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Digital Drive

Army Confident Latest Bradley Replacement Won't Stall

BY LAURA HECKMANN

N OVI, Michigan — The XM30 Mechanized Infantry Combat Vehicle is the latest in the Army's long line of attempts to replace its M2 Bradley infantry fighting vehicle, first fielded in the 1980s.

The service is confident its latest effort — after decades of dysfunctional design and development — can drive by the mistakes of the past.

Formerly known as the Optionally Manned Fighting Vehicle, the XM30 follows most recently the Army's Ground Combat Vehicle and before that it was part of the scrapped Future Combat System program, but is actually the service's sixth attempt to replace the Bradley, said Col. Jeffery Jurand, project manager for the XM30.

The M2 Bradley has been in use since 1981 as a fighting vehicle used to transport infantry on the battlefield and provide support to dismounted troops. More than 40 years later, the aging vehicle can no longer keep up with the demands of modern warfare, but replacing it has proved as tumultuous as its original development.

Previous programs have fallen prey to what a Congressional Research Service report published in March described as “programmatically and cost-associated reasons.”

Jurand said in an interview that programs will struggle if four things aren't aligned: requirements, funding, technology and schedule.

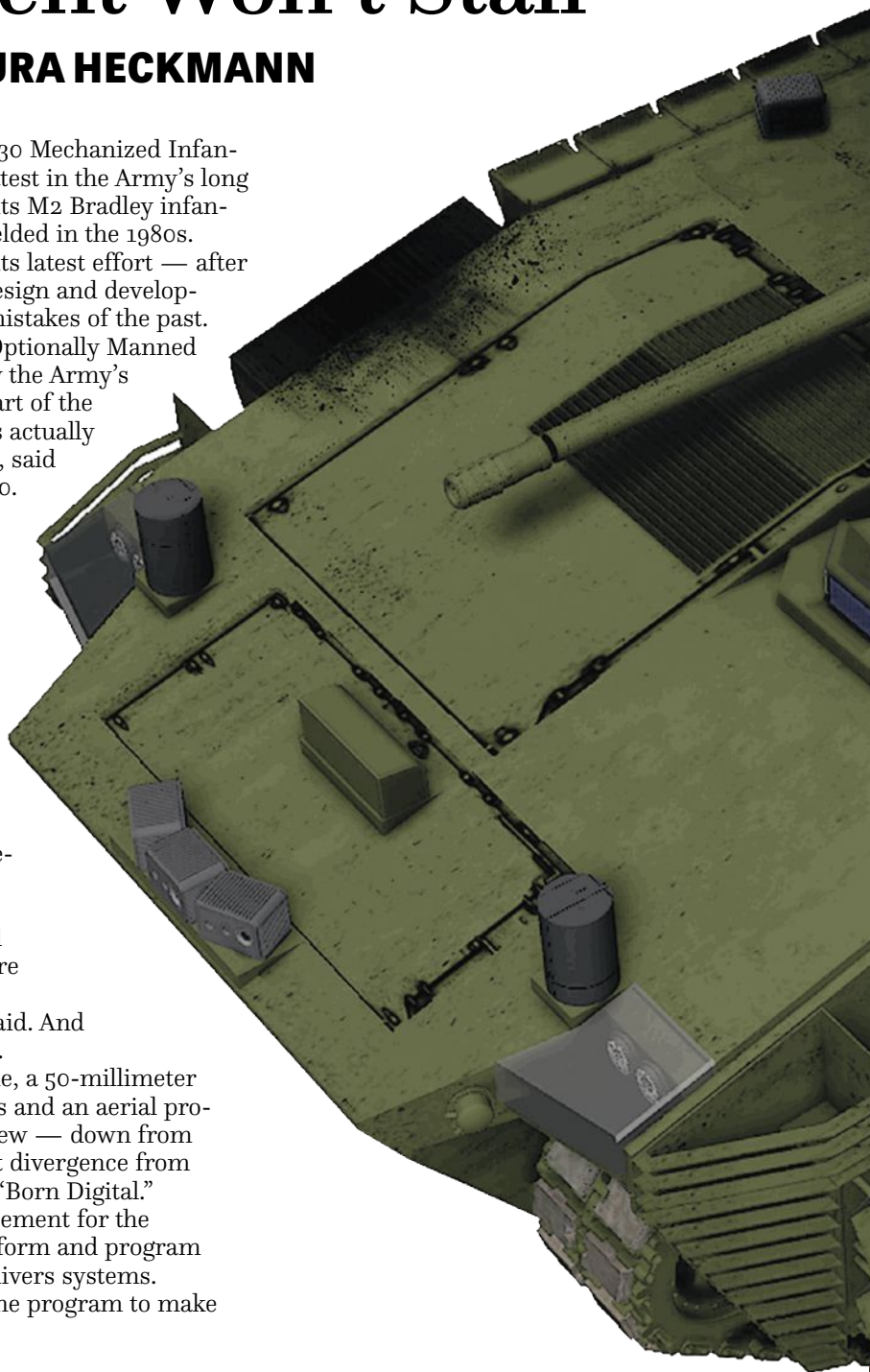
“And you can go back and probably look at the Future Combat System program and the Ground Combat Vehicle program and point to one or more of those four being out of alignment,” he said.

The XM30 program is aligned on all four, he said. And they're connected by a thread — a digital thread.

The vehicle will feature a hybrid-electric engine, a 50-millimeter cannon, anti-tank guided missiles, machine guns and an aerial protection system and operate with a two-person crew — down from the three required for the Bradley. But its biggest divergence from its aging predecessor is embedded in its slogan: “Born Digital.”

The platform is not just an evolutionary replacement for the Bradley, Jurand said. It's a transformational platform and program that will change the way the Army builds and delivers systems.

For example, digital engineering has allowed the program to make



Army rendering, Army photo



**LEFT: XM30 rendering
BELOW: M2 Bradley**

requirements more achievable — something Jurand said has been a focus of the program from the beginning.

Individually, each requirement has to be achievable, but together, they also have to form a platform senior leaders can operationally employ, he said. With the Ground Combat Vehicle program, individual requirements were achievable, but “when you added them together, you ended up with a vehicle that was 70 tons — absolutely massive platform — and senior leaders took a look at it and said, ‘Wow, this is really just too large of a platform to reasonably employ in an operational environment,’ and that’s one of the reasons why the [GCV] program had a very short life.”

For the XM30, the Army spent \$300 million avoiding those mistakes, bringing in five contractors to do digital designs, he said. Each contractor was given around \$60 million and a 15- to 18-month design phase to provide representations of the vehicles that emulated draft requirements issued by the Army.

Requirements were refined through three or four iterations in a digital model space across the five vendors, Jurand said. “That was really, really powerful because you could start to see a normalization of the requirements as the vendors ... would tell you, ‘These requirements aren’t doable,’ but if another vendor could pull it off, you ultimately said, ‘Well, I think it’s actually a reasonable requirement.’”

Mike Milner, vice president for business development and strategy at American Rheinmetall Vehicles — one of two vendors downselected for prototype contracts in June 2023 — said the Army has done “an incredible job” with the program and its openness with industry “is going to be the critical thing that’s going to make the program successful.”

The Army has been “very responsive” to vendor feedback. “If we can show them with facts why something doesn’t work that way, they’re like, ‘Oh, OK. Got it.’ And they’ve adapted the requirements to that,” he said on the sidelines of the National Defense Industrial Association Michigan Chapter’s Ground Vehicle Systems



Soldiers participate in a virtual experiment to provide input on possible crew configurations for the XM30 Combat Vehicle.

Engineering and Technology Symposium and Modernization Update.

Young Bang, the Army’s principal deputy assistant secretary for acquisition, logistics and technology, agreed that improved communication with industry will be instrumental to the program’s success.

“The Defense Department in general, and the Army, used to just put out a request for information that was a draft performance work statement, industry putting very specific questions about that and then went right to the request for quote,” Bang told *National Defense*.

“We’re augmenting that with just saying, ‘Hey, we’re thinking about this strategy. What’s your feedback?’ Or ‘We’re thinking about this standard. What’s your feedback?’ And we’re incorporating those types of feedback even before it gets to the draft” performance work statement, he said.

“We have better communications and negotiations discussions” with industry. “I think we’re learning together. I think that’s a big difference,” Bang said during a panel discussion.

Learning the digital world together has been both a strength and a challenge for the program. James Mason, XM30 prototype development team engineer, called this digital environment a “brave new world” with foreign systems to learn and a workforce in need of training.

The Army and industry are “working through this brave new world together, and hey, we don’t have a template to point to. We don’t have a standard, so we’re working through this together,” Mason said during a panel. “It’s not one class. You have to keep working through it. There’s a lot of different aspects to it. There’s [sys-

tems modeling language], there’s [models-based systems engineering], there’s digital threads, and those kind of all work together, and you need good training to work through all of that.”

The XM30 is one of six designated pathfinder programs named in a recently released Army strategy intended to demonstrate the benefits of digital engineering. Other programs include the Future Long-Range Assault Aircraft and M113 Armored Personnel Carrier.

Jurand said the program has adopted the term “digital trinity,” referring to its utilization of models-based systems engineering, digital engineering and development, security and operations, or DevSecOps.

Both contractors have been directed to develop software in a government-owned DevSecOps environment — a framework that integrates security into all phases of the software development lifecycle, he said during a panel.

Models-based systems engineering is a method of digital engineering that uses visual models to represent a system’s requirements, design and architecture throughout its development lifecycle.

Frank Wojcik, engineering branch chief for XM30 prototype development, said during a panel that models-based systems engineering has allowed the program to link what had previously been PowerPoints, spreadsheets and PDFs into an online model with one big perk: traceability.

“What models-based systems engineering has allowed us to do is make those linkages within the model, and then it allows for other people to come along later and view that and get up to speed quickly on where the program is and where it’s going,” he said.

Mason added that “the traceability is where the power of this really comes through,” eliminating hours of digging through documents and slides searching for the weak link in a failed test.

Jurand said the models-based methodology also “allows you to provide additional context in behavioral diagrams that absolutely will make a difference in software development. Because of the models-based approach and the deliverables that we receive every three weeks from both of our contractors, we’ve been

able to find errors ... before purchase orders have been issued.”

If programs are able to move toward a more open architecture, “and you combine that with the models-based approach, you’ve now put in the knowledge necessary to actually integrate software onto a platform or a capability that we’ve never been able to do before,” he said.

Jennifer Swanson, deputy assistant secretary of the Army for data, engineering and software, said the digital environment also brings “a lot to the table” from a sustainment perspective. “Obsolescence is a problem for every program. Digital engineering will be able to really help us get ahead of that.” Additive manufacturing is something “we really want to be able to accelerate, and digital engineering environments will help us to do that. So, I think that there is a huge increase in the success factor,” she said.

The program’s digital roots have also brought confidence to an area that has proven a pitfall for previous programs: funding. Jurand said he is “very comfortable with where we’re at.” Public support from Secretary of the Army Christine Wormuth has instilled confidence in the program, he said.

Senior Army leaders “understand its importance, not just to replace the Bradley, but also the open architecture that it brings, which has cost savings in the future, and the fact that we’re one of the digital pathfinder programs helping the Army transition how we do all this digital stuff,” he said. Service leaders “recognize the value of the program and have aligned the necessary resources to see it through to completion.”

Jurand said he is “very encouraged at this point,” but the program will need to continue hitting its marks and delivering on its promises to maintain the support of senior leaders and Congress.

The next mark will be critical design review, with the program currently in phase three of a five-phase schedule. The remaining two vendors — American Rheinmetall Vehicles and General Dynamics Land Systems — recently concluded preliminary design reviews and both aim to deliver critical design reviews by the end of the year.

The Army will conduct critical design reviews in the first half of fiscal year 2025, Jurand said, “which is where we lock what’s called the product baseline. All the drawings are complete and we’re about ready to go build

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prototypes” which “culminates the major design activity for the program.”

Following the critical design reviews will be an 18-month period where the vendors build prototypes to be delivered “starting in the fourth quarter of 2026” for testing and evaluation, he said.

As for when a single vendor will be chosen, Jurand said the current plan is to issue the final request for proposal for the production contracts to the two vendors once testing begins “and within that contract, it will contain the downselect criteria about how we’re going to determine the winner,” with a decision coming “right about [the] first quarter of fiscal year 2028.”

“XM30 is transformational in more than one way,” Jurand said. “We’re looking forward to seeing it.”

National Defense spoke to a representative from General Dynamics Land Systems who was unable to provide details about the company’s role in the program and declined to be named. Both contractors declined to provide details on specific features of their offerings, or images of their latest prototypes. **ND**

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