

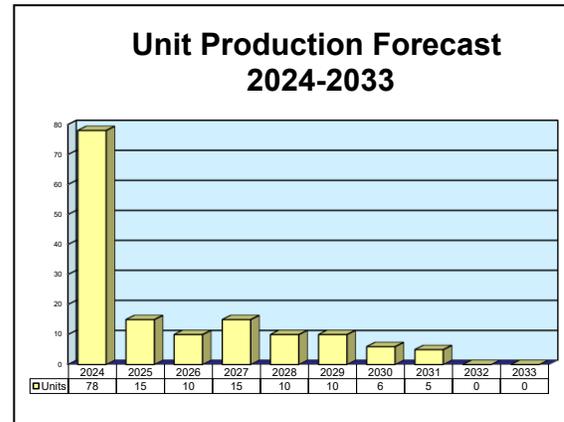
# ARCHIVED REPORT

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## Bushmaster

### Outlook

- Serial production of Bushmaster vehicles remains ongoing
- Bushmaster NZD5.5, produced by Thales Australia for New Zealand Army, under contract announced on July 8, 2020, by New Zealand Ministry of Defence
- Forecast reflects ongoing production for Australian Army procurement and possible export



### Orientation

**Description.** A 17-ton 4x4 wheeled armored vehicle.

**Sponsor.** The Australian Army sponsors this vehicle under the Bushranger Phase 2 development program.

**Status.** Development through serial production.

**Total Produced.** Through 2022, we estimate the prime contractor produced 1,585 Bushmaster vehicles.

**Application.** A wheeled armored personnel carrier optimized for long-range patrol missions.

**Price Range.** In 2023 U.S. dollars, the Bushmaster infantry mobility vehicle (IMV) carries an average unit price of \$1,363,200.

### Contractors

#### Prime

<b>Thales Australia, Armaments &amp; Ammunition</b>	<a href="http://www.thalesgroup.com">http://www.thalesgroup.com</a> , 7 Murray Rose Ave, Sydney Olympic Park, New South Wales, Australia, Tel: + 61 2 9562 3333, Email: <a href="mailto:communications@thalesgroup.com">communications@thalesgroup.com</a> , Prime
<b>Oshkosh Corp</b>	<a href="http://www.oshkoshcorp.com">http://www.oshkoshcorp.com</a> , 2307 Oregon St, PO Box 2566, Oshkosh, WI 54903-2566 United States, Tel: + 1 (920) 235-9150, Fax: + 1 (920) 233-9607, Email: <a href="mailto:jsalas@oshtruck.com">jsalas@oshtruck.com</a> , Licensee

#### Subcontractor

<b>Allison Transmission Division, General Motors Corp</b>	<a href="http://www.allisontransmission.com">http://www.allisontransmission.com</a> , One Allison Way, PO Box 894, Indianapolis, IN 46222-3271 United States, Tel: + 1 (317) 242-5000 (MD 3070 PT Automatic Gearbox)
<b>Caterpillar Inc</b>	<a href="http://www.caterpillar.com">http://www.caterpillar.com</a> , 501 Southwest Jefferson Ave, Peoria, IL 61630 United States, Tel: + 1 (309) 675-0545 (Model 3126 ATAAC Diesel Engine)

## Bushmaster

<b>Collins Aerospace Australia Pty Ltd</b>	http://www.collinsaerospace.com, 2-8 Allied Dr, Tullamarine, Victoria, Australia, Tel: + 61 3 8318 8000, Fax: + 61 3 8318 8002 (Rockwell 4000-Series Independent Suspension )
<b>Electro Optic Systems Holdings Ltd, Fire Control Systems Pty Ltd</b>	Suite 2, Level 12, 75 Elizabeth St, Sydney, NSW, Australia, Tel: + 61 61 2 9233 3915, Fax: + 61 61 2 9232 3411, Email: iandennis@eos-aus.com (Stabilized Remote Weapon System)

Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 75 Glen Road, Suite 302, Sandy Hook, CT 06482, USA; rich.pettibone@forecast1.com

## Technical Data

**Crew.** Two: commander and driver, plus seven fully equipped infantrymen.

**Configuration.** 4x4.

**Armor.** Monocoque, all-welded steel construction providing protection against 7.62mm ball rounds and ballistic fragments all around. The vehicle is also resistant to anti-personnel and many anti-vehicular land

**Dimensions.** The following data reflect the production-standard Bushmaster IMV (infantry mobility vehicle). Height is to the top of the hull.

	<u>SI Units</u>	<u>U.S. Units</u>
Length	7.02 m	23.03 ft
Width	2.50 m	8.20 ft
Height	2.65 m	8.69 ft
Combat weight	15 tonnes	16.54 tons
Fuel capacity	340 liters	89.83 gal

**Performance.** The automotive performance data reflect use on a paved road.

	<u>SI Units</u>	<u>U.S. Units</u>
Maximum speed	120 kmph	74.52 mph
Maximum range	1,005 km	624.20 stat mi
Step	47 cm	1.54 ft
Trench	65 cm	2.13 ft
Slope	40%	40%
Gradient	60%	60%
Fording	1.2 m	3.94 ft

**Engine.** Caterpillar Model 3126 ATAAC air-cooled, six-cylinder diesel engine. This supercharged and after-cooled engine generates 246 kilowatts (330 hp), with a power-to-weight ratio of 16.40 kilowatts per tonne (19.95 hp/ton). A 24-volt electrical system supports vehicle operations.

**Gearbox.** Allison Model 3126 ATAAC automatic transmission with one reverse and seven forward gears. The drivetrain features converter lockup in all gears and electronic control with flat-tow.

**Fire Control.** Not applicable.

**Suspension and Running Gear.** Rockwell 4000 series, independent coil spring/short-long wishbone-

mines. Available appliqué armor provides protection against 7.62mm armor-piercing projectiles.

**Design Features.** Specialized rugged-design vehicle optimized for extended operations in extremely harsh environmental conditions. The V-shaped body affords additional protection from land mines. The Bushmaster is air transportable via C-130 tactical transport aircraft.

type suspension system, with double-acting shock dampers at each wheel station. The vehicle features the Rockwell pneumatically operated all-wheel disc brake system, as well as 395/85 R20 XZL tires with a central tire inflation system. Power-assisted steering is standard.

**Armament.** One pintle-mounted 5.56x45mm NATO (.223 Remington) or 7.62x51mm NATO (.308 Winchester) machine gun at the forward hatch. Infantrymen can fire their individual weapons from the side openings of the hull. Three electrically operated smoke grenade launchers mount on each side of the hull.

**Bushmaster****Variants/Upgrades**

**Variants.** Thales Australia has developed the following Bushmaster IMV variants:

<b>Designation</b>	<b>Description</b>
Bushmaster	Basic 4x4 armored vehicle. See <b>Technical Data</b> , above.
Bushmaster Command and Control Variant	Command post derivative of the Bushmaster vehicle. Increased internal space allotted for radios and other communications equipment, laptops, a generator, and the storage of maps and intelligence information.
Bushmaster Self-Propelled Mortar Variant	Design proposal. Capable of carrying an 81mm mortar, 50 mortar rounds, and five passengers.
Bushmaster Direct Fire Variant	Direct Fire derivative of the Bushmaster vehicle. Variant is capable of mounting an RBS70 ground-to-air missile launcher along with an additional Javelin anti-armor missile system or 12.7mm heavy machine gun.
Bushmaster Pioneer	Engineering derivative of the Bushmaster vehicle. Increased internal and external storage space is allotted for engineering tools, work stations, and a generator. The variant is capable of carrying up to six engineers along with the vehicle crew.
Bushmaster Ambulance	Variant designed for the withdrawal of wounded patients from hazardous environments. Features a full medical suite and is capable of transporting one medical attendant, one stretcher, and up to four walking wounded along with the vehicle crew. Foldable seating allows for the creation of a second stretcher position as required. Operated by the Australian Army and Royal Australian Air Force.
World Bushmaster	Design proposal for export variant of the Bushmaster.
Bushmaster Single-Cab Utility Variant	Protected logistics variant operated by the Australian Army. Features an armored three-man cab and a 9.4-square-meter flatbed rear, with a 5-tonne (5.5-ton) cargo capacity. Also features an 8-tonne (8.8-ton) towing capacity.
Bushmaster Interrogation Arm Variant	Variant operated by the Royal Netherlands Army that mounts an interrogation arm, camera, and metal detector used for the remote inspection of suspicious objects and potential improvised explosive devices (IEDs).
Bushmaster SPARK Variant	Variant operated by the Australian Army and developed as part of Project NINGAUI. Mounts a Self-Protection Adaptive Roller Kit (SPARK) Mine Roller Mk 2 for the detection and disposal of IED and mine threats.
Bushmaster Dual-Cab Utility Variant	Variant operated by the Australian Army to provide logistical support in hazardous environments. Features a four-man armored cab and 5.2-square-meter flatbed rear with a 6.7-tonne (6.6-ton) carrying capacity.
Bushmaster ISTAR Osprey	Variant designed for ISTAR (intelligence, surveillance, target acquisition, and reconnaissance) operations. Vehicle mounts a Will-Burt Stiletto mast with integrated Thales UK laser rangefinding and SOPHIE MF thermal imaging technology.

**Modernization and Retrofit Overview.** Thales has introduced a number of upgrade and retrofit packages for the Bushmaster family of vehicles.

**SRWS.** The integration of Stabilized Remote Weapons Systems with the Bushmaster is among the most critical

and widely implemented of the available upgrade options.

In 2006, the Australian Army pursued mounting an SRWS on the Bushmaster in response to feedback from troops in Iraq and Afghanistan. Bushmaster crews were

## Bushmaster

dissatisfied with the scant level of armored protection for soldiers operating the pintle-mounted machine gun.

In response, the Australian Defence Materiel Organization (DMO) launched a program for rapid procurement of an SRWS for the Army's Bushmaster fleet. After a brief trial period, the DMO chose the EOS Raven R-400 (M101 CROWS) SRWS and placed an initial order for 44 systems for immediate delivery to Australian forces in Afghanistan.

Later that same year, the Royal Netherlands Army (RNLA) purchased 12 SWARM remote weapons systems (by Thales UK) in tandem with its first order for Bushmaster vehicles.

In 2007, the RNLA purchased 17 EOS R-400 systems through Thales Australia, with an additional procurement in 2009.

The British Army equipped several of its Bushmaster vehicles with the Protector series SRWS. The system is designed by Norwegian company Kongsberg, but is produced under license by Thales UK for domestic customers.

The most common weapon to be integrated with remote weapons systems on Bushmaster vehicles is the .50-

caliber Browning M2 machine gun. However, the Australian Army has largely opted to integrate the FN MAG M240 7.62mm machine gun on its Bushmaster fleet.

**SOTAS IP.** In 2009, the Australian Defence Force (ADF) began retrofitting its Bushmaster fleet with the Thales SOTAS IP integrated vehicle communication system.

SOTAS IP bundles multiple communications platforms (intercom, radio, VoIP, and command post networks) into a single MIL-SPEC system. These linkages provide crews with extensive connectivity to nearby forces and the chain of command. The RNLA has also equipped its Bushmaster fleet with the SOTAS IP system.

**Blast Protection.** In 2011, the Australian Ministry of Defence issued a survivability upgrade package for all Bushmaster vehicles deployed in Afghanistan. The package integrates new flooring and an elevated seating configuration in the Bushmaster's cabin, and is designed to lessen the physical trauma of an IED blast for the vehicle's passengers and crew.

The package was developed by Thales Australia, working in collaboration with Stratos Seating.



Bushmaster IMV in Iraq

Source: Australian Department of Defence

## Program Review

**Background.** In the early 1990s, the Australian Department of Defence initiated the two-phase Bushranger (Land 116) program to field an infantry mobility vehicle. In 1994, the Australian DoD awarded British Aerospace Australia a contract for 268 Perentie

vehicles (based on the Land Rover chassis) to meet the Phase 1 (light vehicle) Bushranger requirement. Subsequently, Tenix Defence acquired British Aerospace Australia.

## Bushmaster

### *Bushranger Phase 2*

For the more ambitious Phase 2 of the Bushranger program, the Australian DoD ultimately selected the Perry Engineering Bushmaster design after evaluating 17 contenders. Timoney Technology of Ireland and Stewart & Stevenson of the United States both contributed to development of the Bushmaster. In 1997, Australian Defence Industries (ADI) purchased the initial prototype of the Bushmaster and continued its development.

In February 1998, ADI submitted its required three prototype Bushmaster vehicles to the Australian Army for the 44-month competitive evaluation program. In March 1999, the Australian Army formally selected the Bushmaster IMV for the Bushranger Phase 2 requirement. On June 1, 1999, the Australian Department of Defence made the official contract announcement. The Australian Army stated an initial procurement objective of 299 vehicles.

### *Shaky First Steps*

In October 1999, as part of an extended operational evaluation, the Australian Army deployed two preproduction Bushmaster vehicles with the Australian peacekeeping forces operating in East Timor. Published reports in early 2000 stated that the Bushmaster exhibited reliability problems during this deployment. It came as no surprise that preproduction systems suffered their share of problems in such an environment. Indeed, some reports indicated that the problems were related to training. In one incident, a driver simply drove the vehicle onto terrain that it was not designed to traverse.

Initial production deliveries occurred in mid-2001. However, the perceived problems of the East Timor deployment led to a suspension of deliveries in August 2001. By mid-2004, the program was reportedly back on track. Serial production is ongoing.

### *Trial by Fire*

The Bushmaster's first major field deployment after East Timor was in 2005, when the Australian Defence Force deployed 10 vehicles to southern Iraq. Later that same year, the Australian Special Task Forces Group deployed Bushmaster vehicles to Afghanistan.

The Bushmaster performed well in both initial deployments. Its design proved well suited to the asymmetric combat environments of Iraq and Afghanistan. The ADF has since embraced the Bushmaster as its primary armored transport vehicle.

The Bushmaster has secured two foreign buyers since its introduction. In 2006, the Royal Netherlands Army purchased 26 Bushmaster vehicles in response to the

urgent need of Dutch troops in Afghanistan for vehicles with enhanced protection from mine and IED threats.

The requirement was so pressing that the first batch of vehicles was delivered directly to Dutch forces in Afghanistan, necessitating that the vehicles be completely outfitted upon their arrival in country. The RNLA currently operates 86 Bushmaster vehicles.

The British Army procured a single order of 24 vehicles in 2008, initially for use in Iraq.

### *Corporate Evolution*

In October 2006, the Thales Group (Neuilly-sur-Seine, France) acquired ADI Ltd. The Australian contractor now operates as Thales Australia.

**Description.** The monocoque steel-alloy construction of the Bushmaster IMV, along with the basic V design of the hull, affords excellent protection against the effects of small arms fire and landmines.

### *Conventional Layout*

The vehicle exhibits a conventional layout. The engine mounts in the front of the vehicle; the crew compartment occupies the space immediately to the rear. The crew compartment – with the driver sitting on the right and the commander on the left – features a large windscreen and side windows, providing a high degree of visibility.

The troop compartment in the rear features three windows with armored shutters on each side, plus five roof hatches. The forward roof hatch provides access to a pintle-mounted machine gun on the vehicle roof. A rear door provides primary troop access/egress. The embarked infantrymen can fire their individual weapons from the side openings on each side of the hull.

### *Ready to Cruise the Outback*

The Bushmaster IMV is optimized for extended operations in harsh (hot and dry) environmental conditions. The vehicle features a split-type high-capacity air conditioning system and extensive insulation, as well as a large-capacity (270-liter / 71.8-gal) cooled drinking water system. The vehicle provides an extensive storage area for equipment and personal equipment.

The contractor designed the vehicle's systems for ease of operation and maintenance. The central tire inflation system features four operating settings; the vehicle carries two spare tires. The Bushmaster IMV also features a hydraulically operated 10-tonne (11.02-ton) winch mounted on the left side of the hull. The crew can also mount this winch on the front or rear of the vehicle as needed.

## Bushmaster

### Funding

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The Australian Department of Defence, through the Australian Army, funds the Bushmaster IMV as part of the Bushranger Phase 2 program.

### Worldwide Distribution/Inventories

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**Export Potential.** The entire Bushranger Phase 2 program has generated a good deal of interest in the international armored vehicle community; several potential customers – including the United Arab Emirates – have expressed serious interest. Although the Bushmaster IMV is clearly a specialized vehicle design, it holds considerable potential for export sales to nations operating in the Middle East.

In July 2006, the Netherlands became the first export customer for the Bushmaster IMV with a procurement of 26 vehicles for immediate deployment to Afghanistan. The RNLA subsequently placed three follow-on orders for an additional 72 vehicles.

In May 2008, the United Kingdom officially joined the Bushmaster club when the U.K. Ministry of Defence publicly acknowledged reports of the procurement of Bushmaster vehicles for service in Afghanistan.

In March 2014, the Japan Ministry of Defense awarded Thales Australia a contract worth \$9 million for four Bushmaster vehicles.

Jamaica ordered 12 Bushmaster vehicles. In addition, Indonesia reportedly procured three Bushmasters.

**Countries.** **Australia** (1,294, with an additional 173 on order); **Indonesia** (3); **Jamaica** (12); **Japan** (4); the **Netherlands** (98); and the **United Kingdom** (24).

### Forecast Rationale

In May 2023, the Australian Army placed its most recent follow-on order, worth AUD160 million (\$106 million), for 78 additional Bushmaster vehicles.

To date, the Australian Department of Defence has placed orders for an additional 1,052 Bushmasters beyond the original procurement of 299 vehicles.

In June 2013, Thales Australia announced the rollout of the 1,000th Bushmaster from the production line.

#### Realizing Its Potential?

With the emergence of asymmetric combat environments worldwide, vehicles featuring enhanced survivability against hostile fire and improvised explosive devices (IEDs) have become hot items on the international market.

To date, the Netherlands and the U.K. have procured the Bushmaster in quantity. In addition, Indonesia, Jamaica, and Japan have procured limited numbers of Bushmaster vehicles, while still more secondhand units

have been transferred to Ukraine to aid Ukrainian ground forces in their battle against invading Russian forces.

Although available evidence indicates that the current production-standard Bushmaster IMV lives up to the contractor's claims, the fact remains that only a limited number of these vehicles have been exported.

Nevertheless, the Bushmaster remains a solid success with the Australian armed forces. Given that the Australian Army has always been the primary customer for the Bushmaster, this may be good enough for Thales Australia.

Forecast International anticipates modest orders in the forward five-year period as Canberra may wish to keep local production lines running by purchasing top-up units for the Australian Army. The possibility of further small-batch export orders also exists as the Bushmaster is a proven vehicle already purchased by Australian allies.

**Bushmaster**

**Ten-Year Outlook**

<b>ESTIMATED CALENDAR YEAR UNIT PRODUCTION</b>												
<b>Designation or Program</b>		<b>High Confidence</b>				<b>Good Confidence</b>			<b>Speculative</b>			
	<b>Thru 2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>	<b>2031</b>	<b>2032</b>	<b>2033</b>	<b>Total</b>
<b>Thales Australia</b>												
<b>Bushmaster</b>												
	1,199	78	15	10	15	10	10	6	5	0	0	149
<b>Total</b>	1,199	78	15	10	15	10	10	6	5	0	0	149