized utility vehicles with an average age of 3 years and the remaining 1/3 of the fleet are UAHs. Neither the legacy nor the light utility vehicles are armor capable systems.

**Fleet Acquisition Strategy:** By FY10, the Army will have satisfied the quantity requirement for light tactical vehicles through the HMMWV program. The Army has reached its Acquisition Objective (AAO) for LTVs earlier than expected based on lower than anticipated number of battle losses, maintenance washouts and HMMWVs that were planned to be left in theater as part of Theater Provided Equipment. In addition, the fielding of Mine Resistant Ambush Protected Vehicles (MRAP) and MRAP-All Terrain Vehicles (MATVs) in response to the need for more Soldier Force Protection led to the Army's decision to cease new HMMWV procurement in FY10. Beyond FY10, the strategy for the LTV fleet shifts to a combination of divestiture, sustainment and modernization through RECAP for HMMWVs and new vehicle procurement for JLTV.

The desired end state of the LTV fleet by CY2017 is for the Army to be in the process of fielding the advanced capabilities of JLTV while divesting older HMMWV utility variants in order to keep the total number of the vehicles within the Army requirement, drive down fleet age and help reduce the fleet's Operations and Support (O&S) costs – the older the vehicle the higher the O&S costs to maintain it. Divestiture will also enable the elimination of the least capable vehicles in the fleet. At that time, the Army also intends to have established cost effective options for sustaining and modernizing the existing UAH fleet through recapitalization. The average fleet age by 2015 is estimated to be approximately 15 years.

The goal by the end of 2025 is to have a fleet that is balanced across the Army Components and provides a modernized capability through effective sustainment and enhancement of the HMMWV fleet complemented with newly fielded JLTVs. This will ensure the Army's requirements for the LTV fleet are achieved and maintained by this future mixed fleet of HMMWV and JLTV vehicles.

Towards these end states, the main effort for new procurement remains the JLTV program. The JLTV program continues to meet cost, schedule and performance requirements and is on track for a Milestone B decision in 1QFY12.

The intent is to rapidly divest older HMMWVs and use RECAP to sustain the current HMMWV fleet while the JLTVs come online and begin fielding sometime in the FY17 timeframe. Effective scheduling and coordination across PM's will ensure the Army's requirements for the LTV fleet are achieved and maintained throughout this transition.

The combination of HMMWV divestiture and HMMWV RECAP combined with new JLTV procurement will reduce fleet age while providing improvements in performance and protection. The amount the fleet age drops due to divestitures depends on the variants selected. For example if the Army was to divest 10,000 HMMWVs using M966, M1025 and M1026 Series HMMWVs, the overall HMMWV fleet age would drop by half a year (Current average age: 12.3-.5 =11.8 average age of the fleet). A divestiture of 25,000 HMMWVs would reduce the overall HMMWV fleet age by 1.4 years. RECAP, which returns HMMWVs back to zero miles, has the same effect on the fleet's age as procuring new, but at a lower cost. The Army can RECAP 3 Utility HMMWVs for the cost of 1 new UAH.

The Army's preferred approach is to extend the life of the existing HMMWV fleet through recapitalization while investigating options to improve both automotive and protection improvements to make the system available for operational employment overseas.

Currently funded and executed Depot recapitalization initiatives include programs aimed at extending the service life of both utility and UAH variants. The utility RECAP has focused on extending a limited quantity of A0/A1 models into the M1097R1. The UAH RECAP will bring older UAH, or "Armor Capable", variants up to the current production configuration.

In addition, the Army is planning a competitive approach to HMMWV RECAP that ensures sustainment while providing an opportunity to integrate automotive improvements and enhanced protection. This approach, if approved by Congress, will leverage industry technology improvements while potentially reducing cost. Such a RECAP program would require an updated requirements document to support the advanced protection levels not currently described in the HMMWV Operational Requirement Document (ORD). This effort is not intended as an alternative to the JLTV program.

## **Medium Tactical Vehicle (MTV) Fleet**

**Fleet Description:** The Army's medium truck fleet consists of legacy 2 ½ and 5 Ton Trucks (M35, M809, and M939 series) and the Family of Medium Tactical Vehicles (FMTV).

FMTV consists of the Army's 2 ½ ton-Light Medium Tactical Vehicle (LMTV) fleet and the 5 ton-Medium Tactical Vehicle (MTV) fleet. The FMTV Program is a Non-Developmental Item (NDI) that integrates commercially based items such as a Caterpillar engine; Allison transmission and Meritor axles into the two fleets (LMTV & MTV) while maintaining approximately an 80% parts commonality. The FMTV Program was initiated based on the requirements stated in the Joint Service Operational Requirement (JSOR) dated 01 Nov 1998. There are currently seventeen truck variants in the LMTV and MTV payload class, to include the 10-Ton Dump Truck, the High

Mobility Artillery Rocket System (HIMARS), and Medium Extended Air Defense System (MEADS) to name a few.

**Fleet Status:** As of the end of April 2010, the medium fleet consisted of 28,000 legacy vehicles and 44,000 FMTV vehicles. The FY17 Requirement for the FMTV program is 75,724 trucks. The investment in new FMTV production vehicles follows the guidance provided in The Army's TWV Investment Strategy dated 30 Oct 2009.

**Fleet Acquisition Strategy:** The acquisition strategy for medium trucks is simple and straightforward. The Army intends to replace all of its legacy M35 series 2 ½ ton trucks; M809 series 5 ton trucks and the M939 series 5 ton trucks with FMTVs. The M35 fleet has been targeted for complete divestiture by the end of FY11; the M809 fleet has been projected for completion of divestiture by FY15 and the M939 fleet will complete divestiture no later than FY22. This divestiture reduces operation and support costs, displaces vehicles which cannot be armored and results in a more reliable fleet.

The FMTV program is executed as a series of five-year requirements contracts against a government-owned technical data package (TDP), most recently award to Oshkosh for FY10-14. The Army can obligate funding on its current requirements contract through FY13. In the FY13 timeframe, the Army will need to reach a decision regarding whether another production contract will be required to fulfill the demand for MTV vehicles. Other options that also must be considered include Repair (Sustainment) and RECAP of FMTV vehicles. The Repair (Sustainment) program repairs equipment to 10/20 standard but does not increase the performance capability of the vehicle. To date the Army has Reset to this 10/20 standard over 1000 FMTVs through its Repair (Sustainment) efforts.

RECAP (upgrade) for FMTV from earlier model configurations (A0, A1 or A1R) to the current configuration (A1P2) is not expected, at least during the period of the current requirements contract. Initial analysis on parts and labor needed to execute such a RECAP program is estimated at greater than the cost of new vehicle production. The Army will continue to reevaluate its RECAP verses new procurement decisions as part of the annual TWV Capability Portfolio Reviews.

The Desired end state for the FMTV FoV by the end of FY15 is to have all the M35s/M800s divested out of the Army inventory. The average fleet age by 2015 is estimated to be approximately 11 years. The goal by the end of 2025 is for the Army to have fully divested all legacy vehicles from the fleet leaving FMTV variants to fill the Army requirement. In addition, 33% of the FMTV fleet will have full LTAS (B-Kit) capabilities.

## **Heavy Tactical Vehicle (HTV) Fleet**

**Fleet Description:** The Army's HTV fleet consists of the Heavy Expanded Mobility Tactical Truck (HEMTT) FoV, the Heavy Equipment Transporter (HETS), Palletized Load System (PLS) FoV, M915-series FoV, and associated trailers and support

systems. It also includes legacy versions of these trucks as well as the M917 Heavy Dump Truck that are no longer in active procurement and will not be replaced within the period of the POM.

**Fleet Status/Acquisition Strategy:** The Army's 2009 TWV Investment Strategy calls for the HTV fleet investment to focus on modernizing the oldest variants to the current armor-capable configurations while reducing sustainment costs by divesting certain older variants of vehicles and trailers, as new production is fielded. Because of the diversity of the HTV fleet the fleet status and acquisition strategy is best presented separately for the major systems which comprise the fleet.

The majority of the Army's HTV fleet, with the exception of the M915 FoV, is procured through a sole source contract with Oshkosh Truck Co. that supports planned procurement through FY11 funding. The Army does not own a TDP for trucks in the HTV fleet and would have to procure one from Oshkosh in order to enable competitive production of current truck models. The Army is currently evaluating contracting and acquisition strategies for build-to-print or performance specification based competition for procurement and RECAP beyond FY11.

**Heavy Expanded Mobility Tactical Truck (HEMTT) FoV:** The FY17 requirement for the HEMTT FoV is 22,712 vehicles. Currently, 53% of the FY17 requirement for HEMTTs consists of the older variants A0/A2, which do not have the LTPS characteristics integrated into the production design. In accordance with the TWV Investment Strategy, the Army's fleet investment strategy for this system will focus on new procurement (thru FY17) of those models that are short of Army requirements. HEMTT Recapitalization efforts will work towards extending service life; bring older variants to a modern armor ready configuration to support the LTPS; and balance model mix requirements where feasible. At present, the average age of the fleet is 17 years and only has 2,430 B-Kits for the current fleet of A4 variants (7,900 procured through FY09).

The desired end state for the HEMTT by the end of FY15 is to procure the remainder of the Army's requirement leaving a mixed fleet of capabilities with an average age of 14.9 years. Additionally growth in B-Kit /LTPS will continue while older Models are recapitalized to an A4 configuration. By 2025 the Army will achieve not only 100% fill of the requirement, but will have a fleet that consists of all "Armor Ready" HEMTTA4s to support ARFORGEN requirements.

**Heavy Equipment Transporter (HETS):** The Heavy Equipment Transporter System (HETS) transports tanks and other heavy tracked and wheeled vehicles to and from the battlefield. The HETS consists of the M-1070 truck tractor and M-1000 semi-trailer that is designed to transport, deploy, and evacuate 70-ton payloads. The HETS first entered Army service in 1993. The Army has achieved 100% of its FY17 requirement (2,361) but all of the fielded M1070 vehicles are of the legacy A0 variant, which currently operate in an overload condition resulting from AoA protection on vehicles that were not designed to accommodate the additional weight. In accordance with the Army's TWV

Investment Strategy, the Army plans to award a contract (Jul 10) to procure new HET A1 tractors, which is designed to carry the additional weight required under the LTPS protection level. New production M1070A1 tractors and M1000 trailers will replace fielded vehicles since the fleet requirements have been met, requiring divestiture of M1070 and M1000 fleet assets. Recapitalizing the HET A0 variants to an A1 configuration is not economically feasible since 98% of the parts needed would have to be new. The desired end state for the HET by the end of FY12 is to complete the procurement of the A1 and reduce the fleet's variant mixture as well as its average age. The average fleet age by 2015 is estimated to be approximately 12 years. By 2025, the HET Fleet is projected to procure 80-85% (goal is 100%) of the Army requirement consist of A1 variants that support LTPS armor requirements, with the required quantities of LTPS compliant B-Kits, and reduce the average age of the fleet.

**Palletized Load System (PLS) FoV:** The PLS is composed of a prime mover truck with integral self loading and unloading transport capability, a 16.5-ton payload PLS-trailer, and demountable cargo beds (Container Roll On/Off Platform (CROPS) / Flat racks). The PLS is a key transportation component in support of long-range and local hauling missions to include unit resupply of ammunition. The PLSA1 provides significant safety, performance, and survivability improvements over the basic PLSA0. An anti-lock brake system, independent front suspension for improved handling, and a 55 additional horsepower road engine highlight some of the major improvements. In addition the PLSA1 shares a common cab with the HEMTT FoVs and will accept the same LTPS armor. In accordance with the TWV Investment Strategy, the Army's fleet investment strategy for this system will focus on new procurement (thru FY11) of those models that are short of the Army requirements. The Army has achieved 90% of its FY17 requirement (6,126). PLS Recapitalization efforts will work towards extending service life and bring older variants to a modern armor ready configuration to support the LTPS. The desired end state for the PLS by the end of FY12 is to complete the procurement of the A1 variant; however a mixed fleet of capabilities will still remain. The average fleet age by 2015 is estimated to be approximately seven years. Additionally growth in B kit/LTPS will continue while older models are recapitalized to A1 configuration. By 2025, 80-85% (goal is 100%), of the PLS requirement is projected to be filled with the A1 or newer configuration, with the required quantities of LTPS compliant B-Kits on hand.

**M915-series FoV or Line Haul:** The Line-Haul Tractor FoV is used primarily in active and reserve component transportation units for the rapid and efficient transport of bulk supplies on primary and secondary roads. The FoV consists of the M915 Line Haul Tractor, M917 Dump Truck, and M920 variants. It first entered Army inventories in 1979. Currently, approximately 38 percent of the M915 fleet is beyond their EUL of 20 years. As a result, the Army has experienced a significant increase in sustainment costs to maintain the FoV. The Army has achieved 100% of its FY17 requirement (6,488) and is in the process of divesting these older vehicles.

The M915A5 provides significant safety, performance, and survivability improvements over the previous M915 models. In addition the M915A5 will accept B-Kit armor. In

accordance with the TWV Investment Strategy, the Army's fleet investment strategy for this system will focus on new procurement (thru FY11) for the M915A5, which is on contract with Freightliner. The current production of the M915A5 and on-hand inventories of the M915A3 affords the Army the opportunity to divest all older line haul variants (A0, A1, and A4 Glider Fleet, estimated total of 2,412 trucks). Decisions will need to be made in FY16 and FY18 regarding new competitive Heavy Dump Truck and Line Haul Replacement Tractor procurements. In the case of the Heavy Dump Truck, a Capabilities Production Document (CPD) must be approved in order to address this aging fleet. Currently 24 percent (approximately 263) of the M917 20-Ton Dump Truck Fleet is beyond its EUL of 20 years.

The desired end state for the M915 series fleet by the end of FY15 will be a fleet consisting of M915A3 and M915A5. The average fleet age by 2015 is estimated to be approximately 11 years. The M915A0, A1, A2 and A4 will be removed from the fleet through the divestment strategy currently in draft by DA G8. By 2025, the M915 Fleet is projected to procure 80-85% (goal is 100%) of the Army requirement that consist of A5s and support LTPS armor requirements and the required quantities of LTPS compliant B-Kits will be on hand.

## **Mine Resistant Ambush Protected (MRAP) Vehicles**

**Fleet Description:** The Secretary of Defense designated the Joint Mine Resistant Ambush Protected (JMRAP) program as the Department of Defense's highest priority acquisition program, with the Navy/USMC as lead Service. The production capacity of multiple vendors employing Non-Developmental Item (NDI) systems has been leveraged to meet the program's overarching objective of producing and fielding the maximum number of survivable, safe, and sustainable MRAP vehicles in the shortest period of time. From 2006 to the end of 2010, over 25,000 MRAP FoVs will have been produced for all Services (19,000+ for the Army) at a cost of over \$40B using Overseas Contingency Operations funds. Vehicles were procured under 17 Low-Rate Initial Production (LRIP) procurements based on the following evolving requirements focus: 1) LRIP 1-9 variants focused on underbody survivability, 2) LRIP 10-11 variants focused on Explosively Formed Penetrator (EFP) survivability, and 3) LRIP 12-17 focused on enhanced mobility.

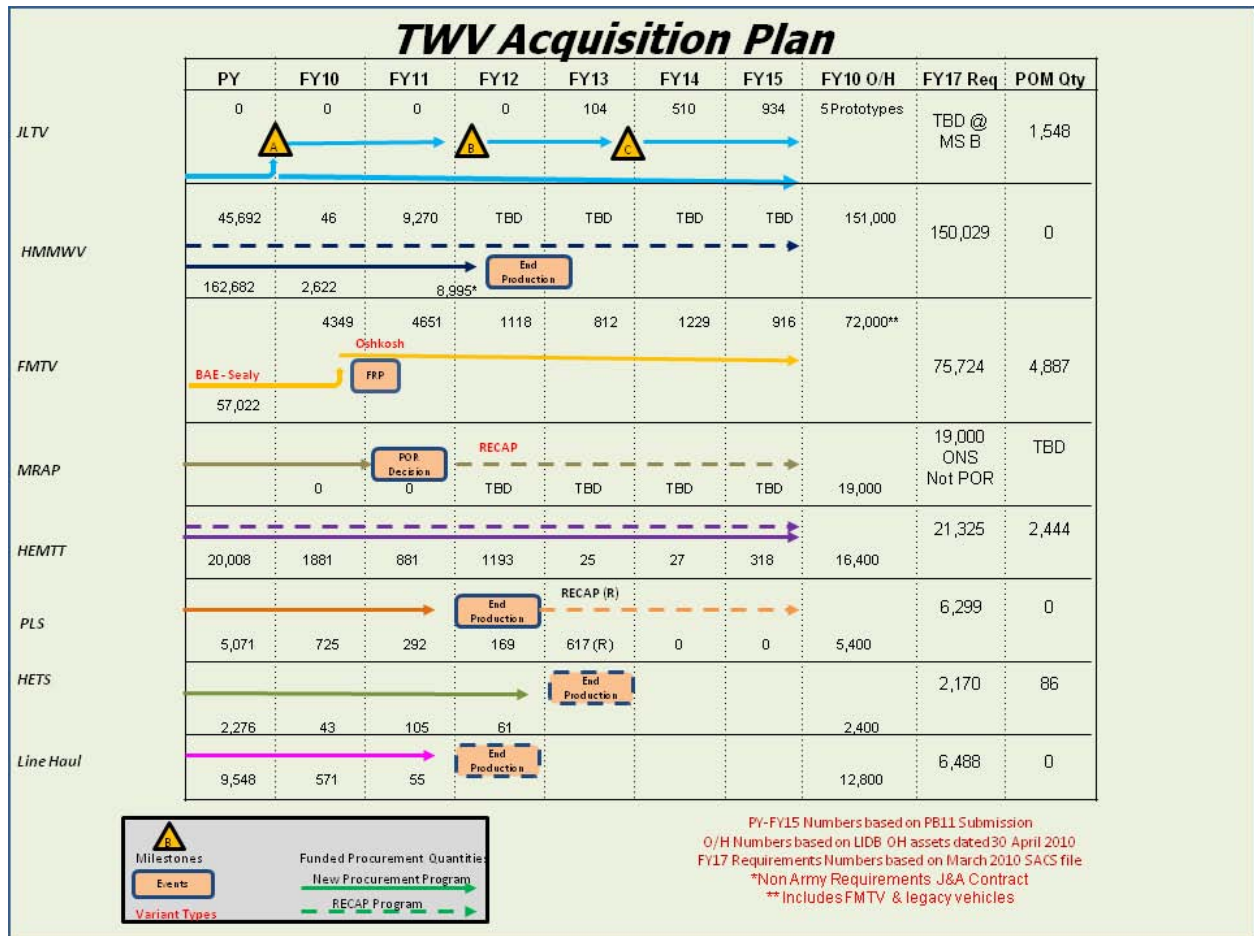
**Fleet Status:** Services are reviewing options to determine MRAP FoV requirements for their post-conflict enduring forces. The Army is considering a plan to allocate over 9,000 vehicles in 20 task-organized Brigade Combat Team sets stored in Army Pre-Positioned Stocks (APS) and CONUS storage facilities, plus approximately 6,000 vehicles in Modification Table of Organization and Equipment (MTOE) units, training, sustainment, and war reserve stocks. As part of this planning process, the Army will also consider the best mix of MRAP FoV variants given variant capabilities, limitations, common logistics, survivability, etc. The Army will also ensure vehicles complete the type classification standard and full materiel release process to document and provide data for authorization, procurement, logistical support, asset visibility, maintenance, and readiness reporting as required for all standard Army acquisition programs of record.



**Fleet Acquisition Strategy:** The Army will use a variety of tools to shape its MRAP enduring force mix, to include recapitalization and divestiture. As part of recapitalization, the Army will consider options to upgrade vehicles returning from theater to meet minimum Capability Production Document (CPD) Key Performance Parameters (KPPs) in a cost-efficient manner. The Army will divest variants that are deemed too costly to upgrade to minimum CPD standards or to support multiple/complex component configurations across multiple variants. Effective divestiture will result in a rebalanced MRAP fleet that maximizes capability while minimizing life cycle sustainment costs. These and other tools will ensure the Army leverages previous significant MRAP investments to continue to provide Soldiers with the most capable, survivable, and cost-effective MRAP vehicles available.

# CONCLUSION

There are many uncertainties that the future holds, but for the foreseeable future the Army will be in an age of persistent conflict. The Army will continue to adjust this strategy and the TWV fleet by using a combination of new procurement, recapitalization, repair (sustainment) and divestiture to meet Army requirements (see below). The goal is to provide the best fleet mix and quality possible to meet the Army's needs within the resources available.



**Figure 4. (TWV Fleet Plan)**

Our strategic objective is to have a flexible strategy with the ability to adapt to change and mitigate the risk of uncertainty caused by an evolving threat, change to our force structure to meet our missions, and/or changes in the economy that impact the Army budget, acquisition and sustainment programs. The Army's Acquisition Strategy incorporates fleet management processes that track fleet metrics and uses that information to enable competition and partnering, sustain capabilities, and is agile

enough to shift resources in order to effectively manage uncertainty and promote fiscal stability across the fleet. Our aim is to set the conditions now in order for the TWV Acquisition and Sustainment community to be poised to rapidly and effectively respond to future challenges.

## ACRONYM LIST

AAO	Army Acquisition Objective
AC	Active Component
AoA	Add-on Armor
APS	Army Pre-positioned Stocks
ARCIC	Army Capabilities Integration Center
ARFORGEN	Army Force Generation
ASARC	Army Systems Acquisition Review Council
BCT	Brigade Combat Team
C4I	Command, Control, Communications, Computers & Intelligence
CAPE	Cost Assessment and Program Evaluation
CASCOM	Combined Arms Support Command
CDD	Capability Development Document
CDT	Common Driver Trainer
COA	Course of Action
CPD	Capability Production Document
CROP	Containerized Roll-in/Out Platform
CTR	Continuous Technology Refreshments
ECV	Expanded Capability Vehicle
EUL	Economic Useful Life
FMTV	Family of Medium Tactical Vehicles
FOB	Forward Operating Base
FoV	Family of Vehicles
G-3	Army Deputy Chief of Staff, G-3 (Operations, Readiness, Mobilization)
G-4	Army Deputy Chief of Staff, G-4 (Logistics)
G-8	Army Deputy Chief of Staff, G-8 (Programs)
GWOT	Global War on Terrorism
HEMAT	Heavy Expanded Mobility Ammunition Trailer
HEMTT	Heavy Expanded Mobility Tactical Truck
HET	Heavy Equipment Transporter
HETS	Heavy Equipment Transporter System (tractor and trailer)
HIMARS	High Mobility Artillery Rocket System
HMMWV	High Mobility Multi-purpose Wheeled Vehicle

HTV	Heavy Tactical Vehicles
IED	Improvised Explosive Device
JLTV	Joint Light Tactical Vehicle
JROCM	Joint Requirements Oversight Council Memorandum
KPP	Key Performance Parameter
LHS	Load Handling System
LMTV	Light Medium Tactical Vehicle
LSAC	Low Signature Armored Cab
LTAS	Long-term Armor Strategy
LTPS	Long Term Protection Strategy
LTV	Light Tactical Vehicle
MEADS	Medium Extended Air Defense System
MRAP	Mine Resistant Ambush Protected
MSR	Minimum Sustainment Rate
MTV	Medium Tactical Vehicles
O&S	Operations & Support
OCO	Overseas Contingency Operations
OEF	Operation Enduring Freedom (Afghanistan)
OEM	Original Equipment Manufacturer
OIF	Operation Iraqi Freedom
OMA	Operation and Maintenance, Army (appropriation)
OPTEMPO	Operational Tempo (unit activity level)
ORD	Operational Requirements Document
PEO CS&CSS	Program Executive Office, Combat Support & Combat Service Support
PLS	Palletized Loading System
PLS-T	Palletized Loading System Trailer
PM	Product Manger
PM -TV	Project Manager-Tactical Vehicles
POM	Program Objective Memorandum
RACK	Radian Armor Crew Kit
RDECOM	Research, Development and Engineering Command
RDT&E	Research, Development, Test & Evaluation
RECAP	Recapitalization
SBCT	Stryker Brigade Combat Team
TACOM	U.S. Army Tank-automotive and Armaments Command

TDP	Technical Data Package
TPE	Theater Provided Equipment
TRADOC	U.S. Army Training and Doctrine Command
TWV	Tactical Wheeled Vehicle
UAH	Up-Armored HMMWV
USAODS	U.S. Army Operator Driving Simulation
USMC	U.S. Marine Corps

## DEFINITION OF TERMS

**Army Acquisition Objective (AAO)** - The quantity of vehicles or equipment required to equip the US Army approved force and to sustain that force, together with specified allies, in wartime from D-Day through the period prescribed and at the support level directed in the latest Office of the Secretary of the Defense Consolidated Guidance.

**Army Force Generation (ARFORGEN)** - Is the structured progression of increased unit readiness over time resulting in recurring periods of availability of trained, ready, and cohesive units. These units are prepared for operational deployment in support of Combatant Commanders' or civil authorities' requirements. Units are task organized in modular expeditionary forces, tailored for mission requirements. Operational requirements drive the ARFORGEN training and readiness process. These same requirements support the prioritization and synchronization of resourcing, recruiting, organizing, manning, equipping, training, sustaining, sourcing, mobilizing, and deploying cohesive units more effectively and efficiently. This rotational model, which maximizes total force utilization, replaces the Army's linear, tiered readiness strategic construct for force generation. The Army builds the readiness of units as they move through three force pools: Reset; Train-Ready; and Available

1. RESET - The unit's focus is on reintegrating Soldiers and Families and completing individual education, development, and institutional training. During this time the institutional Army focuses on manning and equipping the unit so it can conduct collective training.
2. Train-Ready - Unit's focus is on restoring proficiency through unit training, with the unit leaving this force pool upon completing a culminating collective training event (CTE). This CTE ensures the unit achieves the capability as defined by operational requirements.
3. Available - A unit may be a Deployed Expeditionary Force (DEF) with a "deployed mission" or a Contingency Expeditionary Force (CEF) with a mission to accrue full spectrum capabilities in order to react to a global contingency. Contingency Expeditionary Forces are also available to participate in Combatant Commander training exercises and Theater Security Cooperation events around the globe based on mission demand.

*2011 objective BOG:Dwell 1:2 AC/ 1:4 RC*

**Army Prepositioned Stocks (APS)** - Strategically prepositioning vital war equipment and supply stocks afloat and ashore worldwide that reduce the deployment response times of the modular expeditionary Army. All APS stocks are configured as standard brigade combat teams equipping early-arriving combat forces with matching APS equipment. There are five APS sets: APS-1 (CONUS), APS-2 (Europe), APS-3 (Afloat), APS-4 (Northeast Asia), APS-5 (Southwest Asia).

**Base Table of Organization and Equipment (BTOE)** - The BTOE is the least modernized version of the TOE. An organization design based on doctrine and equipment currently available. It is the lowest common denominator of modernization and identifies the mission essential wartime requirements for personnel and equipment based upon equipment common to all units of a given type organization. The BTOE includes only those items that have been designated by USAFMSA and approved by the ADCSOPS-FD as BTOE equipment.

**Combat vehicle** - A vehicle, with or without armor, designed for a specific fighting function, such as a main battle tank or infantry fighting vehicles. Armor protection or armament mounted as supplemental equipment on noncombat vehicles will not change the classification of such vehicles to combat vehicles.

**Commercial vehicle** - A vehicle that has evolved in the commercial market to meet civilian requirements and which is selected from existing production lines for military use.

**Convoy** - A group of vehicles organized for the purpose of control and orderly movement with or without escort protection that moves over the same route at the same time and under one commander.

**Convoy Protection** – All Actions taken to preserve the effectiveness, survivability, and protection of military and nonmilitary personnel and equipment to ensure the convoy is able to accomplish its mission. May include some or all of the following: Doctrine, Training, Tactics, Techniques, Procedures, and appropriate equipment.

**Long Term Armoring Strategy (LTAS)** – This strategy developed three overarching ideas: provide scalable protection by using the A cab/B-Kit concept; provide 42% of the TWV fleet with B kits; and protect TWVs by using armor.

**Left-Behind Equipment (LBE)** – Is equipment that is left at home station after a unit deploys. Property on the unit's organization property book not required for deployment is a candidate for LBE. LBE is accounted for and sustained at home station until the unit returns or is redistributed in support of HQDA G-8 equipping priorities or as otherwise directed by the Army Command (FORSCOM) or CONUS Direct Reporting Unit (DRU).

**Long Term Protection Strategy (LTPS)** - This strategy defines the ends, ways, and means used to achieve protected mobility for crews and occupants of Tactical Wheeled Vehicles. The desired end-state is to provide the warfighter with protection and survivability capabilities with both armor and non-armor solutions to conduct missions across the full spectrum of operations.

**Military designed vehicle** - A vehicle having military characteristics resulting from military research and development processes, designed primarily for use by forces in the field in direct connection with, or support of, combat or tactical operations.



**Modernization** – Is the rebalancing of forces and integrating capabilities necessary to ensure future success across the range of operations, from peacetime engagement to major combat operations The Army will modernize its TWV fleet through the reset process; repair, replace, and recapitalize

**Modification Table of Organization and Equipment (MTOE)** - An authorization document that prescribes the modification of a basic TOE necessary to adapt it to the needs of a specific unit or type of unit. Required strength in a modification table of organization and equipment (MTOE) represents the full war time requirement. Readiness impact MTOEs only.

**Objective table of organization and equipment (OTOE)** - The OTOE portrays a fully modernized unit's structure and composition upon application of all ICPs. A fully modernized, doctrinally sound organizational design that sets the goal for planning and programming of the Army's force structure and supporting acquisition systems primarily in the last year of the program objective memorandum and the extended planning annex

**Pre-Deployment Training Equipment (PDTE)** - Is to provide training assets to mobilizing and/or deploying units to use prior to deployment in order to provide realistic training with the type of equipment they will use in theater.

**Protection (Force Protection)** – Are those attributes that contribute to the protection of personnel by preventing or mitigating hostile actions against friendly personnel, military and civilian. This may include the same attributes as those that contribute to survivability, but the emphasis is on protecting the system operator or other personnel rather than protecting the system itself. Attributes that are offensive in nature and primarily intended to defeat enemy forces before they can engage friendly forces are not considered force protection attributes. Attributes that protect against accidents, weather, natural environmental hazards, or disease (except when related to a biological attack) are also not part of force protection.

**Reset** - Is the actions taken to restore equipment to desired level of combat capability commensurate with a unit's future mission. Reset reverses the effects of combat stress and delayed desert damage on equipment and includes repair, recapitalization, and replacement of equipment.

1. **Repairs** can be made at the field level or sustainment level:
  - a. **Repair (Field)** - field level maintenance is intended to bring equipment back to the 10/20 series Technical Manual standard while maintaining current configuration. It is generally done by Soldiers, sometimes augmented by Department of the Army civilians and/or contractors, as required, and is usually performed at installations where the equipment is stationed.
  - b. **Repair (Sustainment)** - accomplishes that portion of the maintenance mission that is beyond the capability or capacity of the field-level

environment; performed under the management of the Army Material Command, at Depot or regional repair facility.

2. **Recapitalization (RECAP)** The rebuild or selected upgrade of currently fielded systems to ensure operational readiness and a zero time, zero miles system. This includes rebuilding of equipment which could include: extending service life, reducing operating and support costs, enhancing capability by adding new technological features, and improving system reliability. The Army recapitalizes equipment either at Army Materiel Command depots or arsenals, the original equipment manufacturer, or a partnership of the two. (Upgrades are OPA and Rebuild are OMA Dollars)
3. **Replacement** includes buying new equipment to replace confirmed battle losses, washouts, obsolete equipment, and critical equipment deployed and left in theater but needed by reserve components for homeland defense/homeland security missions. (OPA Dollars)

The Army's standard level of maintenance is known as 10/20. This standard requires that all routine maintenance be executed and all deficiencies be repaired. Equipment at less than the 10/20 standard can be fully mission capable, which means there are no critical maintenance deficiencies as outlined in the technical manuals and instructions, and no safety deficiencies. Unit commanders have the authority to supersede the technical manuals and declare a system fully mission capable even though it has a non-mission capable deficiency.

**Strategy** - A coordinated time phased long term plan of action with decision points designed to achieve a particular goal.

**Survivability** - Survivability attributes are those that contribute to the survivability of a TWV system. This includes attributes such as speed, maneuverability, detectability, and countermeasures that reduce a system's likelihood of being engaged by hostile fire, as well as attributes such as armor and redundancy or critical components that reduce the system's vulnerability if it is hit by hostile fire.

**Theater Provided Equipment (TPE)** – Defined (within the Army) as either:

1. Equipment that is purchased and remains in theater for issue to units as they rotate or,
2. Equipment that deployed with units and is left behind for use by follow-on forces.

**Tactical Wheeled Vehicle (TWV)** - Multipurpose or special purpose military wheeled platforms which transport personnel and all classes of supply, to include equipment and dry or liquid cargo. They perform general or specific missions, and support all warfighting functions (Movement and Maneuver, Intelligence, Fires, Sustainment, Command and Control, and Protection). They are specially designed vehicles, or commercial vehicles modified to meet certain military requirements, and are capable of

safely operating on primary and secondary roads at highway speeds. They are capable of operating off-road; the degree of off-road mobility varies. TWV include both powered and unpowered (trailer) systems. There are three general weight categories of TWV, essentially based on highway payload;

1. Light (payload >2.5 tons) Light vehicles also have a rotary wing air transportability requirement.
2. Medium (payload of <2.5 to 10 tons)
3. Heavy (payloads < 10 tons).

TWV may serve as the prime mover of specific weapon systems, e.g., TOW missile carrier, high-mobility artillery rocket system (HIMARS), etc.

**TWV Investment Strategy** – This strategy is designed to provide specific fleet investment guidance to key agencies, which will serve as the basis for procurement and sustainment processes. It represents the Army position and will remain as the definitive document on which all fleet investment, integration, and management decisions will be based unless superseded by updates from the Department of the Army

### Armor Specific References

**Armored** – A vehicle by design that has a built-in level of protection that cannot be removed but may except additional add on armor. (MRAP Family of vehicles)

**Armor Capable** – A vehicle designed to except armor. Vehicle structural equipped with mounting hardware to accept add on armor and provide a specified level of protection.

**Non-armor capable** – Vehicle does not conform to A-Cab/B-Kit concept. Base vehicle needs structural modifications and mounting provisions added in order to accept Add on Armor (AoA) kit. A vehicle not designed to accept armor or when armor is applied will lose critical operational and or performance capabilities

**A-Cab** – A vehicle through procurement or recap having all necessary structural improvements, mounting hardware for add on armor and non-armor components, and hard to install armor sections (i.e. floor plates and firewalls) that allow for a TWV to be ready to accept the B-Kit.

**B-Kit** - Scalable components that provide a desired level of protection. Kits will encompass any solution (armor and non-armor) or combination of solutions that meet protection requirements for TWV. Specific components of B- kits may vary by vehicle type.

**Scalable armor** – Armor packages that can be applied and removed from vehicles. *(Can be both armor capable or armored vehicles)*