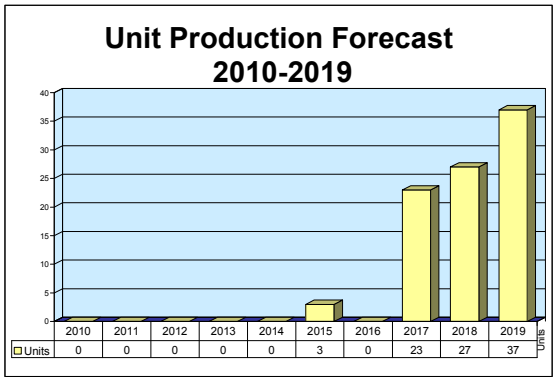
Bell MAPL

Outlook

- The MAPL program conceived to give high levels of commonality across Bell's new helicopter models
- Integrating new technologies into product line is key aspect of the program
- New Medium Twin seating 16-17 passengers is the aircraft likely to emerge next from MAPL program



Orientation

Description. Family of light, single- and twin-engine, single-rotor helicopters being designed by Bell Helicopter Textron.

Sponsor. Privately sponsored by Bell Helicopter Textron, Mirabel, Quebec, Canada.

Status. Preliminary designs only.

Total Produced. None

Application. Intended for a wide range of civil/ commercial applications; possible development of military derivatives.

Price Range. Estimated prices are $1-$1.5 million for the New Light Single and $13.0 million for New Medium Twin, in 2010 dollars.

Contractors

Prime

Bell Helicopter Textron Canada Ltd	http://www.bellhelicopter.com, 12 800 rue de l'Avenir, Mirabel, J7J 1R4 Quebec, Canada, Tel: + 1 (450) 437-3400, Fax: + 1 (450) 437-6010, Prime (Development)

Comprehensive information on Contractors can be found in Forecast International's "International Contractors" series. For a detailed description, go to www.forecastinternational.com (see Products & Samples/Governments & Industries) or call + 1 (203) 426-0800.

Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 22 Commerce Road, Newtown, CT 06470, USA; rich.pettibone@forecast1.com

Technical Data

Design Features. Very few details available. Aircraft to feature protected, low-noise anti-torque tail fan in lieu of conventional tail rotor.

Bell MAPL

Variants/Upgrades

New Light Single/Model 351. Originally expected to be the first to appear, this would be a single-engine design seating five passengers. This was described as the successor to the 206B-3 JetRanger. Initially known as the Model 351, Bell appears to have dropped that designation without replacing it with another. For purposes of this report, it is now referred to by Forecast International as the "New Light Single."

Model 381. Single-engine, eight-passenger model, possibly a stretched variant of the Model 351, above. This would replace the 206L-4 LongRanger.

Model 382. Twin-engine, eight-passenger model, reportedly to share some of the technology under development for Bell's IFR-capable Model 429 light twin.

New Medium Twin. Several designs are under consideration for a new twin seating 16 or 17 passengers that would compete with AgustaWestland's successful AW139 program. This design has been receiving the most emphasis by the manufacturer. Based on reports of customer briefings, the initial design envisions a 15-18 seat aircraft with a maximum takeoff weight of 18,000-20,000 pounds (39,600-44,000 kg) and a useful load of 7,500-8,500 pounds (16,500-18,700 kg).

Program Review

Background. Bell began developing the technology for a new Modular Affordable Product Line (MAPL) of light single- and twin-engine helicopters in 2003, noting that it planned to begin deliveries of the new models at or by the end of the decade.

Original plans called for MAPL aircraft to be produced in three sizes: the five-passenger, single-engine 351; an eight-passenger single called the 381; and a twin-engine, eight-passenger variant known as the 382. Bell originally said the Model 382 would incorporate some of the technology developed for the IFR-rated 427i, but that model was subsequently dropped in favor of the more ambitious Model 429 which, in fact, will feature some of the enhancements derived from the initial MAPL research.

Modular Design Approach

Designed at the lower end of the market to fill a perceived gap between the Robinson R44 and Bell's own 206, the smallest MAPL variants would be priced between $500,000 and $1 million. Finding that customers overwhelmingly base their buying decisions on price, Bell intends to pursue a modular design, theoretically keeping manufacturing costs in check through use of the same components across the various models.

Additional cost benefits would come from a 20 percent improvement in speed and useful-load capacity and a 99 percent dispatch reliability target. Bell also hopes to cut external noise by 10 dB. All told, the company is targeting a 20 percent drop in operating costs.

Bell has thus far focused its R&D spending on improvements to the main rotor, drivetrain, autopilot, and noise control. Engine improvements under study by Pratt & Whitney Canada, Turbomeca, and Honeywell would account for the balance of the improvements. Current customers will also benefit from the new technologies, as Bell plans to add MAPL improvements to existing products.

Tail Fan Demonstrator Makes First Flight

In July 2004, Bell's MAPL tail fan demonstrator flew for the first time at the company's research center in Arlington, Texas. Plans called for the demonstrator to explore the flight characteristics of this protected, low-noise anti-torque device, intended for use on the MAPL light helicopters.

In 2005, however, Bell dropped the tail fan concept in favor of what it described as a breakthrough technology, the propulsive anti-torque system (PATS), which the company developed for the now-defunct Unmanned Combat Armed Rotorcraft (UCAR).

Higher Speeds Sought

The PATS replaces conventional tail rotors and tail fans with high-bypass engine power that can add as much as 40 knots of dash speed while filling anti-torque requirements. The system is intended to break the so-called speed barrier for conventional helicopter designs, which currently limits light single-engine helos to max speeds of 135 to 140 knots.

New Medium Twin

As described in **Variants/Upgrades** above, this is the design Bell is currently emphasizing. Several design configurations are reportedly under consideration to seat 16 or 17 passengers. According to statements made by Bell in April 2006, the New Medium Twin (NMT) is the next aircraft to be developed in the MAPL sequence

after the Model 429 light twin. Certification of the NMT was projected at "around the start of the decade," but there has been no indication that Bell is about to launch the program.

Funding

Funded by Bell and the Canadian government.

Timetable

Month	Year	Major Development
	2003	Preliminary design, technology evaluation
Mar	2004	MAPL family announced
Jul	2004	MAPL tail fan demonstrator first flight
Early	2005	Tail fan configuration replaced by PATS

Forecast Rationale

The Modular Affordable Product Line (MAPL) program was not often in the news during 2008-09. Years ago, Bell's management conceived of the MAPL program as a way for Bell to regain the initiative against arch-rival Eurocopter and improve the level of technical innovation in its product line. The MAPL program could allow the company to add new technologies to its helicopters in a cost-efficient way by amortizing the costs of developing new technology and systems across its product line.

Bell underwent a change in leadership during June 2007 when Mike Redenbaugh was replaced at the helm of Bell by Richard Millman. Millman retired in late July 2009 and was in turn replaced by John Garrison. Garrison was a top executive at Bell's corporate parent, Textron, prior to moving to Bell. He did not come up through the ranks at Bell, and it is not clear whether Garrison is as interested in the philosophy of commonality underlying the MAPL program as his predecessors. The program may well languish in years to come if Bell's management focuses its attention elsewhere.

The twin-engine, seven-passenger 429 was the first aircraft to benefit from the MAPL program. Bell says that the 429 program has integrated a number of MAPL technologies, but it is not a MAPL program aircraft. The first helicopter to emerge from the MAPL program is likely to be a new twin-engine aircraft.

The configuration of this aircraft, often referred to by Bell as the New Medium Twin (a designation we have adopted for our forecast) or lately, the "New Medium Product"), is still under review, but reports of customer briefings indicate that the aircraft will seat 15-18 and have a maximum takeoff weight in the area of 18,000-20,000 pounds (39,600-44,000 kg). It is possible that it will be even larger and reach the 19-20 seat category. The new model would thus be targeted at the space between AgustaWestland's popular AW139 on the low end, the Eurocopter EC 225, and Sikorsky S-92 on the high end.

This would be a larger design than any of the three originally described by the manufacturer when it first launched the MAPL project. Bell originally said that the MAPL family would fill the perceived product gap between the single-engine, piston-powered R22 and Bell's own Model 206 series. This would have placed the program's focus on the lower end of the turbine market where Bell desperately needs a shot of new technology, but that plan appears to have fallen out of favor.

Based on earlier Bell statements, the first flight of a full-blown prototype/demonstrator to replace the JetRanger was expected to occur in the 2007-2008 timeframe, with certification around 2008. Since then, Robinson has decided to enter the light single-engine turbine market with its upcoming R66, and Schweizer decided to introduce the new 434 model. Competition at the lowest rung of the turbine market is growing intense, and Bell has not indicated any movement in the direction of creating a new model targeted at the low end of the turbine segment. Development of the New Light Single must be considered a long-term project rather than a near-term goal.

Bell MAPL

Ten-Year Outlook

ESTIMATED CALENDAR YEAR UNIT PRODUCTION												
Designation or Program		High Confidence				Good Confidence			Speculative			
	Thru 2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Bell Helicopter Textron Inc												
MAPL New Light Single <> MAPL NLS engine												
	0	0	0	0	0	0	0	0	3	0	8	11
MAPL New Medium Twin <> MAPL NMT engine												
	0	0	0	0	0	0	3	0	20	27	29	79
Subtotal	0	0	0	0	0	0	3	0	23	27	37	90
Total	0	0	0	0	0	0	3	0	23	27	37	90