

ON THE ROAD AGAIN

Joint venture model set for Land 121 protected light vehicle

■ Nick Merrett/CANBERRA

In light of its experience in Iraq and Afghanistan – via a burgeoning threat spectrum targeted against light (and lightly armoured) vehicle fleets – United States forces responded with a rapid technological development program and investment package resulting in the procurement of over 10,000 mine resistant/armoured protected (MRAP) vehicles.

Whilst initially speculated as drawing against funding put aside for a subsequent requirement to replace the bulk of the High Mobility Multipurpose Wheeled Vehicle (HMMWV, or 'Humvee') fleet, lessons learnt in executing first generation MRAP operations are now being devolved into a much larger Joint Light Tactical Vehicle (JLTV) program.

An initial industry briefing in July 2008 by US Army staff on the US Army/US Marine Corps Tactical Wheeled Vehicle fleet strategy forecast demand for the new light tactical vehicle class for the two US Services would be upwards of 160,000 vehicles. Phase 4 of Australia's project Land 121 in turn seeks to provide the ADF with a new protected mobility vehicle (PMV-L) capability, in the order of 1,100 vehicles.

Project 'Overlander' officials briefing ADBR in October indicated a strong view within the Defence Materiel Organisation (DMO), that the PMV-L requirement represented a timely opportunity for Australia to dovetail into an overseas military capability development program, as was similarly being structured for major aerospace acquisitions, such as the Joint Strike Fighter (Air 6000) and 'Global Hawk'/BAMS & AP-3C 'Orion' replacements (Air 7000).

Officials indicated progress to develop a framework to join the JLTV efforts was at an advanced stage, with US media re-



LOCKHEED MARTIN JLTV - ADBR PHOTO

Key Points

- **Defence officials are hopeful this week's** Land Warfare Conference will enable them to publicly confirm a good news story – progress in terms of advancing a \$314m acquisition of new unprotected light vehicles for the ADF.
- **Following the controversial decision to 'refresh'** the medium-heavy weight truck specification for phases 3A/3B of project Land 121, officials hope to quickly sign up Mercedes-Benz to supply 1,200 new Graz (Austria)-built 'G-Wagen' vehicles.
- **The Special Operations Command** is also scheduled next month to take delivery of their first batch of UK Supacat-built 'Nary' patrol vehicles, to replace the now well-worn fleet of Land Rover long-range patrol vehicles.
- **Defence's next task is to frame the acquisition** of a new fleet of protected light vehicles (phase 4 of project Land 121), with a draft proposal already in front of US officials for Australia to buy into the US Joint Light Tactical Vehicle (JLTV) program.

porting 1 October the contents of a US Army briefing pertaining to a 2010-2015 Pentagon funding package, which was said to include confirmation of an Australian Defence Force intention to contribute funds to PMV-L-type prototype technology development program, along with potentially the UK, Israel and Canada.

With over 18,000 up-armoured Humvees (with all kinds of armour kits) presently engaged in operations in Iraq (let alone other theatres), the JLTV program has been structured to begin replacing

such vehicles with initial US\$1.6b procurement of 1,385 vehicles and 755 trailers, from 2010 to 2015. US Defense authorisation documents indicate some \$315m has been included for research & development, with \$158m set aside for 127 new vehicles in 2013. Rolling forward, the US Army estimates it will spend between \$1-6 billion per year on the JLTV program.

The JLTV family will include five mission role vehicles ranging from the infantry combat variant, command vehicles, reconnaissance

vehicles and armoured utility vehicles. There are three primary variants, which are categorised by their payload and general mission, with further variations existing for special purposes within these three classes. These include: category 'A – Battlespace Awareness' vehicles, with a payload capacity of 1,600kg; category 'B – Force Application' vehicles, with a payload capacity of up to 2,000kg; and category 'C – Focussed Logistics' vehicles, with a payload of 2,300kg.

In addition to sporting a basic armour protection package and support for an add-on armour kit, the new vehicle is expected to be network-enabled, so is not only being required to provide power to on-board electronic components, but in an increasingly network centric force, will need to have the ability to export power to external systems. A special JLTV source evaluation Board under the auspices of the Army TACOM Life Cycle Management Command was expected this month to select three potential JLTV vehicle concept suppliers for further evaluation, under 27-month (Milestone A) development contracts.

Current declared aspirants for the JLTV opportunity include: Lockheed Martin Corporation; General Dynamics Corporation paired with 'Humvee' builder AM General; BAE Systems plc (producer of the Bradley Fighting Vehicle) and paired with Navistar International Corporation; Northrop Grumman Corporation and Oshkosh Corporation; Raytheon Company and Blackwater Worldwide; Boeing Company and Textron Incorporated; and Force Protection Incorporated with DRS Technologies Incorporated.

The intervention of the 4 November US presidential election, however, is likely to work to defer the down-select decision, now expected in early-2009, and falling in parallel with Rudd Government

consideration of the new Defence White Paper.

The original JLTV project schedule saw the program transitioning to a 'Milestone B' System Development Phase in FY2010-2011, with a production contract awarded by 2013. Officials close to the program consider that should the payload, protection and performance technologies prove ready at the end of what will now be an extended development phase, due to political considerations, the production time line could thus be accelerated.

Given firms are still awaiting the formal JLTV down-select, specific details of various company bids are sparse, however, Lockheed Martin (LM) reported 1 October its first two operational JLTV prototypes had successfully exceeded 25,000 combined miles of testing, more than half of which had been conducted off-road to simulate actual mission conditions. The infantry carrier 'Category B' model – with six-inch armour, MRAP level protection and side-mounted cameras – was unveiled in October 2007, while the Utility Vehicle Light 'Category C' model – designed with a focus on payload – began making appearances from February 2008.

Although noted for its commercial exposure to the US Army through missile programs (ie: MLRS) and warfighter information systems, the JLTV program represents one of Lockheed's first forays into traditional ground platforms – through its Systems Integration business in Owego, NY – albeit supported by a strong team of Pennsylvania-based small and medium-sized companies cen-

tered within the 12th Congressional District of representative John P Murtha, Chairman of the House Appropriations Subcommittee on Defense.

The company's third JLTV prototype – a 9-tonne, CH-47 'Chinook' helicopter-transportable, general-purpose mobility 'Category A' vehicle, has since been unveiled at the Association of the United States Army (AUSA) exhibition in Washington. LM has also drawn in BAE Systems-owned Armor Holdings for technology relating to JLTV development.

BAE Systems, of course, bought Armor Holdings (who had previously itself bought truck builder, Stewart & Stevenson) last year, and christened the conglomeration as its Mobility & Protection Systems division. A world away in Australia, the tie-up ended up being critical for BAES Australia in securing the medium-heavy truck requirement of phase 3A/3B of project Land 121, which – on the basis of unsatisfactory trials at Monegeetta and changing ADF armour requirements – has since (September 2008) been sent back to the drawing board for a specifications 'refresh' and re-tender in 2009.

BAE Systems is thus involved with a number of horses in the JLTV race, the other via a partnership with Navistar International Corporation-owned Navistar Defense, which pre-dated the Armor Holdings deal. Navistar Defense has been a major supplier of 'MaxxPro' vehicles into the Mine Resistant Ambush Protected (MRAP) program, raised to overcome deficiencies with the 'Humvee' experienced early in Operation 'Iraqi Freedom'. In

looking to a new generation of light tactical vehicles to replace the 'Humvee', US forces have been keen to regain lost payload, speed and manoeuvrability sacrificed in the up-armouring process.

Navistar Defense reported 3 October it had accordingly commenced production of a new International MaxxPro 'Dash' vehicle at its West Point (Mississippi) plant, with delivery of 822 units to be completed by February 2009. Designed for the unique conditions experienced by Coalition forces in Afghanistan, the 'Dash' is smaller and more mobile than the 'MaxxPro' MRAP, but retains the survivability system used on all MaxxPro MRAP variants, while also allowing for greater mobility in a smaller, lighter weight vehicle with a smaller turning radius and higher torque-to-weight ratio. A joint development with BAE Systems, Navistar Defence displayed the 'Dash' at AUSA in October, saying full production was scheduled to begin by mid-October.

BAE Systems also unveiled at AUSA 2008 its new 'Caiman Light' (CLT) vehicle – a five-man, 4x4 vehicle two-thirds the weight of the larger 18-ton 6x6 'Caiman' MRAP vehicle already deployed to Iraq and Afghanistan, and falling within the company's Family of Medium Tactical Vehicles (FMTV). The 'Caiman Light' comes standard with electronic stability controls, and can be built with rear steering – giving it a less-than 20-foot turning radius. The hull has transparent armour, a door-assist system and a turret. A full 85% of the CLT's parts (including engines, transmissions, power trains, tires and cabs) are common to the 'Caiman' and the

FMTV, thus offering significant reductions in logistics and operating/support costs in an overall more agile vehicle.

Oshkosh Truck (teamed with Northrop Grumman) reported 11 August it had tested a new suspension and diesel-electric propulsion for its 7-ton JLTV offering. The subject diesel-electric drive prototype eschews the traditional transmission/drive train in preference for a cable that connects to electric motors, hence providing designers with substantive freedom to adopt radical new approaches to cabin layout and crew comfort-ability.

The propulsion system is modular, meaning it could be easily converted or adjusted as technology (such as a hybrid-electric engine) dictates to other mobility platforms. The subject exportable power system hails from Oshkosh's previous work on the US Marine Corps Medium Tactical Vehicle Replacement (MTVR), with a number of units delivered last year, and configured to carry 21 kilowatts of exportable power.

Oshkosh says a new suspension – an upgraded version of the TAK-4 independent suspension that undergirds 10,000 US Marine Corps MTVR trucks (albeit several tons lighter) – is claimed to allow the prototype vehicle to move quite fast across open country, and hence, achieve the JLTV objective of 90 miles per hour. The power pack also drives the JLTV's planned suite of computers, electronics & C4ISR systems, and meets the Army's requirement for more than 30 kilowatts of exportable electrical power. Oshkosh is drawing for its armour technology upon collaborations with armour



JOINT STRIKE FIGHTER PARTNERSHIP MODEL FOR LAND 121/4: Higher capability (and hence costly) replacement platforms – in a scarce acquisition funding environment squeezed by the need to support operations and the re-setting of worn out equipment – are increasingly forcing the US armed services to pursue cooperative, or joint platform development programs. Australia might now have missed its opportunity to do this with the medium-heavy truck component of phase 3A/3B of project Land 121 – which is to be 'refreshed' with new specifications – however, the ADF is now ideally positioned to join collaborative programs on new combat and armoured vehicles just commencing their development cycles in the United States, and potentially, Europe.

LM JLTV & AVA-1 SPECIAL VEHICLE (far L and L), NAVISTAR JLTV (R) & KMW DINGO 2 (far R) - ADBR & VENDOR PHOTOS

specialists, Ceradyne and Israel-based Plasan Sasa.

As part of a strategic plan to grow its defence activities beyond its better-known private military contracting (PMC), Blackwater USA has teamed with Raytheon for the JLTV program, and unveiled 21 May a prototype six-passenger vehicle at the US Special Operations Industry Conference in Tampa, Florida. The partnership aims to combine the fast, off-road vehicle expertise of Blackwater amassed in supporting PMC operations, with the respected systems integration and C4ISR abilities of Raytheon.

The new vehicle incorporates appliqué armour (made by Ares Systems Group), uses add-on composite materials designed to provide more protection – on par with that provided for MRAP vehicles – but at a lower weight than traditional materials. The Blackwater-Raytheon JLTV concept is built with a power train designed by a NASCAR racing design team to both maximize speed (exceeding 75mph) and off-road ability, which is facilitated by an innovative dynamic hydraulic suspension system.

Forming a joint venture called General Tactical Vehicles, South Bend (Indiana)-based AM General and Michigan-based General Dynamics Land Systems unveiled their JLTV vision at the end of

September, at a Marine Corps Conference in Quantico, Virginia. Touting their vehicle as a next-generation ‘Humvee’ – but with greater payload and degrees of protection – the new JLTV prototype has a V-shaped hull, with the ability to add-on armour.

The vehicle is said to be “slightly larger” than the existing ‘Humvee’, but much heavier – ranging somewhere between combat vehicles like the ‘Stryker’ and current tactical wheeled vehicles. To overcome traditional ‘Humvee’ weaknesses experienced in Iraq, the new prototype has been provided with adjustable suspension to provide essential ground clearance, as needed.

Submitting their JLTV proposal 14 April, Textron Systems & Boeing confirmed Science Applications International Corporation had joined as a full team member. Other partners included Ford Motor Company (as a team subcontractor), MillenWorks (leveraging its off-road racing heritage) and Carlson Technology, for their pit-stop engineering for maintenance simplicity. No details of the armouring package have so far been released.

As the proposed prime contractor, Textron claims expertise in manufacturing armoured vehicles such as the M1117 Armored Security Vehicle (ASV), which is said to have achieved an average

operational readiness rate of more than 90% during the past year. SAIC provides systems engineering expertise and hybrid electric drive and technology integration capabilities for military ground vehicle applications. Boeing IDS is providing expertise in systems-of-systems platform and C4I integration, advanced vehicle electronics and CMMI Level 5 Systems Engineering.

DRS Technologies’ Sustainment Systems (TSS) and Force Protection Inc announced 26 February that DRS-TSS would serve as JLTV prime contractor, providing overall program management and system integration, and drawing upon its experience in developing and producing sub-systems and integrated solutions in ground mobility for the US military. Force Protection will design and produce the base vehicle, including the add-on armour package. The company had earlier (April) submitted its ‘Cheetah’ design for JLTV consideration under the ‘Milestone A’ Technology Demonstration Phase, but this was officially rejected 14 August.

German-based Krauss-Maffei Wegmann (KMW) and L-3 Communications Corporation confirmed 8 October a teaming to jointly develop and market a US version of KMW’s new F2 vehicle family, which they say will be targeted at meeting “the challenging requirements of the US forces for a future tactical armoured vehicle.” The scalable armoured F2US falls in the 10-24 tons weight classes, and is powered by two independent engines – the US version will be equipped with high technology subsystems from L-3 Communications.

Reflective of cost-minimisation imperatives, the main components and subsystems of the vehicle are proposed to be identical for the 3-crew 4x4- patrol version and 6x6 vehicle, which will have space for up to 11 crew members. A mobility concept derived from KMW’s ‘Fennek’ scout car is intended to permit the F2US to negotiate gradients of 60% and slide slopes of up to 30%, at a range of over 1,000km. The vehicle will also be equipped to withstand modern ballistic, mine and IED threats.

US Army officials note its future vehicle plans include a yet-to-be-determined mixture of recapitalised Humvees, next-generation Humvees (such as the Expanded Capacity Vehicle-2, or ECV-2), and JLTVs. Given the JLTV will not enter low-rate production until 2010 or 2011 at the earliest (with first deployments expected in 2012), ‘Humvee’ production is likely to transition to ECV-2. Accordingly, in 2009 and 2010 it proposes to spend \$4.5 billion buying more than 10,000 ‘Humvees’ and ECV-2s.

Rushing to incorporate lessons learnt from Iraq and Afghanistan, the ECV-2 is to be built to accept add-on armour and lightweight composites as they become available. The crew compartment is more spacious, the engine has been moved forward (and is computer-controlled for the first time), and the vehicle has been raised to run higher off the ground. The ECV-2 is to be ready in 2009 for contract modifications – and released for deployment by 2010 – thus taking the total Army fleet to approximately 141,000 light tactical vehicles, compared with around 120,000 at present.

Now undergoing Army testing, the 5- to 6-ton AM General-designed ECV-2 is designed to offer the same payload carrying capacity – 3,500 pounds – as existing ‘Humvees’ before the addition of extra armour reduced their cargo capacity. At about half the planned cost of JLTVs, ECV-2 purchases have been speculated as potentially replacing some JLTV orders.

With each JLTV expected to cost over US\$400,000 (and upwards depending on electronic fitouts), ECV-2 variants are being costed from \$133,000 to \$230,000, as against current M1151, M1152 and M1165 ‘Humvee’ prices between \$130,000 to \$170,000.



UK MoD PHOTO

XTMAS GOODIES FOR THE SPECIAL FORCES: Australia’s Special Operations Command is expected to receive its first batch of ‘Nary’ fast tactical vehicles in November. Made by UK-based Supacat, the Narys will replace the now well-worn fleet of Land Rover long-range patrol vehicles. UK special forces (above) have already used a similar version of the Supacat vehicle, dubbed the ‘Jackal’ in Afghanistan.