Problem Statement

The Army Technology Readiness Level (TRL) system does not effectively operationalize non-critical, soldier-developed hardware within acceptable fielding timelines (less than one year) (Office, n.d.). While the Middle Tier Acquisition (MTA) and Other Transaction Authority (OTA) frameworks provide expedited pathways (two to five years), these processes are not codified for in-house soldier initiatives (Nesaw, 2025). This approach requires significant time and financial resources, and neither framework adequately addresses real-time warfighter needs. Manufacturing processes that lack experienced soldier input often yield products that do not meet the relevant form factors or key performance parameters. The potential contributions of universities as Non-Traditional Performers in capability development remain underutilized.

Rapid Acquisition Limitations

MTA has two established pathways under DoDI 5000.80. Rapid Prototyping (RP) is the development and demonstration of fieldable prototypes in an operational setting. RP technologies must start at TRL 5-7 and do not require Joint Requirements Oversight Council (JROC) validation (requirements are now validated at the service level) (SECWAR Hegseth & Feinberg, 2025). Rapid Fielding (RF) is the expedited production of proven technologies that require minimal additional development. RF capabilities must be at TRL 8+, and production must start within 6 months. MTA's design is to deliver within 5 years for both avenues. (Audit of Department of Defense Middle Tier of Acquisition Rapid Prototyping and Rapid Fielding Programs (DODIG-2021-131), n.d.)

The 'Valley of Death' (TRL 4-6) represents the most challenging phase of capability development within the defense innovation sector. During this period, concepts have progressed beyond laboratory simulations or bench tests and are advancing through successive echelons toward established benchmarks. Factors such as re-competing requirements tied to fiscal-year funding, delays in Traditional Defense Laboratory testing and evaluation, and misalignment with development partners significantly increase the risk that a product will fail to meet sustainable deadlines or be discontinued.

Products from industry that weather this process often still miss the intended design scope due to loss of relevance (lengthy timelines), survivability disconnect (exposed cables, non-environmentally resistant batteries), and siloed manufacturing (built by engineers, not soldiers). Compartmentalized development leads to underdelivering capabilities. Most soldiers can clearly recall a moment when they were handed a "new" piece of equipment that was technologically outdated, non-conformal with logistics apparatus, or grossly ill-designed with operators in mind ("Man-packable" 30lbs rectangular box that clearly doesn't fit in any issued bag).

The Shift from Industry to Individual Solutions

Installation Innovation labs and unit-level "skunk works" give soldiers direct acquisition solutions, yet three hurdles persist: unpredictable capital, limited third-party T&E partnerships, and delayed legal concurrence for operational fielding.

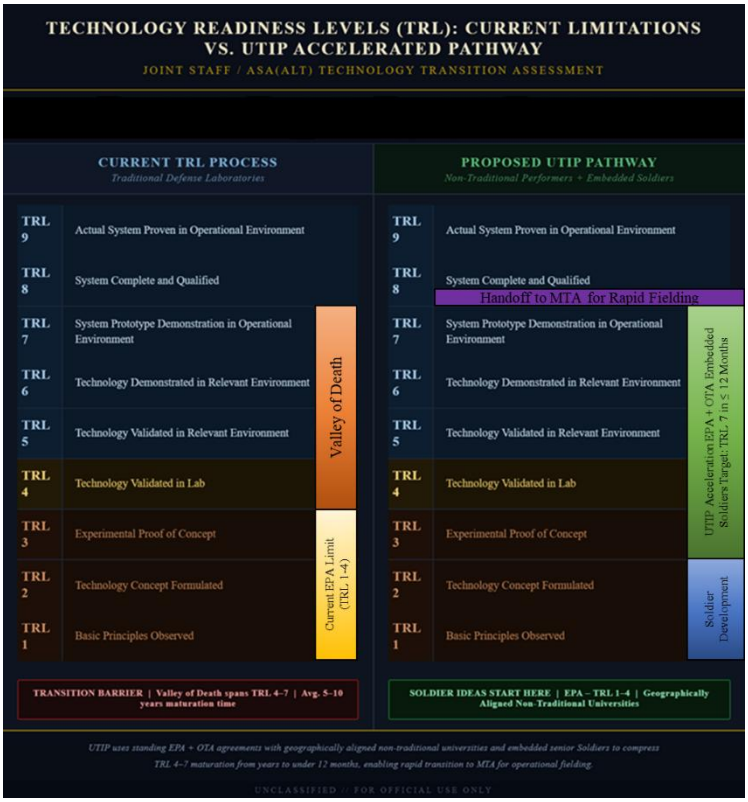
Obligated funding for soldier labs is uncertain. Units often rely on O&M for its reactivity to address rapid procurement efforts, such as unforecasted requirements. However, its suitability is unpredictable due to pressure on units to meet quarterly expenditure targets, which risks a

reduction in the following fiscal year. RDT&E funds, in concept and name, should be a “best athlete”, but stringent forecasting due to alignment with the POM cycle largely makes them inflexible for emerging capability development. What is needed are unobligated funds that can be spent outside of a month-to-month execution model.

Non-Traditional Defense Performers—such as universities partnered through DEVCOM and C5ISR—deliver prototypes for commercialization and fielding. Though often limited by standard Education Partnership Agreements (EPA) to TRL 2-4, many have the expertise and equipment needed for end-item quality. Their ability to mature pre-production prototypes is largely underutilized. They are, however, uniquely positioned to bridge the RDT&E shortcomings in low-cost soldier-built initiatives from unit labs. Apart from adequate lab resources and experts, in many occurrences, they have unburdened queues, operate off a multiplicity of funding streams, and are geographically aligned with Department of the Army installations. In many cases, they also have the ability, via possession of a cage code and DUNS, to operate as a training vendor for specialized skill buckets (embedded systems, software-defined radio, antenna design, etc.). (Collaborative Partnerships - DEVCOM Army Research Laboratory, n.d.)

University Technical Integrator Program (UTIP) Proposition

The UTIP is an “open-door” re-envisioning of structured EPA’s leveraging OTA prototype agreements to service individual Department of the Army Units, introducing a fast track for non-critical soldier-built hardware. Its goal is to accelerate pre-production prototypes through Non-Traditional Performers to achieve authorized fielding in operational environments and TRL 7 within a period not to exceed 12 months. Non-Traditional Performers meeting requirements to support sufficient T&E would be aligned regionally to support multiple installation locations. For example, the Virginia Polytechnic National Security Institute would cover Ft. Belvoir, Ft. Langley-Eustis, and Ft. Lee.



This concept benefits both the Army and universities by offering a rapid pathway for soldier-built solutions that reduce acquisition time and cost. For example, a unit needing a new type of vehicle mount can produce it with a metal powder bed fusion 3D printer, avoiding vendor contracts, expensive development, or lengthy maintenance. If it breaks, make a new one. UTIP provides open access to expert evaluations in environmental survivability, shock, vibration, and metallurgy, ensuring reliability and durability.

UTIP benefits EPA universities by enabling alignment with defense initiatives and increasing delivery throughput. New funding streams are created, allowing these Non-Traditional Performers to respond rapidly to budgetary demands and capability surges. In times of need, universities are already positioned to assist. UTIP does not intend to disrupt the commercial defense sector or limit competition (SBIRs, Prime Contracts, startups). Its goal is to empower soldiers and universities to address low-cost, quick-turnaround requirements, fostering unit-level innovation and keeping pace with modern battlefield demands.

Embedded soldiers under UTIP would be merit-based selected, possessing significant operational and combat leadership experience in addition to demonstrated aptitude for army acquisition systems and funding vehicles. Soldiers assigned will provide representative consultation (insight from lived experience), T&E oversight for product maturation, and ensure alignment between the customer and the sponsoring Non-Traditional Performer (capital and timelines). An already established mechanism for the material assignment of personnel would be the Pathway for Innovation and Technology Office (PIT, est. 2025) under the Assistant Secretary of the Army for Acquisition, Logistics and Technology (ASA(ALT)) or the Defense Contract Management Agency (DCMA). In the interim, this could easily be added to the Broadening Opportunities Program, managed under HRC, as a 12-month consecutive ADSO internship. Ideally, and at realized potential, this would be a PCS assignment to retain continuity of programmatic relationships and product development.

Scaling UTIP to enroll multiple universities only increases operability. In a networked topology, universities can work cohesively when specialized issues arise. Offloading work capacity means shifting tasks to other institutions during periods of high demand or inactivity. Engaging centers of excellence means leveraging facilities with expertise, such as anechoic chamber testing (for sound and electromagnetic isolation), PCB milling (for manufacturing printed circuit boards), or

electron microscopy (for observing materials at very high magnification). Additionally, universities can collaborate on projects to meet specific requirements.

Supply Chain management is an integral component of what UTIP provides. Universities offer a more cost-effective procurement pathway for unique situations in which compliance with the National Defense Authorization Act (NDAA) or the International Traffic in Arms Regulations (ITAR) is difficult. Development at the soldier level or in home labs often occurs using prohibited electronic components or physical designs (form factors). Software-defined radio (SDR), such as the EPIQ series, is a good example. Engaging with experts in Field-Programmable Gate Arrays (FPGAs)—which are chips that can be programmed after manufacturing—or bare-metal-level programming, which means programming hardware directly without an operating system, opens the door to enhanced development opportunities.

Rationale and Urgency for Implementation

Given the redesign of the Federal Acquisition Regulations, the adoption of the Joint Requirements Oversight Council (JROC), which assigns ownership to the component service, and the activation of Operational Acquisition Detachments, the timely implementation of this program is particularly relevant (Wright, 2026). Recent conflicts in Ukraine and other transregional engagements involving Great Power Competitors underscore the critical importance of innovation. Integrating soldiers into the capability development loop and leveraging the industrial base provided by universities represent essential steps toward delivering appropriate equipment to operators in real time.

References

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