Trends in US Army Ground Vehicles and Robotics Programs Supporting Army Modernization

NAMC's value-add in supporting these trends

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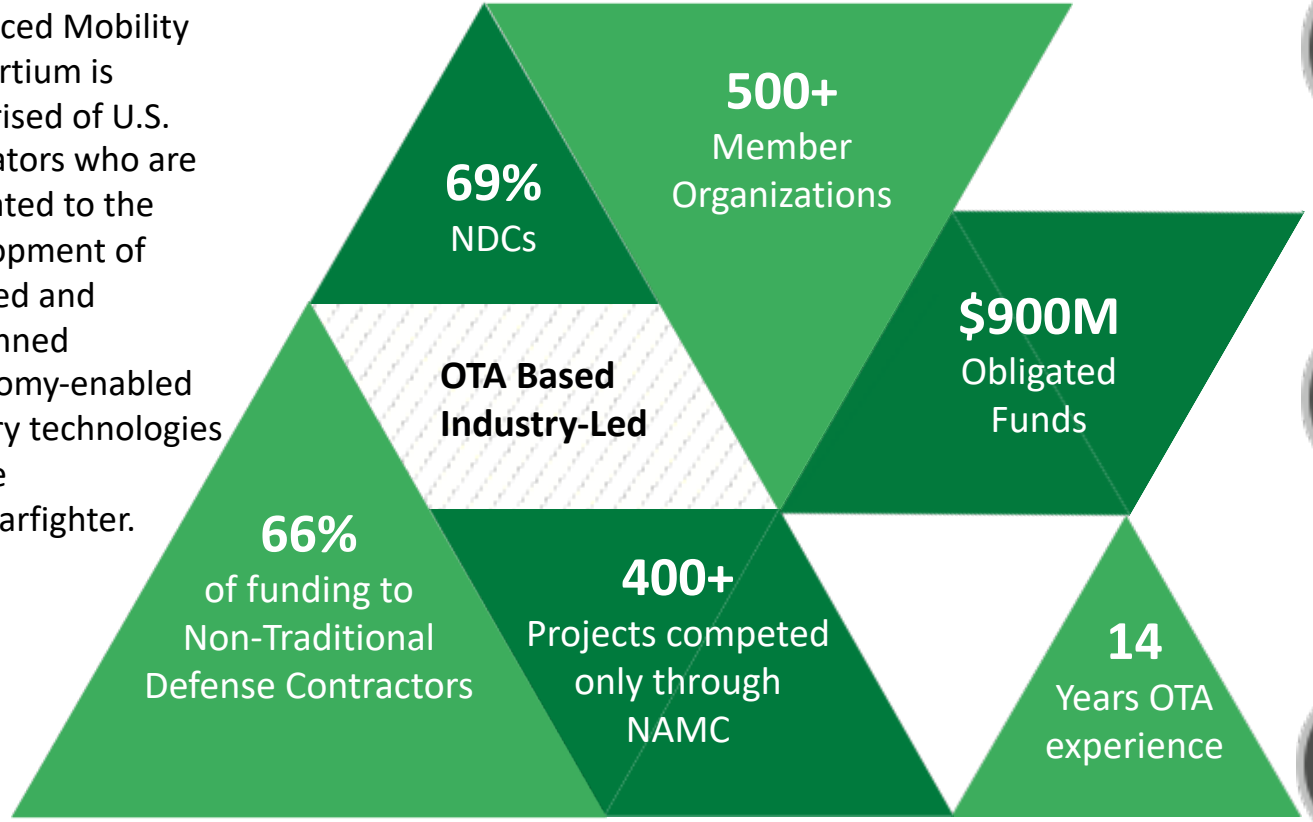
NAMC I Who We Are

The National Advanced Mobility Consortium is comprised of U.S. innovators who are dedicated to the development of manned and unmanned autonomy-enabled military technologies for the U.S. warfighter.

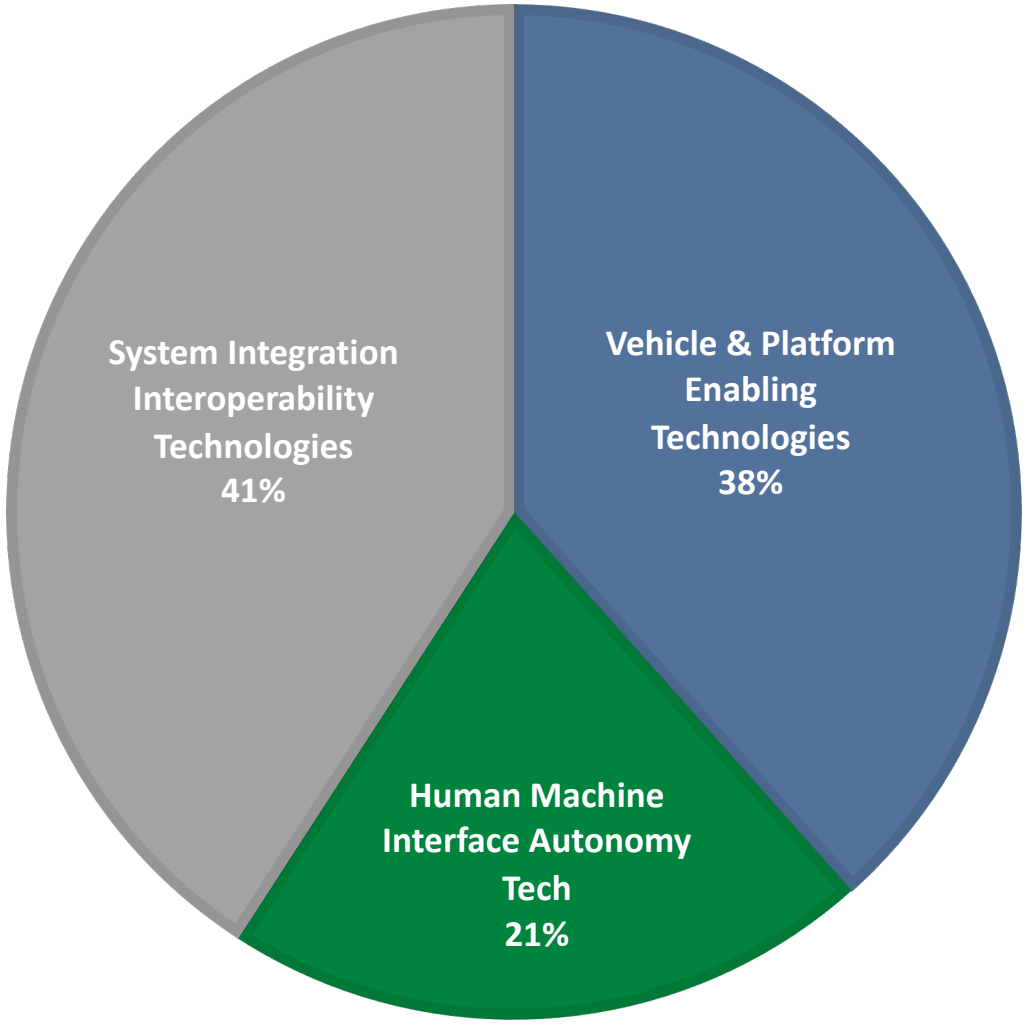


INNOVATION
Execute technology demos and workshops for market research and end-user input

COLLABORATION
Lead cross-consortium collaboration efforts to embrace the multi-domain ecosystem

EDUCATION
Develop communities of interest to garner feedback on standards, specifications and requirements.

NAMC I Member Expertise



NAMC I Who We Are

MEMBER-LED	Our consortium is member-led, this means, most of our Board of Directors are elected from within the membership. We are not a consortium management firm (CMF), our business is our consortium and the services we provide to both our members and customers.
MEMBERSHIP	Membership is vetted, and comprised of organizations; defense contractors, non-profits and academic institutions, with a U.S. presence, who submit their technologies in response to project calls that are competed only through the consortium.
TEAMING	Not only do members compete for projects as prime, but there is also ample opportunity for teaming and developing other business relationships among the membership. NAMC requires that only the prime be a member of the consortium.
RESOURCES	The NAMC works with its members to understand the Enterprise, propose their technologies concisely and accurately, and market their technologies to other members and the Government.
FEES	Dues are kept at a flat, low rate to ensure that they are not a barrier for entry for any organization. No other fees are assessed of our members at this time.

NAMC I Project Platforms

ANNUAL PLAN

Compendium of projects that are competed in advance of funding availability.

BASKET PULL

Home of competed, technically acceptable proposals from NAMC members available for funding.

AD HOC PROJECTS

Funded high dollar and priority projects.

SBIR PHASE III EFFORTS

NAMC relevant follow-on SBIR efforts that are direct awarded.

TASK REQUESTS

NAMC administered strategic systems of systems projects, workshops and demos.

NAMC I Notable Projects

Common Robotic System (CRS) -- Individual (I) & Heavy (H)

PackBot

Infantry Squad Vehicle (ISV)

Heavy Equipment Transport System (HETS)

Squad Multi-Purpose Equipment Transport (SMET)

Ground Vehicle Materials Flash-2-Bang

Robotic Combat Vehicle (RCV) -- Light (L) & Medium (M)

STRATEGIC INITIATIVES & PARTNERSHIPS

MOSA	**ROS-M**	**10X22**	**AAL**
CMOA	**RTK**	**AFC Innovation Combine**	

DoD/GVSC Areas of Focus

- Electrification
  - Hybrid tactical vehicles by 2035; fully electric by 2050
- Robotics and autonomy
  - Artificial Intelligence and modular mission payloads
- Modeling and Simulation
  - Digitization (Digital Twin): Rapid design, TEVV, and experimentation
- Advanced Manufacturing
  - Establishing a large 3d printing facility at the Arsenal (not through NAMC)

Electrification

- Electric Light Reconnaissance Vehicle (eLRV) RPP 22-04 TBD
- Joint Tactical Light Vehicle
- Issues:
  - Energy density
  - Charging stations
  - Safety (fires, protection, etc)
- Enablers:
  - Commercial automotive battery design

Robotics and Autonomy

- Robotic Combat Vehicle RPP 19-01/13
- Leader Follower (moving in direction of full autonomy) RPP 5, AP22-05
- Obstacle Avoidance/Digital Mapping (TR19)
  - Navigation algorithm, Modular mission payloads for MTRS and CRS-H
- Robotics and Autonomous Systems-Ground
  - Modular open systems interface standard for ground robotics (IOP)
- RACER (DARPA)
- Issues:
  - Maturity of AI
  - Machine Learning: size and brittleness of training sets
  - Edge cases
- Enablers:
  - Robotic Technology Kernel
  - Modular Open Systems Approach

Enablers, Continued

- Robotics Technology Kernel
  - Library of services for building common autonomy software stack
  - Army adoption as de facto software standard for military ground RAS
- Modular Open Systems Approach (MOSA)
  - Improve interoperability
  - Increase competition
  - Improve technology refresh
  - Encourage innovation
  - Cost saving/cost avoidance

Modeling and Simulation

- Optionally Manned Fighting Vehicle (OMFV)
- Optionally Manned Tank (TR20)
- Issues:
  - Varying degrees of fidelity between models: physics-based, behavioral, environmental
  - Data sets: sensors information, machine learning training sets

- Enablers
  - Anvil
  - Game based simulation and experimentation using Unreal, Unity
  - One Semi-Automated Forces (OneSAF)
  - Computer Aided Design