United States Government Accountability Office

GAO

Report to Congressional Committees

November 2010

DEFENSE ACQUISITIONS

Issues to Be Considered as DOD Modernizes Its Fleet of Tactical Wheeled Vehicles

GAO-11-83

November 2010

DEFENSE ACQUISITIONS

Issues to Be Considered as DOD Modernizes Its Fleet of Tactical Wheeled Vehicles

GAO Accountability • Integrity • Reliability

Highlights

Highlights of GAO-11-83, a report to congressional committees

Why GAO Did This Study

The Department of Defense (DOD) is acquiring two new tactical wheeled vehicles (TWV): the Mine Resistant Ambush Protected (MRAP) All Terrain Vehicle (M-ATV) and the Joint Light Tactical Vehicle (JLTV). The $12.5 billion M-ATV is for use in Afghanistan; JLTV is the future replacement for vehicles like the High Mobility Multi-purpose Wheeled Vehicle (HMMWV).

GAO was asked to assess (1) DOD's progress in rapidly acquiring and fielding M-ATVs, (2) JLTV's expected features and cost compared to other TWV, and (3) the extent to which the current plans for M-ATV and JLTV are consistent with the services' TWV investment strategies.

GAO reviewed documents and held discussions with key officials to determine program strategies, costs, performance, and anticipated features; and compared M-ATV and JLTV plans with service strategies.

What GAO Recommends

GAO recommends that DOD (1) ensure that the JLTV program clearly demonstrates a match between requirements and resources; (2) stage the timing of the DOD-wide TWV strategy so that it captures key knowledge; and (3) include in the strategy a cost-benefit analysis that could minimize the collective acquisition and support costs of the various TWV programs, and reduce the risk of unplanned overlap or duplication. DOD concurred with our recommendations.

View GAO-11-83 or key components. For more information, contact Michael J. Sullivan at (202) 512-4841 or sullivanm@gao.gov.

What GAO Found

The M-ATV program has been successful, delivering well-performing vehicles ahead of schedule at an estimated cost of $12.5 billion. No major issues have been identified in testing and early fielding. In developing the M-ATV acquisition strategy, lessons learned from the acquisition of MRAPs in Iraq were applied. Like the earlier MRAPs, the M-ATVs did not require technology development, a key factor in the program's success. As of late August 2010, 7,488 vehicles had been delivered to the government and 4,379 had been fielded to units in Afghanistan. Fielding is expected to be completed in December 2010. The urgent need for these vehicles resulted in their fielding and testing at the same time; however, source selection testing was conducted, and no vehicles were fielded until their safety was verified.

Jointly managed by the Army and Marine Corps, JLTV is expected to provide protection levels that are comparable to the M-ATV but without loss of payload or automotive performance. JLTV's acquisition costs are yet to be determined but are expected to be substantial. Unit costs could be over $800,000—somewhat less than M-ATV, with mission equipment making up more than half of the costs. Unlike M-ATV and earlier MRAPs, JLTV has demanding projected requirements that necessitate technological and engineering advances. Key challenges are whether the vehicle can provide the performance and reliability required yet stay within the weight limits for helicopter transport. Difficult tradeoffs in requirements may be necessary. At this point, it is a well-structured program with desirable features like a competitive technology development phase. This phase is scheduled to be completed by late fiscal year 2011, when DOD will decide if the program should enter the engineering and manufacturing development phase. That is the point where JLTV should clearly demonstrate that its projected requirements can be met with available resources. Evidence of that match would include a completed preliminary design review and a technology readiness assessment that shows all technologies to be fully mature.

Current plans for M-ATV and JLTV dovetail with the objectives of the most recent Army and Marine Corps investment strategies. The implementation of those strategies, however, will be influenced by (1) the decision to continue producing new HMMWVs, recapitalize the existing HMMWV fleet, or both; (2) long-term funding for MRAP and M-ATV sustainment, and (3) specific cost and capabilities of JLTV. The departmentwide strategy for TWVs that DOD plans to prepare would benefit greatly from the resolution of these issues. To the extent this strategy captures the knowledge gained by the services, the strategy can reconcile the aggregate affordability and other implications of the various tactical wheeled vehicle programs with the competing demands of the department. For example, at this point, the service strategies consider MRAP vehicles to be additive to the force structure, not offsetting quantities of HMMWVs or JLTVs. Any potential offsets between the MRAP vehicles and JLTVs, to the extent they are supported by cost-benefit analyses, could save both acquisition and support costs.

Contents

Abbreviations

DOD	Department of Defense
ECV	Expanded Capability Vehicle
EMD	engineering and manufacturing development
GFE	government-furnished equipment
GVW	gross vehicle weight
HMMWV	High Mobility Multi-purpose Wheeled Vehicle
JLTV	Joint Light Tactical Vehicle
M-ATV	MRAP All Terrain Vehicle
MRAP	Mine Resistant Ambush Protected
TWV	tactical wheeled vehicle
UAH	up-armored HMMWV

GAO
Accountability * Integrity * Reliability

United States Government Accountability Office
Washington, DC 20548

November 5, 2010

The Honorable Adam Smith
Chairman
The Honorable Roscoe Bartlett
Ranking Member
Subcommittee on Air and Land Forces
Committee on Armed Services
House of Representatives

The Honorable Gene Taylor
Chairman
The Honorable Todd Akin
Ranking Member
Subcommittee on Seapower and Expeditionary Forces
Committee on Armed Services
House of Representatives

Ground-based military operations generally use two kinds of vehicles: combat vehicles designed for a specific fighting function and tactical vehicles designed primarily for use by forces in support of tactical operations. Combat vehicles generally move on tracks versus wheels and include the Abrams tank, the Bradley Fighting vehicle, and the Paladin self-propelled howitzer. Tactical vehicles generally move on wheels and include the High Mobility Multi-purpose Wheeled Vehicle (HMMWV), the Mine Resistant Ambush Protected (MRAP) vehicle, and families of trucks and trailers.

The Department of Defense (DOD) is currently in the process of acquiring two new tactical wheeled vehicles (TWV): the MRAP All Terrain Vehicle (M-ATV) and the Joint Light Tactical Vehicle (JLTV). The M-ATV is being acquired in response to an urgent need to support operations in Afghanistan and has an estimated acquisition cost of $12.5 billion. The JLTV is being acquired to begin replacing the aging HMMWV fleet; the JLTV program is currently in the technology development acquisition phase with the engineering and manufacturing development (EMD) phase scheduled to start at the end of fiscal year 2011.

In July 2009, you requested that we assess (1) the current status of DOD's strategy for rapidly acquiring and fielding M-ATVs, including estimated acquisition cost and demonstrated performance; and (2) JLTV's expected features and cost compared to that of other TWVs such as the M-ATV. In

subsequent discussions with your staff, you also requested that we assess (3) the extent to which current plans for M-ATV and JLTV are consistent with the broad objectives and strategies that the Army and Marine Corps have set out in their TWV investment strategies.

To determine DOD's strategy for and progress in rapidly acquiring and fielding the M-ATV, we obtained and reviewed updated program documents and held discussions with system developers, acquisition officials, and contractor representatives. To determine the cost of the M-ATV, we obtained and reviewed cost estimates and held discussions with program officials. To determine the demonstrated performance of the M-ATV, we obtained and reviewed test reports and held discussions with test officials. To determine JLTV's expected features as it moves toward Milestone B in 2011, we obtained and reviewed updated program documents and held discussions with Army and Marine Corps acquisition and test officials. Using Army data, we prepared a table comparing JLTV's expected features and cost with those of the M-ATV and current generation HMMWV. To determine the extent to which current plans for M-ATV and JLTV are consistent with Army and Marine Corps TWV investment strategies, we obtained and reviewed updated strategies and held discussions with Army and Marine Corps officials. More details about our scope and methodology are in appendix I.

We conducted this performance audit from November 2009 to November 2010, in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

The Army, which has over 250,000 TWVs, generally categorizes the vehicles as heavy, medium, and light. Heavy TWVs represent about 10 percent of the Army's TWV fleet and include vehicles like the Heavy Equipment Transporter System, which is used to transport main battle tanks and other heavy equipment. Medium TWVs represent about 40 percent of the Army's TWV fleet and include vehicles for hauling cargo and for launch and support platforms' weapon systems such as the High-Mobility Artillery Rocket System. Light TWVs represent about 50 percent of the Army's TWV fleet and currently consist of the HMMWV family of vehicles, which began production in 1983. The Army's HMMWV program also provides vehicles to satisfy Marine Corps and Air Force requirements.

The HMMWV has gone through various upgrades during its nearly 30-year history and has served as DOD's primary wheeled vehicle for shelter carriers, command and control systems, light cargo and troop carriers, weapons carriers, and ambulances. This report addresses issues related to light tactical vehicles and the M-ATV. The M-ATV is not considered a light vehicle by its weight, but it is being used for functions typically done by light tactical vehicles.

In February 2005, Marine Corps combatant commanders identified an urgent operational need for armored tactical vehicles to increase crew protection and mobility of Marines operating in hazardous fire areas against improvised explosive devices, rocket-propelled grenades, and small arms fire. In response, the Marine Corps identified the solution as the up-armored HMMWV. Over the next 18 months, however, combatant commanders continued to call for more robust mine-protected vehicles. The solution to the requirement was the MRAP family of vehicles.

MRAPs provide warfighters with platforms capable of mitigating the effects of improvised explosive devices, underbody mines, and small arms fire threats, which are currently the greatest casualty producers overseas. The MRAP family of vehicles consists of four categories: Category I for urban combat missions; Category II for convoy escort, troop transport, explosive ordinance disposal, and ambulance missions; Category III for clearing mines and improvised explosive devices; and the M-ATV for small-unit combat and tactical operations in complex and highly restricted rural, mountainous, and urban areas.[1] The current M-ATV requirement is to rapidly acquire 8,104 vehicles for use primarily in Afghanistan. Delivery orders for production were awarded to a single contractor, Oshkosh Defense. Like the Category I, II, and III variants, vehicles are prepared to accommodate government-furnished equipment during production at Oshkosh with government-furnished equipment integrated at the Space and Naval Warfare Systems Command.

In 2007, the Army reported that there were approximately 120,000 HMMWVs in use by the services. The Army also reported that the need for additional armor for current operations, among other things, had pushed the use of the HMMWV far beyond its original purpose and

[1]For a more detailed description of Category I, II, and III vehicles, see GAO, *Rapid Acquisition of Mine Resistant Ambush Protected Vehicles*, GAO-08-884R (Washington, D.C.: July 15, 2008).

capabilities. The effect of this employment, according to the Army, led to an imbalance in protection, payload, and performance; specifically,

- protection: light vehicles required the adoption of supplemental armor;
- payload: the supplemental armor reduced the vehicles' useable payload (including warfighters, mission equipment, and cargo); and
- performance: the supplemental armor degraded mobility, reliability, and maintainability, decreased fuel efficiency, decreased vehicle stability and safety, and decreased operational availability.

The objective of the JLTV program is to address the HMMWV fleet's protection, payload, and performance imbalance within a transportable vehicle. JLTV is expected to provide comparable protection to the MRAP vehicles in most cases—the major exception being underbody protection—but with better payload and performance.

To guide the future investment decisions related to JLTV and the M-ATV, as well as other TWVs, the Army and Marine Corps have prepared investment strategies, which enable the services to synchronize their respective TWV programs to maximize the use of limited funding. The Army's most recent strategy was prepared in October 2009 and will be updated later this year. The Marine Corps prepared a TWV strategy in August 2008; an updated strategy is scheduled for release the end of this year. In 2008, the Army and Marine Corps also prepared a joint TWV investment strategy at the request of the Office of Management and Budget. DOD is also committed to preparing a comprehensive and unified strategy and implementation plan for making sound investment decisions for TWVs.

In 2007, at the request of the Subcommittees, we were asked to assess the extent to which DOD had developed a DOD-wide TWV investment strategy. We found that DOD did not have such a strategy. To improve DOD's ability to plan for and manage the development, production, and sustainment of TWVs across the department, we recommended[2] that the Secretary of Defense develop a DOD-wide strategy and implementation plan for making sound investment decisions for TWVs. DOD concurred with our recommendation, stating the following.

[2]GAO, *Defense Acquisitions: Department of Defense Needs a Unified Strategy for Balancing Investments in Tactical Wheeled Vehicles*, GAO-09-968R (Washington, D.C.: Sept. 28, 2009).

- Upon completion of the ongoing TWV studies by the Army and Marine Corps, and the Analysis of Alternatives for Joint Light Tactical Vehicles, DOD will unite these efforts into a comprehensive strategy that dovetails with the services' equipping strategies.
- DOD will endeavor to align requirements, resources, and acquisition strategies into a unified plan for TWV investment decisions.

DOD's Rapid Acquisition of M-ATVs Is Ahead of Schedule and No Major Performance Issues Have Been Identified to Date

DOD has acquired and fielded the M-ATV as quickly as possible in response to an urgent need. This acquisition was successful on a number of fronts. Multiple vendors responded to the urgency; in June 2009 the government awarded the first production delivery order to a single manufacturer—Oshkosh Defense—and the contractor has consistently delivered vehicles well ahead of schedule. The cost to acquire and field 8,104 M-ATVs is now estimated to be $12.5 billion. As it did for MRAP, DOD chose to begin fielding the M-ATV before it had completed developmental and operational testing due to the urgency of the requirement. Before fielding began in December 2009, however, ballistic testing did establish that the vehicles met the requirements for crew protection and vehicle survivability and automotive testing confirmed that the vehicles were generally safe to operate. No major issues have been identified in subsequent testing and the vehicles appear to be performing well in their operational environments.

DOD's Acquisition Strategy Enabled Rapid Fielding

DOD expedited many M-ATV acquisition decisions because of the urgent nature of the requirement. In September 2008, combatant commanders identified a need for a lighter and more agile version of the MRAP—one that offered at least the same protection as the MRAP but was better suited to the conditions in Afghanistan. In quick succession, the Joint Staff approved the requirement; the Under Secretary of Defense for Acquisition, Technology, and Logistics directed the Navy to procure and test vehicles against the requirement; and the Army released a request for proposal. In early 2009, the Army examined proposals, armor samples, and production representative vehicles and in April awarded fixed-price, indefinite delivery, indefinite quantity contracts to five manufacturers for three additional vehicles for mobility and ballistic testing.

In seeking sources for the vehicles, the government placed a strong emphasis on a desire for mature, nondevelopmental vehicles and contractor support for an accelerated program schedule—one of the lessons learned from the MRAP acquisition—according to the program manager. Fully functional prototypes had to be available quickly for test

and evaluation. Of the evaluation criteria for awarding a contract, delivery schedule and production capability were second only to the technical performance requirement to provide MRAP-like protection. The first vehicles to be delivered were designated for testing that was necessary to ensure that vehicles were safe to operate before being operated by users. The next priority was to begin delivering vehicles for home station training, which was necessary before the vehicles could be fielded to users. Delivery of vehicles for theater use began shortly after and took place concurrently with delivery and fielding of vehicles for home station training.

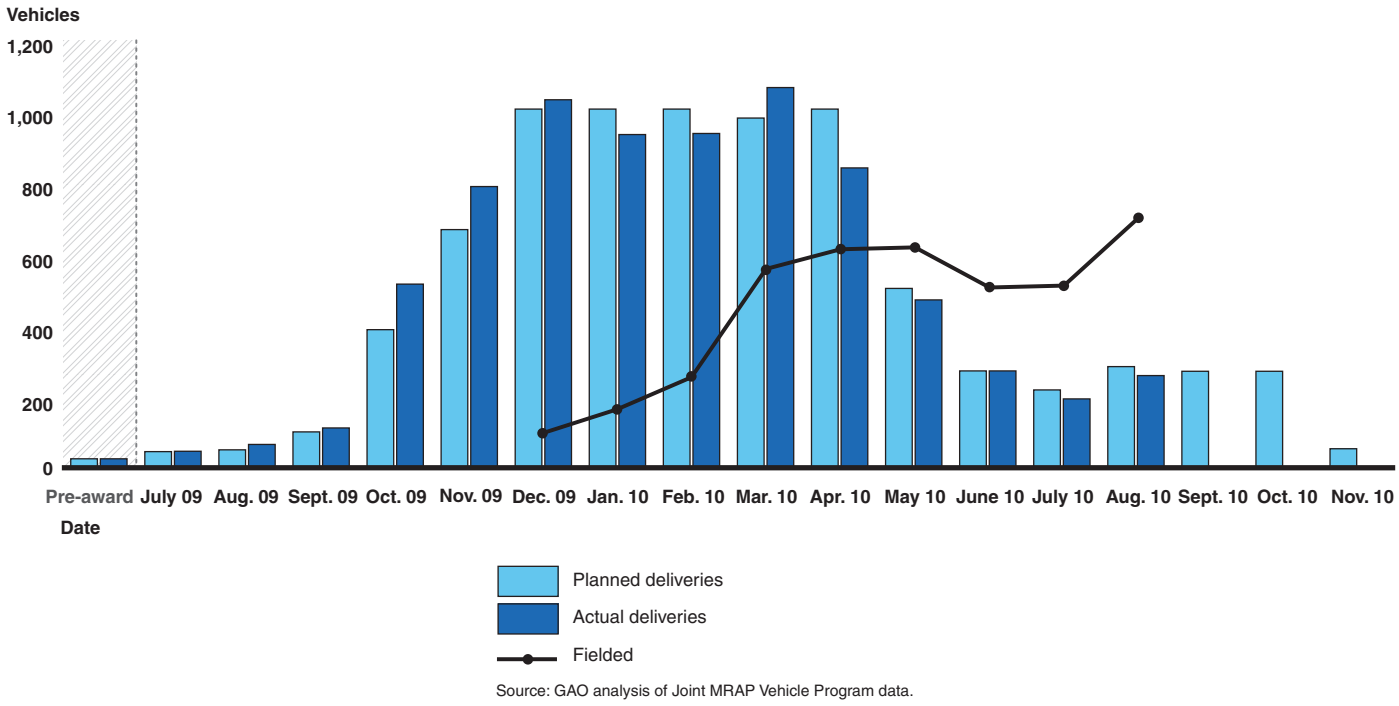
The government reserved the right to place production orders with multiple contractors as it had for the MRAP, but elected to issue a delivery order for production vehicles to a single contractor—Oshkosh Defense—after the vehicles completed the additional tests in June 2009. The contractor delivered the first 46 vehicles the next month and the first vehicles arrived in theater in December 2009, about 15 months after combatant commanders identified the need. By December, Oshkosh had ramped up delivery to its maximum of 1,000 vehicles per month and had delivered 300 more vehicles than planned in the first 6 months of the effort. The contractor consistently exceeded planned deliveries and has begun to ramp production back down, with planned deliveries ending in November 2010.

As of late August 2010, 7,488 vehicles had been delivered to the government and 4,379 vehicles had been fielded to units in Afghanistan. Fielding is expected to be completed in December 2010. DOD took several actions to expedite fielding, including beginning the process of installing vehicle mission equipment during the manufacturing process—a lesson learned from the MRAP production.[3] On MRAP vehicles, some work had to be done on the vehicles after production and before integration could begin, which took time. For example, wiring on the vehicles had to be reconfigured first to accommodate the mission equipment. On the M-ATV, the wiring was configured on the manufacturing line. Figure 1 compares

[3]The M-ATV vehicles, like MRAPs, are purchased without mission equipment—such as communications and situational awareness subsystems—which must be added before the vehicles can be fielded to the user. The military services buy the subsystems for their vehicles and provide them as government-furnished equipment (GFE) to be installed at a government integration facility located at the Space and Naval Warfare Systems Command in Charleston, South Carolina.

planned and actual deliveries of vehicles to the vehicles fielded through August 2010, and the planned deliveries through November 2010.

Figure 1: M-ATV Deliveries and Fielding



Source: GAO analysis of Joint MRAP Vehicle Program data.

M-ATV Acquisition Cost

As of June 2010, the cost to acquire the M-ATV is estimated to be about $12.5 billion through fiscal year 2024.[4] Through fiscal year 2010, all costs continue to be resourced through supplemental funding across all services, except for program management costs—approximately $55 million in fiscal years 2010 through 2015 to be budgeted into baseline service budgets. All other program costs will remain budgeted via annual supplemental requests until the services are able to determine long-term usage plans and add funding to their baseline budgets. It is not currently clear when the services will include MRAP and M-ATV operating and

[4]This cost reflects the M-ATV only and does not include funds already expended on earlier versions of the MRAP or the estimated cost to operate and support MRAP for the expected life of the vehicle.

support costs in the base budgets. Table 1 summarizes the estimated acquisition costs.

Table 1: Estimated Cost to Acquire 8,104 M-ATVs

(Then-year dollars in millions)

	Through Fiscal year 2010	Fiscal year 2011	Fiscal year 2012	Fiscal year 2013	Fiscal year 2014	Fiscal year 2015	Fiscal year 2016 through Fiscal year 2024
Research, Development, Test, and Evaluation	5.0	8.8	8.6	7.3	6.8	5.7	4.2
Procurement	10,840.9	382.8	196.5	200.6	204.8	163.8	430.5
Total	**10,845.9**	**391.6**	**205.1**	**207.9**	**211.6**	**169.6**	**434.6**

Source: MRAP Joint Program Office.

Note: Numbers may not add due to rounding.

The average unit cost for an M-ATV is about $1.4 million, including the vehicle, mission equipment, and transportation. Mission equipment—which the program office estimates will cost about $4.3 billion—includes communications and situational awareness subsystems. Procurement costs beginning in fiscal year 2011 are for expected upgrades to the vehicles. The estimate includes about $1.6 billion for fiscal years 2011 through 2018 to pay for upgrades to vehicles. For example, an increase in vehicle weight due to the addition of armor could in turn require upgrades to subsystems such as the independent suspension system and door assist. Other upgrades could include additional egress lighting, seat upgrades, and floor upgrades.

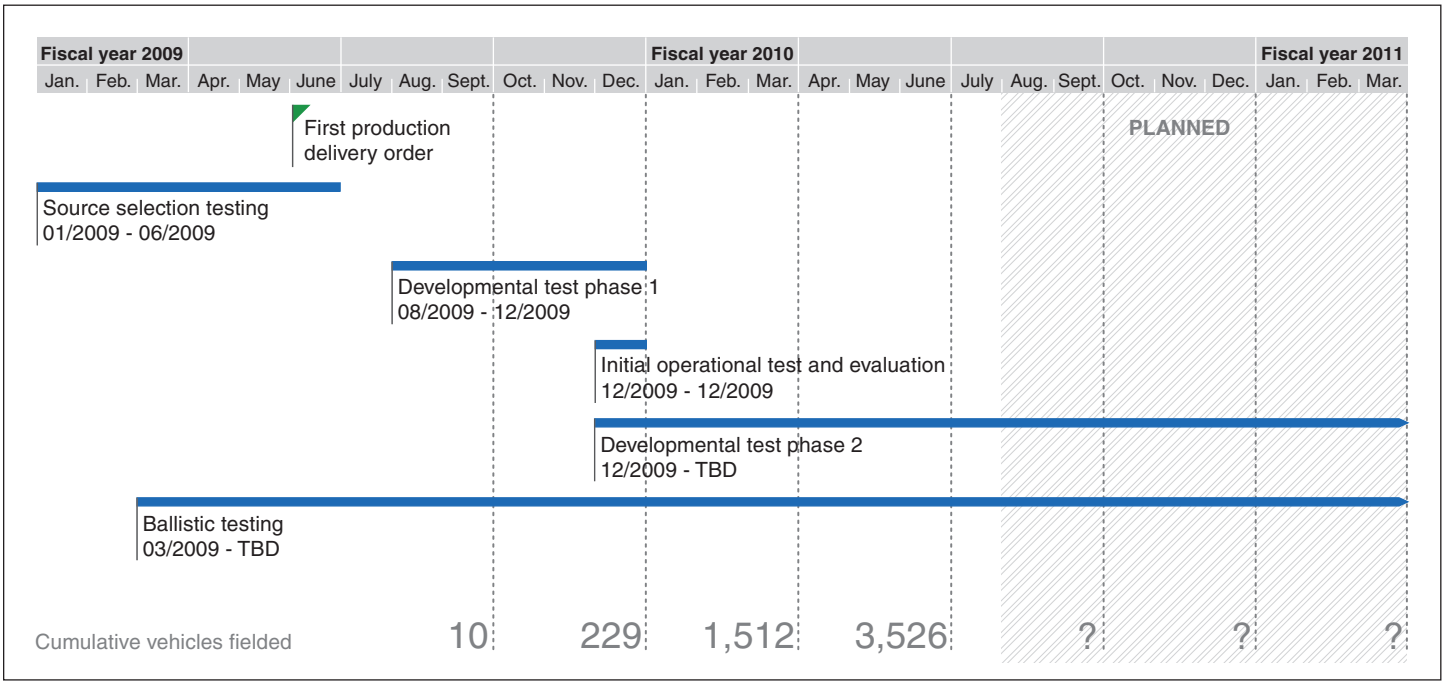
M-ATV Testing and Fielding Was Highly Concurrent

Conventional DOD acquisition policy reflects a statutory requirement that weapons be tested before they are fully fielded to the user.[5] However, due to the urgency of the requirement, and because the vehicle technologies and designs were mature, DOD began fielding the M-ATV in theater well before it completed the bulk of the planned testing. The test plan included ballistic tests, two phases of developmental tests, and operational test and evaluation. This approach resulted in a high degree of overlap between testing and delivery of the M-ATV. For example, 6,244 vehicles had already

[5]Successful development test and evaluation to assess technical progress against critical technical parameters, early operational assessments, and where proven capabilities exist, the use of modeling and simulation to demonstrate system integration are critical prior to beginning production. DOD Instruction 5000.02, *Operation of the Defense Acquisition System* (Dec. 8, 2008).

been placed on contract and 229 had been fielded before operational testing was completed in mid-December 2009.[6] Developmental testing is scheduled to continue even as fielding is completed in December 2010, according to an Army official. Figure 2 shows the concurrent nature of the overall test plan.

Figure 2: M-ATV Developmental and Operational Test Schedule



Source: GAO analysis of Joint MRAP Vehicle Program data.

Note: Additional testing may be needed to verify future upgrades.

DOD's emphasis that the competing contractors provide only mature, nondevelopmental vehicles was a key element in achieving the M-ATV schedule objectives. According to program officials, source selection testing of all the contractors' prototype vehicles further mitigated the risk associated with the concurrent M-ATV production and test schedule. Testing evaluated component- and system-level vehicle survivability and crew protection, and included multiple ballistic events against armor samples and candidate vehicles. Source selection also included

[6]Operational testing took place in the second and third weeks of December 2009.

automotive testing—such as human factors, mobility, braking, and steering—of the prototype vehicles. Before fielding began for any production M-ATVs, additional ballistic testing between October and December 2009 established that the vehicles met the requirements for crew protection and vehicle survivability and automotive testing confirmed that the vehicles were generally safe to operate.

The Director, Operational Test and Evaluation, in a June 2010 live-fire operational test and evaluation report, found that the M-ATV was operationally effective in the conduct of unit missions providing armored tactical mobility over Afghanistan terrain and that it demonstrated off-road mobility comparable to the up-armored HMMWV with the Expanded Capability Vehicle additional armor. The Director also found that the M-ATV was operationally suitable, although egress from the vehicle was difficult due to the location of some mission equipment, the height of the front seats, and potential damage to exterior door handles when the vehicle rolls over and there is no other means to open the door from the outside.

M-ATV Is Performing Well in Theater but Will Be Challenged to Keep Pace with the Threat

M-ATV vehicles appear to be performing well in their operational environment, according to program officials who monitor incident reports from the field.[7] Ballistic and automotive performance in the field mirrors that seen in testing. In addition, users report favorably on both aspects of the vehicles' performance. For example, a recent survey of users in theater found the vehicles are well accepted, have good mobility, and offer protection and survivability that is comparable to the MRAP. On the down side, users reported that visibility is limited and the vehicle is cramped, tall, and heavy.

Although the vehicle appears to be performing well in the operational environment, future challenges for the M-ATV include keeping pace with the evolving threat. The vehicle meets the current performance specifications and requirements, but the enemy keeps changing its tactics, according to the acquisition officials. The officials note that as the requirement for protection increases, for example, armor will have to be added, especially underbody—an effort that is already under way. They further note that modifying M-ATV vehicles in Afghanistan will be more

[7]Specific details on performance cannot be addressed in this report due to security classification.

difficult than it was to modify the MRAP in Iraq because Afghanistan has less infrastructure and fewer facilities to support it. According to acquisition officials, as the number of M-ATV in theater increases, this will be a challenge.

JLTV Expected to Feature More Balanced Payload, Protection, and Performance Than Other Vehicles, but Transportability and Reliability Are Recognized Risks

A comparison of JLTV's capabilities with those of the M-ATV and HMMWV indicates the JLTV is expected to offer protection levels comparable to the M-ATV at a weight nearer to the HMMWV. The JLTV is early in its development and its acquisition cost has not yet been determined, but is expected to be substantial. The JLTV acquisition strategy calls for an incremental, knowledge-based approach, reflective of best practices. The services have recognized transportability and reliability as risks and are considering design and requirement tradeoffs to reduce these risks. For example, to meet the transportation requirement, the services have made the decision to focus on a four-passenger vehicle in the first increment rather than a six-passenger vehicle. Testing of prototypes from each of the contractor teams is under way and is being used to validate and refine requirements and to reduce technical risks prior to the EMD phase. Scheduled to start in late fiscal year 2011, the EMD phase is a crucial point for the program. The Under Secretary of Defense for Acquisition, Technology, and Logistics established several exit criteria that must be completed prior to competitively awarding contracts for the EMD phase.

JLTV Acquisition Strategy Is Incremental

The Army and Marine Corps are pursuing an incremental development approach for JLTV that would feature a basic capability initially—with enhanced force protection, increased fuel efficiency, greater payload, and other improvements to be added in later increments. DOD acquisition policy[8] defines an increment as a militarily-useful and supportable operational capability that can be developed, produced, deployed, and sustained. As we have observed in an earlier report, each increment will need to provide needed capabilities within cost and schedule projections and be justifiable on its own.[9]

The services currently plan to acquire 60,383 vehicles in the first increment of JLTV. For that first increment, three categories of JLTV vehicles are

[8]DOD Instruction 5000.02, *Operation of the Defense Acquisition System* (Dec. 8, 2008).

[9]GAO, *Defense Acquisitions: Decisions Needed to Shape Army's Combat Systems for the Future*, GAO-09-288 (Washington, D.C.: Mar. 12, 2009).

being developed with different payload capabilities and expected use. The Category A vehicle is expected to have a payload of 3,500 pounds and is being developed for general-purpose mobility to move reconnaissance and surveillance teams. The Category B vehicle is expected to have 4,000 to 4,500 pounds of payload capability and is being developed to move infantry, weapons, security forces, and tactical command and control. The Category C vehicle is a utility vehicle being developed for combat support missions and is planned to carry shelters and light cargo and operate as an ambulance. Table 2 summarizes the different JLTV categories and subconfigurations.

Table 2: Summary of JLTV Categories and Subconfigurations

Category A	Category B	Category C
Mission area: Battlespace Awareness	Mission area: Force Application	Mission area: Focused Logistics
Payload: 3,500 pounds	Payload: 4,000-4,500 pounds	Payload: 5,100 pounds
Subconfigurations	Subconfigurations	Subconfigurations
General-Purpose Mobility (4 seat)	Infantry Carrier, Fire Team (6 seat)	Shelter Carrier/Utility/Prime Mover (2 seat)
	Reconnaissance—Army (6 seat)	Ambulance (3 seat + 4 litter)
	Command and Control On the Move (4 seat)	
	Integrated Target Acquisition System Tube-launched Optically-tracked Wire-guided missile (4 seat)	
	Utility—Marine Corps (2 seat)	
	Ambulance (3 seat + 2 Litters)	

Source: JLTV Program Office.

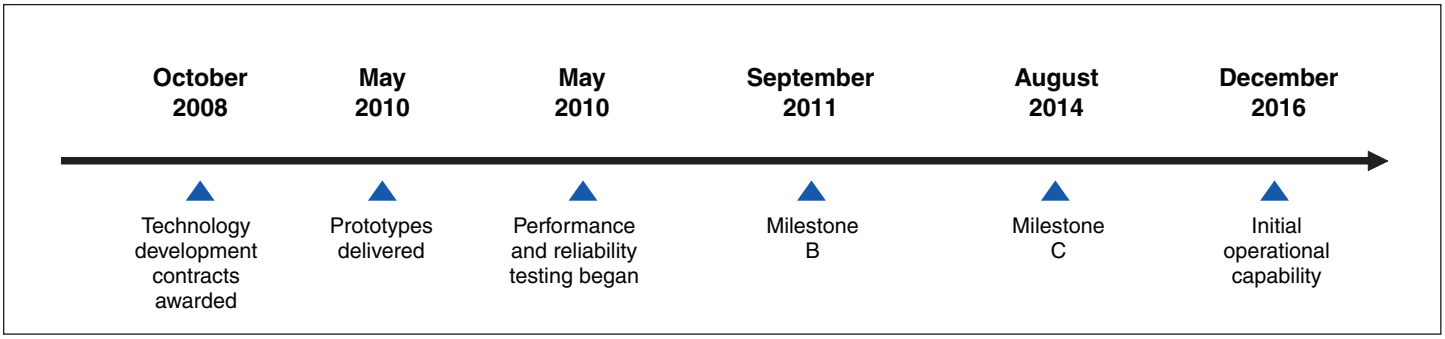
Note: Shaded areas indicate that program focus during technology development phase is on these subconfiguration vehicles.

The Army awarded JLTV technology development contracts to three industry teams[10] in October 2008, for a total of $263.7 million; however, a bid protest delayed the actual start of work until February 2009. The

[10]The teams are BAE Systems Land & Armaments, Ground Systems Division; General Tactical Vehicles, a joint venture between General Dynamics Land Systems and AM General; and Lockheed Martin Systems Integration.

36-month technology development effort features competitive prototyping. It includes 15 months for design and build and 12 months for testing prototype vehicles. Prototype testing is under way at the Aberdeen and Yuma test facilities.

Figure 3: JLTV Timeline of Selected Major Events



Source: Army Joint Combat Support Systems.

The services plan for a full and open competition to select two contractors for the EMD phase and one contractor from those two will be selected for the production phase. DOD is planning the Milestone B decision for JLTV during the fourth quarter of fiscal year 2011, with a contract award scheduled for the first quarter of fiscal year 2012. The EMD phase is scheduled to last almost 3 years and culminate with a Milestone C decision point in late fiscal year 2014. A fixed-price production contract is expected to be awarded in the first quarter of fiscal year 2015. The initial operating capability is expected early in fiscal year 2017. An analysis of alternatives for the JLTV is required to support a Milestone B decision on the program and will be provided to DOD's Cost Assessment and Program Evaluation group 60 days in advance of the Defense Acquisition Board review. The purpose of the analysis of alternatives is to assess alternatives for capitalizing the fleets of light tactical vehicles currently operated by the four services.

At Milestone B, DOD may consider an early start of initial production for a JLTV variant if technical maturity and risks are deemed appropriate. That would assume that JLTV prototypes would be at a high level of technical maturity and their designs very stable. Currently, it is unknown how this would affect the contractor competition plans, which call for two contractors to proceed through EMD.

JLTV to Offer Protection Comparable to M-ATV and More Protection Than HMMWV

JLTV is being designed to protect its occupants from the effects of mines and improvised explosive devices without sacrificing its ability to carry a payload or its automotive performance, which has not been the case with other TWVs. The improved balance of capabilities expected from the JLTV is summarized in table 3, which compares the capabilities of the M-ATV, the JLTV, and the current generation of HMMWVs.

Table 3: Comparison of Expected JLTV Capabilities with Capabilities of Other Vehicles

Capability	M-ATV	Current generation HMMWVs[a]	JLTV
Turning radius (feet)	54	25	25
Payload (pounds)	4,000	1,800—3,950	3,500—5,100
Gross vehicle weight (GVW) (pounds)	32,500	12,100—14,800	19,950—23,950 (estimated)
Maximum speed at GVW (miles per hour)	65	63.8	70
Minimum range (miles)	300	250	400
Transportable at GVW (internally, externally)	C-130 w/waiver	C-130, CH-53, CH-47	C-130, CH-53, CH-47F
Transportable on height-restricted decks (76 inches)	No	Yes – some versions	Yes[b]
Reliability (mean miles between operational mission failure)	600	800—-2,250	4,500—-5,170
Operational availability (percentage)	80	90	95
Power generation-on-board/exportable (kilowatt)	12.7/0	1.2/0	20/10
Ground clearance (inches)	13.6	13-17	24
Underbody protection[c]			
—Mines	3	2	3
—IED	3	1	2
Side protection[c]			
—IED	4	4	4
—EFP	3	2	2
—RPG	1	1	2
—Small arms	4	4	4
Estimated base price per system (without GFE and other costs)	$445,000	$186,000	$306,000—$332,000

Source: GAO analysis of Army information.

Note: Those capabilities where JLTV is projected to be better than the other two vehicles have been highlighted.

[a]Expanded Capability Vehicle (ECV)/up-armored HMMWV (UAH) with the B-Kit armor.

[b]An adjustable suspension system will permit JLTV to meet this requirement.

[c]The numbers indicate protection levels. The higher the number, the better protection level.

Our comparison of TWV capabilities indicates that the JLTV capabilities are expected to balance personnel protection, payload, and performance,

provide defensive measures covering troops while in transport, and increase payload capability. In the performance area, JLTV is intended to be better than the M-ATV and HMMWV in terms of turning radius, cross-country speed, acceleration, minimum range, power generation, and ground clearance. In addition, JLTV operational availability is intended to be better than both other vehicles. The JLTV's payload, protection, and performance will be equal to or better than the Expanded Capability Vehicle (ECV)/Up-armored HMMWV (UAH) in all categories.[11]

Unlike the M-ATV, the HMMWV is and the JLTV is planned to be transportable by helicopter. JLTV's level of protection is expected to be significantly better than ECV/UAH, especially the underbody protection. The JLTV payload requirement is a minimum of 3,500 pounds for its general-purpose mobility vehicle and 5,100 pounds for its utility vehicle. Those levels are comparable to the M-ATV payload and better than the HMMWV levels. The reliability of the JLTV is projected to be 3,900 miles better between operational mission failures than the M-ATV and more than 2,250 miles better between operational mission failures than the ECV/UAH.

Achieving Transportability and Reliability Requirements Is a Recognized Program Risk

Unlike the M-ATV, the JLTV program will need to demonstrate emerging technologies to determine if it can meet its proposed requirements. The services are not directly developing new technologies for JLTV, but are expecting the competing contractors to use new and existing technologies in their prototype vehicles. The purpose of the JLTV technology development phase is to validate the maturity of those technologies and to provide test data to evaluate the technical risks in meeting the proposed requirements for the JLTV family of vehicles. The knowledge gained from the tests will be used to assess the capability of meeting critical requirements such as force protection, mobility, transportability, reliability and maintainability, and technical performance.

The Army Test and Evaluation Command is conducting JLTV testing at Aberdeen Proving Ground and Yuma Proving Ground. Ballistic testing of samples of the vehicle armor began in September 2009 and has been completed, but results are not yet available. Ballistic testing of vehicle hulls began in December 2009 at Aberdeen. The three contractors

[11]The HMMWV has evolved since its initial introduction in 1984 to add greater protection against improvised explosive devices. The UAH/ECV is a newer version of the HMMWV.

delivered prototype vehicles in May to Aberdeen and Yuma and testing has begun. Vehicle performance testing is being conducted at Aberdeen and reliability, availability, and maintainability testing is being conducted at Yuma. On the basis of the initial analysis of physical characteristics, the majority of the prototypes are within the current limits for vehicle weight. Testing on the prototypes is expected to last about a year and a formal test report will be issued at the end of testing. Interim reports will be issued throughout the year.

The technology development phase is currently scheduled for completion in the fourth quarter of fiscal year 2011, to be followed by the Milestone B decision review. According to direction from the milestone decision authority, the following technology development phase exit criteria are expected to be completed for the Milestone B decision point:

- approval of the appropriate capabilities development document, supported by analysis from technology development work,
- demonstration of a technology readiness level 6 or higher for all critical technologies in an integrated system,[12]
- an assessment of commonality across the JLTV family of vehicles, and
- an assessment of the technical risks relevant to entering initial production.

Under best acquisition practices,[13] the JLTV program would need to achieve a match between its requirements and available resources (technologies, money, and schedule) at the Milestone B decision point and before proceeding into the EMD phase. During the remainder of the technology development phase, the task for the JLTV program will be to determine, through the system engineering process, whether the proposed requirements can be met with the resources expected to be available including existing technologies. If that match cannot be demonstrated, the program may have to adjust the requirements to more achievable levels or increase its estimate of resources needed. Fully resolving these questions with knowledge at the Milestone B point is a key to establishing a sound business case for the JLTV program. Such knowledge would include a

[12]The services have not yet identified specific critical technologies for JLTV. They have identified technology categories for each of the key performance parameters. For example, the underbody armor technology category has been associated with the transportability critical performance parameter.

[13]GAO, *Defense Acquisitions: Assessments of Selected Weapon Programs*, GAO-10-388SP (Washington, D.C.: Mar. 30, 2010) and *Defense Acquisitions: DOD Must Balance Its Needs with Available Resources and Follow an Incremental Approach to Acquiring Weapon Systems*, GAO-09-431T (Washington, D.C.: Mar. 3, 2009).

completed preliminary design review, evidence of robust system engineering analyses, and a technology readiness assessment. Our prior work has consistently shown that a sound business case is a critical determinant of a program's ultimate success.[14] The JLTV program has identified risks in achieving some of its key requirements and is considering trade-offs in vehicle designs and requirements.

Transportability and force protection are key performance parameters for JLTV, but the vehicle's currently projected weight may preclude its transport by rotary wing aircraft. The vehicle's weight is driven by the level of force protection expected from JLTV. Force protection is achieved with armor and the currently available armor is heavier than desired. JLTV vehicles are being designed with a basic layer of armor that is integrated with the chassis and additional armor that is bolted on over that basic layer of armor. Transportability by rotary winged aircraft is a critical joint requirement, with the potential that the Marine Corps could withdraw from the program if rotary wing transport of JLTV is not possible. The services are using 15,600 pounds, the lift capacity of the CH-47F, to determine the maximum transport weight of the vehicle. The transport weight differs from the gross vehicle weight in that the add-on armor is removed prior to transport by aircraft. However, the JLTV program is concerned that the transport weight may be in excess of the CH-47F's lift capacity. In order to meet the weight limit, the services are considering design and requirement trade-offs. Although a six passenger Category B vehicle was the original joint priority, the services are now focusing on a four-passenger vehicle, at least initially. According to program officials, the technology will not have advanced far enough to make armor light enough to build a six-passenger vehicle with the needed protection level and at a transport weight that can be transported by the CH-47F. As a result, the services are proposing to build a four-passenger vehicle in the first increment. A six-passenger vehicle is still under consideration by the Army for the first increment; however, it would not be in the initial procurement. Progress in armor technology development and demonstration—and its impact on JLTV force protection and transportability requirements—will be evaluated throughout the technology development phase and at the Milestone B review.

[14]GAO, *Defense Acquisitions: Strong Leadership is Key to Planning and Executing Stable Weapon Programs*, GAO-10-522 (Washington, D.C.: May 6, 2010).

The JLTV requirement for operational availability has been set at 95 percent and is considered a key performance parameter. JLTV reliability is a key system attribute and is an element within operational availability. The original technology development requirement was 4,500 mean miles between operational mission failures for the Category B vehicles and 6,100 miles for the Category A and C variants. This level of reliability may be aggressive since it is two to three times greater than the reliability levels for other tactical vehicles. For example, the M-ATV requirement is 600 miles between failures and at least one version of the ECV/UAH has a reliability of less than 1,300 miles between failures. If the JLTV reliability metrics cannot be met, availability will suffer and total ownership cost, another key system attribute, could increase significantly. While contractor modeling suggests that JLTV will meet its requirements at the subcomponent level, program officials remain uncertain. The services are conducting extensive reliability testing of JLTV prototypes during the technology development phase. However, according to program officials, the reliability requirement is up for reconsideration and may need to be adjusted. Also, the services have a plan to increase the reliability for EMD.

JLTV Cost Is Not Yet Known but Will Be Substantial and Affect Affordability

JLTV investment to date has been modest—about $300 million for the technology development phase through fiscal year 2010. However, JLTV funding will be expanding in the coming years. From fiscal years 2011 through 2015, an additional $580 million will be needed for JLTV development through the EMD phase. JLTV production funding is currently projected to start in fiscal year 2013. Through fiscal year 2015, the services are projecting JLTV procurement funding of about $2.7 billion.

JLTV's total acquisition costs could ultimately be substantial. The target unit production cost for JLTV ranges from $306,000 to $332,000, depending on vehicle category. That compares to the base M-ATV unit price of about $445,000. The JLTV target cost does not include general and administrative cost and fees. Armor kits and mission equipment packages are also additional, which have not yet been determined. As a reference point, the cost of government-furnished equipment averaged $532,000 per vehicle for the M-ATVs. If similar costs apply to JLTV, its procurement unit cost could be in excess of $800,000.

An independent cost estimate will be developed in support of Milestone B decision review; however, the vehicle cost will be substantial when calculating the cost of the first increment. The joint requirement is for 60,383 vehicles to be bought and fielded by fiscal year 2022. Using the

lowest projected vehicle cost of $306,000, the cost of 60,383 JLTV vehicles would be almost $18.5 billion and much more when government-furnished equipment[15] and other costs are included.

JLTV's affordability will be a key determination at the Milestone B decision point. The services and DOD will have to balance the cost of the JLTV against other service needs. The cost could determine whether to continue with the program as planned, look at other ways of meeting the requirements, or buy fewer vehicles.

Uncertainty about Future MRAP, HMMWV, and JLTV Decisions May Affect Planned TWV Investments

The acquisition plans for both the M-ATV and JLTV are consistent with the services' TWV strategies, which emphasize maintaining a balance of performance, payload, and protection capabilities across their TWV fleets as they continue to adjust to the improvised explosive devices/roadside bomb threats. M-ATV fulfills a short-term, joint, urgent operational need in support of current operations and JLTV is the long-term solution for the joint services to replace the HMMWV. The strategies indicate that the services plan to recapitalize older HMMWVs in the inventory, integrate MRAPs, including M-ATVs, into their respective fleet mixes, and acquire JLTVs if costs and performance goals can be achieved. However, those assumptions could be affected by several forthcoming decisions and events, including those related to (1) the development of revised plans for continued production of new HMMWVs or recapitalization of older HMMWVs; (2) the availability of sufficient funds in the base budgets for the operation and support of those MRAP vehicles to be integrated into the service fleets; and (3) the extent to which the JLTV program can meet cost, schedule, and performance expectations. These events and decisions could change how and when the strategies are implemented as well as the specific composition of the TWV fleets in the coming years.

Current Service Strategies Are Based on Four Tenets and Highlight Need for Affordability

The Army's October 2009 strategy reiterated that the 2008 Army and Marine Corps joint TWV investment strategy was based on four tenets:

- Take maximum advantage of existing platforms by recapitalizing their platforms and introducing product improvements.
- Plan for the integration of MRAP vehicles into the fleet mixes.

[15]The specific government-furnished equipment to be used in JLTV has not yet been determined.

- Emphasize a mixed fleet approach that spans the "iron triangle" of protection, payload, and performance.
- Transition to a fleet of tactical vehicles that have scalable protection (integrated A-kit and add-on-armor B kits).

Both services have also acknowledged that planning uncertainties included JLTV cost and performance, and emphasize the need for the adoption of TWV strategies that are affordable as a whole. The Army strategy states that in an era of constrained financial support and ever-increasing materiel costs, it will work to control cost growth and variant complexity within the TWV fleet. The Marine Corps strategy states that the underlying guidance for the strategy requires the fielding of an affordable fleet of ground combat and tactical vehicles that provide required capabilities and adequate capacity. Each of the underlying tenets, as well as the consideration of affordability, may be affected by one or more forthcoming events and decisions.

Uncertainty about the Future of HMMWV Production and Recapitalization Programs

The first tenet of the respective Army and Marine Corps strategies is that the services would recapitalize existing platforms and introduce product improvements. In fiscal year 2010, the Army planned to reprogram approximately $560 million to the HMMWV Recapitalization program, $13 million to initiate a competitive effort to assess alternative solutions to recapitalize up-armored HMMWVs, and use the remaining funds to support other unspecified Army priorities. The HMMWV Recapitalization program converts older utility HMMWVs into upgraded configurations. Begun in 2004, approximately 30,000 vehicles have been recapitalized at a cost of approximately 35 percent of the value of a new production light-utility vehicle. The strategy also reported that the recapitalized vehicles are "like-new" and will serve the Army for an additional 15 years. In January 2010, the Army also began a pilot program to recapitalize up-armored HMMWVs to the same level of performance and protection as the newest production up-armored HMMWVs.

Subject to the approval of the requested reprogramming and the availability of funds, the Army planned to continue the recapitalization of nonarmored HMMWVs and the up-armored HMMWVs to ensure continued sustainment of the HMMWV fleet in the near term, and competitively procure and test prototypes that demonstrate survivability improvements that may be possible on the expanded-capability vehicle HMMWV chassis. However, because the Army's requested reprogramming action has been denied by the Congress, all recapitalization plans have been suspended pending the development of revised plans for the HMMWV production and

recapitalization programs. Until the scope and cost of those plans are clarified, it may be difficult for the services to identify the funds that may be available to support other TWV needs, such as long-term funding for MRAP and M-ATV operations and support, and to define what they can afford in terms of JLTV procurement.

Long-term Funding for MRAP and M-ATV Operations and Support

The second underlying tenet of the services' TWV strategies involves the planning for the integration of MRAP vehicles (including the M-ATV) into the fleet mixes. By the end of fiscal year 2010, the Army and Marine Corps will have invested $35.7 billion to acquire the MRAP family of vehicles and most of these vehicles have been delivered to units operating in Iraq and Afghanistan. Also, improved suspension systems have been added on some original MRAP vehicles to maintain acceptable levels of protection while improving automotive performance.

In general, DOD considers the MRAP vehicle an important part of the tactical vehicle portfolios, but not one that replaces the need for other vehicles in the force structure, such as HMMWVs or JLTVs. Despite the significant investment in MRAP vehicles, it is not likely that MRAPs would be used to offset quantities of JLTVs, although MRAPs may be able to offset some quantities needed for route clearance, explosives ordinance disposal, and medical evacuation units. In addition, the continuation of operations in Iraq and Afghanistan will influence the quantities of MRAP vehicles available for integration into the services' force structures, the pace of the integration, and the funding for operations and support costs by the services.

The military services continue to refine their plans to integrate the M-ATV—and its predecessor, the MRAP—into the force structure. As of June 2010, the Army had more than 19,800 M-ATV and MRAP vehicles in the theater and in the continental United States. The Marine Corps has a combined MRAP and M-ATV fleet of about 3,300 vehicles. Both services acknowledge the potential operating and support costs as a factor that could affect implementation of their plans. Thus far, most of the cost to acquire, field, operate, and sustain the M-ATV and the MRAP has been funded through supplemental appropriations. However, beginning in 2012, the services will likely assume at least part of the operation and sustainment costs for these vehicles, according to MRAP Joint Program Office officials.

While the cost to operate and sustain the vehicles for their expected service life will depend on the military services' specific plans to integrate

the vehicles into their force structures, the MRAP joint program office estimates that the cost to operate and maintain the vehicles through 2024 will be about $10.8 billion. With much of it currently funded out of supplemental appropriations, the services have expressed some concerns about their ability to fund operations and support costs for TWVs in the out years within base budget requests. For example, Marine Corps officials acknowledged that the projected cost to sustain their tactical vehicle fleet contributed to a decision to reduce the quantities of tactical vehicles by 30 percent over the next few years. A senior Army headquarters official told us that the Army would likely be requesting funds for sustainment in its overseas contingency operations budget request for fiscal year 2012 to supplement sustainment in its base budget.

JLTV Identified as a Key Future Capability, but It Has Cost and Performance Uncertainties

The strategies' third and fourth tenets of rebalancing payload, performance, and scalable protection are intended to be provided by JLTV. Both the Army and Marine Corps TWV investment strategies identify JLTV as an important future capability. Both services have acknowledged that planning is complicated by current JLTV cost and performance uncertainties. The strategies recommend the scheduling of dates within the yet to be developed TWV Modernization Strategy by which current/legacy light tactical vehicles will no longer be procured and the procurement focus switched to JLTV variant production. The Army's October 2009 strategy identifies the JLTV Force Application vehicles as the objective solution for the armament carrier mission. The strategy states that this payload category is the Army's number one priority for development and fielding. However, as discussed previously, this category of JLTV vehicles is at risk of not meeting the transportability requirement due to their projected weight and the projected requirement for reliability is two to three times greater than other tactical vehicles.

Implications for DOD-wide TWV Strategy

Last year, we reported that DOD does not have a comprehensive TWV investment strategy and concluded that the development of a strategy would be beneficial to DOD and the services in minimizing the potential for unplanned overlap or duplication.[16] In commenting on the report, DOD stated that it plans to prepare a departmentwide strategy for making sound

[16]GAO, *Defense Acquisitions: Department of Defense Needs a Unified Strategy for Balancing Investments in Tactical Wheeled Vehicles*, GAO-09-968R (Washington, D.C.: Sept. 28, 2009).

TWV investment decisions that it says will dovetail with the services' equipping strategies and will endeavor to align requirements, resources, and acquisition strategies into a unified plan. However, as of September 2010, DOD has not yet set a timetable for completing the strategy.

In recommending such a strategy and implementation plan in 2009, we noted that DOD should

- assess and prioritize the capabilities and requirements of similar vehicles needed in the near and long term;
- estimate the funding, time, and technologies that will be required to acquire, improve, and sustain these systems;
- balance protection, payload, and performance needs with available resources, especially for light tactical vehicles; and
- identify contingencies in case there are development problems, delays with key systems, or funding constraints.

There are several issues specific to TWVs which will likely influence the DOD-wide strategy. These include the near-term decisions and events related to the continued production or recapitalization of HMMWVs, the operational requirements for MRAPs (to include the M-ATV), and the projected cost and capabilities of the JLTV family of vehicles. In addition, the Secretary of Defense has recently announced several initiatives to free-up funds for modernization and to create efficiencies in programs. This is a contingency that may also have an influence on the DOD-wide strategy by reinforcing the need to minimize the potential for unplanned overlap or duplication. For example, up until now, the services have not considered the vehicles in the MRAP family—with the exception of some vehicles planned for use by route clearance, explosives ordinance disposal, and medical evacuation units—to offset the need for or replace other TWVs. Given the high potential cost of the JLTV, an offset could offer substantial savings, albeit with potential performance tradeoffs. To illustrate, a 5 percent reduction in JLTV quantities could save nearly $2.5 billion, assuming a unit cost of $800,000; a 10 percent reduction could save nearly $5 billion. While the Army and Marine Corps have completed and continue to conduct engineering, cost, funding, and vehicle mix analyses, neither service has performed a formal cost-benefit analysis to consider savings from JLTV offsets or costs of increasing recapitalization of existing vehicles.

Conclusions

The M-ATV program has been successful, delivering well-performing vehicles early and at an estimated cost of $12.5 billion. Common to the success of the larger MRAP vehicles produced earlier, the M-ATV program did not have new technologies to develop. JLTV is a well-structured program with desirable features, such as a competitive technology development phase with an incremental approach to fielding increasingly capable vehicles. Unlike the M-ATV and MRAP, JLTV has demanding requirements—to provide MRAP-like protection at HMMWV-like weight—that necessitate technological and engineering advances. It is less certain, then, that at the conclusion of the technology development phase, a JLTV solution will emerge that provides all of the performance required, yet stay within weight limits and deliver the desired high reliability. Before the decision can be made to proceed into the engineering and manufacturing development phase, the precursor to production, DOD may find that tradeoffs are necessary to match JLTV requirements with available resources (including time, money, and technical knowledge).

The knowledge of what is achievable with JLTV should be in hand by late fiscal year 2011. Also, by that time, the services should have a better understanding of (1) the scope and cost of the HMMWV recapitalization or production effort, and (2) the placement of the MRAP family of vehicles in the services' force structures, including funding in base budgets for operating and support costs. To the extent the DOD-wide TWV strategy captures the knowledge gained from these activities, it can provide a sound guide for making near-term decisions that facilitate attainment of longer term objectives. In so doing, the DOD-wide strategy can help reconcile the aggregate affordability and other implications of these programs with the competing demands of the department. Specifically, any potential offsets between the MRAP vehicles and JLTVs, to the extent they are supported by cost-benefit analyses, could save both acquisition and support costs.

Recommendations for Executive Action

We recommend that the Secretary of Defense:

- Enhance the prospects for the successful outcome of the JLTV program by ensuring that the JLTV program clearly demonstrates at the Milestone B decision point that it has achieved a match between its requirements, particularly the transportability and reliability requirements, and available resources (technologies, funding, and schedule) before beginning its EMD phase.
- Stage the timing of the DOD-wide TWV strategy so that it captures the knowledge gained during the year from the JLTV technology development

phase, as well as from the decisions made on the HMMWV and MRAP programs.

- Include in the strategy a cost-benefit analysis that could minimize the collective acquisition and support costs of the various TWV programs, and reduce the risk of unplanned overlap or duplication. Such cost-benefit analysis should provide an estimate of dollar savings for various options for offsetting JLTV quantities in favor of recapitalizing existing vehicles.

Agency Comments and Our Evaluation

In its comments on our draft report, DOD concurred with all of our recommendations. DOD's response is reprinted in appendix II.

On our recommendation that the JLTV program clearly demonstrate that it has achieved a match between its requirements and available resources, DOD concurred and noted that this is a Milestone B requirement. We made the recommendation because the requirements for JLTV transportability and reliability are recognized risks and tradeoffs will be needed to achieve an appropriate balance of requirements and resources at the Milestone B decision point. Such tradeoffs will need to be supported by quantifiable evidence and rigorous analysis.

Regarding our recommendation on the DOD-wide TWV strategy, DOD concurred, noting that the DOD-wide TWV strategy will not be limited to the JLTV, HMMWV, and MRAP vehicles and will leverage the Army TWV strategy to be released shortly. We agree that because of the size of its TWV fleet and acquisitions, it seems reasonable for DOD to leverage knowledge from the Army strategy. However, in the end, it is essential for DOD to ensure that the services' desire to have the most modern, capable TWVs is balanced with fiscal realities.

On our final recommendation that calls for cost-benefit analyses to reduce the risk of unplanned overlap and duplication among the TWV programs, DOD concurred and stated that the JLTV program is conducting an Analysis of Alternatives that explores potential offsets to JLTV quantities, including those related to the placement of MRAPs in authorized brigades. DOD also notes that the recapitalization of existing vehicles is a major component of an affordable TWV strategy. We appreciate DOD's initiatives to manage its TWV portfolio in a balanced and affordable manner.

We are sending copies of this report to the Chairmen and Ranking Members of other Senate and House committees and subcommittees that have jurisdiction and oversight responsibilities for DOD. We will also send

copies to the Secretary of Defense; the Secretaries of the Air Force, Army, and Navy; and the Director, Office of Management and Budget. Copies will also be available at no charge on GAO's Web site at http://www.gao.gov.

If you or your staff have any questions about this report, please contact me at (202) 512-4841. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Major contributors to this report included William Graveline, Assistant Director; Dayna Foster; Danny Owens; Bob Swierczek; Hai Tran; Paul Williams; and Marie Ahearn.

Michael J. Sullivan, Director
Acquisition and Sourcing Management

Appendix I: Scope and Methodology

To determine the Department of Defense's (DOD) strategy for and progress in rapidly acquiring and fielding the Mine Resistant Ambush Protected (MRAP) All Terrain Vehicle (M-ATV), we obtained and reviewed program documents and held discussions with system developers, acquisition officials, and contractor representatives. To determine the cost of M-ATV, we obtained and reviewed cost estimates and held discussions with program officials. To determine the challenges that remain for the M-ATV program, we held discussions with system developers, acquisition officials, and technologists. Discussions were held with officials from Department of the Army, Office of the Deputy Chief of Staff, G3/5/7, Arlington, Virginia; Army Tank and Automotive Command, Research, Development and Engineering Center, Warren, Michigan; Defense Contract Management Agency, Oshkosh, Wisconsin; Joint MRAP Vehicle Program Office, Stafford, Virginia; Marine Corps Combat Development Center, Quantico, Virginia; Marine Corps Systems Command, Quantico, Virginia; and Oshkosh Corporation, Oshkosh, Wisconsin. To determine the demonstrated performance of the M-ATV, we obtained and reviewed test reports and held discussions with officials from the Army Test and Evaluation Command, Aberdeen Test Center, Aberdeen, Maryland; and the National Ground Intelligence Center, Charlottesville, Virginia.

To determine the expected features of the Joint Light Tactical Vehicle (JLTV) as it moves toward Milestone B in fiscal year 2011, we obtained and reviewed updated program documents and held discussions with Army and Marine Corps acquisition and test officials. Using comparison data provided by Army officials, we prepared a table comparing JLTV's expected features and cost with those of the M-ATV and current generation High Mobility Multi-purpose Wheeled Vehicle. We held discussions with officials from the Army, Program Manager, Tactical Vehicles, Warren, Michigan; Army, Product Manager, Joint Light Tactical Vehicle, Selfridge Air National Guard Base, Michigan; and the Army Test and Evaluation Command, Aberdeen Proving Ground, Aberdeen, Maryland.

To determine the extent to which current plans for M-ATV and JLTV are consistent with Army and Marine Corps tactical wheeled vehicle investment strategies, we obtained and reviewed updated strategies and held discussions with DOD, Army, and Marine Corps officials. Discussions were held with officials from the Under Secretary of Defense, Acquisition, Technology, and Logistics, Arlington, Virginia; Army, Office of the Deputy Chief of Staff, G8, Arlington, Virginia; Assistant Secretary of the Army, Acquisition, Logistics, and Technology, Arlington, Virginia; and Marine Corps Systems Command, Quantico, Virginia.

We conducted this performance audit from November 2009 to November 2010, in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix II: Comments from the Department of Defense

ACQUISITION, TECHNOLOGY AND LOGISTICS

OFFICE OF THE UNDER SECRETARY OF DEFENSE
3010 DEFENSE PENTAGON
WASHINGTON, DC 20301-3010

NOV - 2 2010

Mr. Michael J. Sullivan
Director, Acquisition and Sourcing Management
U.S. Government Accountability Office
441 G Street, N.W.
Washington, DC 20548

Dear Mr. Sullivan:

This is the Department of Defense (DoD) response to the GAO draft report, GAO-11-83, "DEFENSE ACQUISITIONS: Issues To Be Considered as DoD Modernizes Its Fleet of Tactical Vehicles," dated September 21, 2010 (GAO Code 120854).

The Department concurs with the three recommendations. The rationale for our position is enclosed.

We appreciate the opportunity to comment on the draft report. My point of contact for this effort is Ms. Deb Struck, Deborah.Struck@osd.mil, 571-256-4195.

Sincerely,

Darlene Costello for

David G. Ahern
Director
Portfolio Systems Acquisition

Enclosure:
As stated

GAO DRAFT REPORT DATED SEPTEMBER 21, 2010
GAO-11-83 (GAO CODE 120854)

"DEFENSE ACQUISITIONS: ISSUES TO BE CONSIDERED AS DOD MODERNIZES ITS FLEET OF TACTICAL VEHICLES"

DEPARTMENT OF DEFENSE COMMENTS TO THE GAO RECOMMENDATIONS

RECOMMENDATION 1: The GAO recommends that the Secretary of Defense: Enhance the prospects for the successful outcome of the JLTV program by ensuring that the JLTV program clearly demonstrates at the Milestone B decision point that it has achieved a match between its requirement, particularly the transportability and reliability requirements, and available resources (technologies, funding, and schedule) before beginning its engineering and manufacturing development phase.

DOD RESPONSE: Concur. This is a Milestone B requirement.

RECOMMENDATION 2: Stage the timing of the DoD-wide TWV strategy so that it captures the knowledge gained during the year from the JLTV technology development phase, as well as from the decisions made on the HMMWV and MRAP programs.

DOD RESPONSE: Concur. The DoD-wide TWV strategy will not be limited to the JLTV, HMMWV and MRAP vehicles and will leverage the Army TWV Strategy to be released shortly.

RECOMMENDATION 3: Include in the DoD-wide TWV strategy "a cost-benefit analysis that could minimize the collective acquisition and support costs of the various TWV programs, and reduce the risk of unplanned overlap or duplication. Such cost-benefit analysis should provide an estimate of dollar saving for various options for offsetting JLTV quantities in favor of recapitalizing existing vehicles."

DOD RESPONSE: Concur. The JLTV program is conducting an Analysis of Alternatives that explores potential offsets to JLTV quantities. The analysis includes several studies that will be looking at the placement of MRAPs in authorized Brigades, further reducing the total requirement for JLTVs. The Army's TWV Strategy and TWV Acquisition Strategy report to Congress both recognize the recapitalization of existing vehicles is a major component of an affordable TWV Strategy.

GAO's Mission

The Government Accountability Office, the audit, evaluation, and investigative arm of Congress, exists to support Congress in meeting its constitutional responsibilities and to help improve the performance and accountability of the federal government for the American people. GAO examines the use of public funds; evaluates federal programs and policies; and provides analyses, recommendations, and other assistance to help Congress make informed oversight, policy, and funding decisions. GAO's commitment to good government is reflected in its core values of accountability, integrity, and reliability.

Obtaining Copies of GAO Reports and Testimony

The fastest and easiest way to obtain copies of GAO documents at no cost is through GAO's Web site (www.gao.gov). Each weekday afternoon, GAO posts on its Web site newly released reports, testimony, and correspondence. To have GAO e-mail you a list of newly posted products, go to www.gao.gov and select "E-mail Updates."

Order by Phone

The price of each GAO publication reflects GAO's actual cost of production and distribution and depends on the number of pages in the publication and whether the publication is printed in color or black and white. Pricing and ordering information is posted on GAO's Web site, http://www.gao.gov/ordering.htm.

Place orders by calling (202) 512-6000, toll free (866) 801-7077, or TDD (202) 512-2537.

Orders may be paid for using American Express, Discover Card, MasterCard, Visa, check, or money order. Call for additional information.

To Report Fraud, Waste, and Abuse in Federal Programs

Contact:

Web site: www.gao.gov/fraudnet/fraudnet.htm
E-mail: fraudnet@gao.gov
Automated answering system: (800) 424-5454 or (202) 512-7470

Congressional Relations

Ralph Dawn, Managing Director, dawnr@gao.gov, (202) 512-4400
U.S. Government Accountability Office, 441 G Street NW, Room 7125
Washington, DC 20548

Public Affairs

Chuck Young, Managing Director, youngc1@gao.gov, (202) 512-4800
U.S. Government Accountability Office, 441 G Street NW, Room 7149
Washington, DC 20548