US Army Strategy for Robotic and Autonomous Systems (RAS)

Agenda:

- Operating Environment
- Background
- Purpose/Vision
- Strategy

MAJ Mike Dvorak
Michael.G.Dvorak.mil@mail.mil

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Operating Environment

Threats:

- **Increased lethality and sophistication.**
- **Accelerated pace of operations.**
- **Eroding military advantage.**
- **Congested operating environment.**

Opportunities:

- **Greater situational awareness.**
- **Higher performance compared to manned, opt.-manned systems.**
- **Greater flexibility.**
- **Operate at machine speed.**
- **Leverage cloud robotics.**
- **Ability to learn.**

The Strategy Development Path

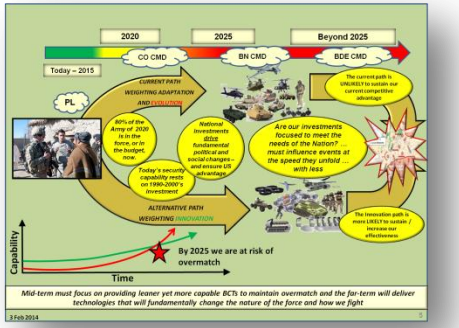
Army Internal Guidance

1. CSA-GEN Odierno: 2013 guidance to TRADOC
2. Army Operating Concept

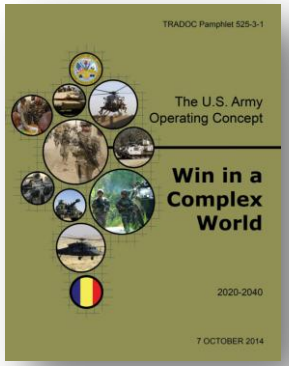
External Guidance

3. 2014 Quadrennial Defense Review
4. 18th Chairman's Strategic Direction

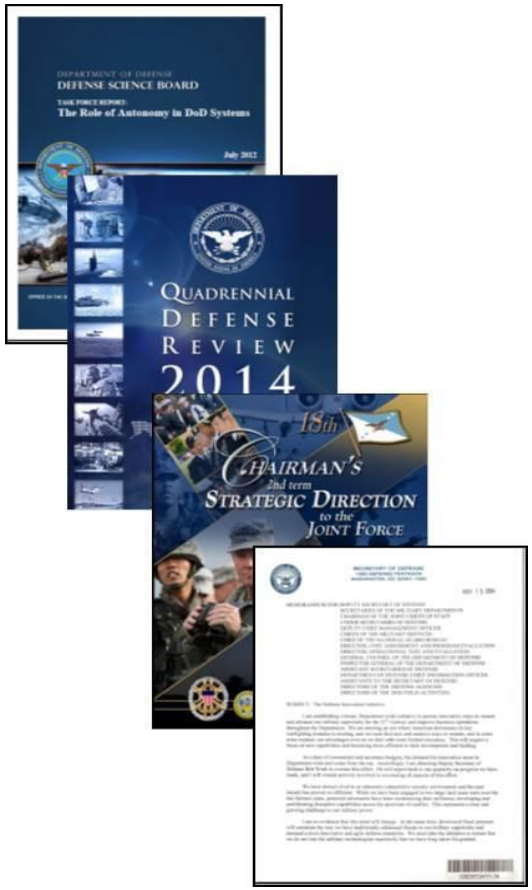
Key Point: Senior Leader Emphasis



CSA 2013 Guidance on Army Innovation



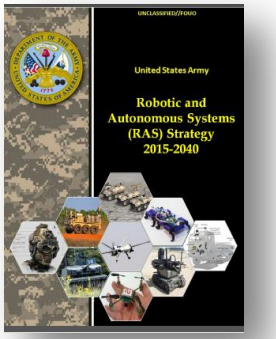
Oct 2014 Army Operating Concept



The RAS Strategy

Purpose - Articulate a strategy that will:

- **Align** and prioritize robotics and autonomous systems requirements across all formations
- **Describe** operational employment of RAS in Force 2025 and Beyond
- **Integrate** RAS as an increase in capability and a key to the Army's *differential advantage* over adversaries



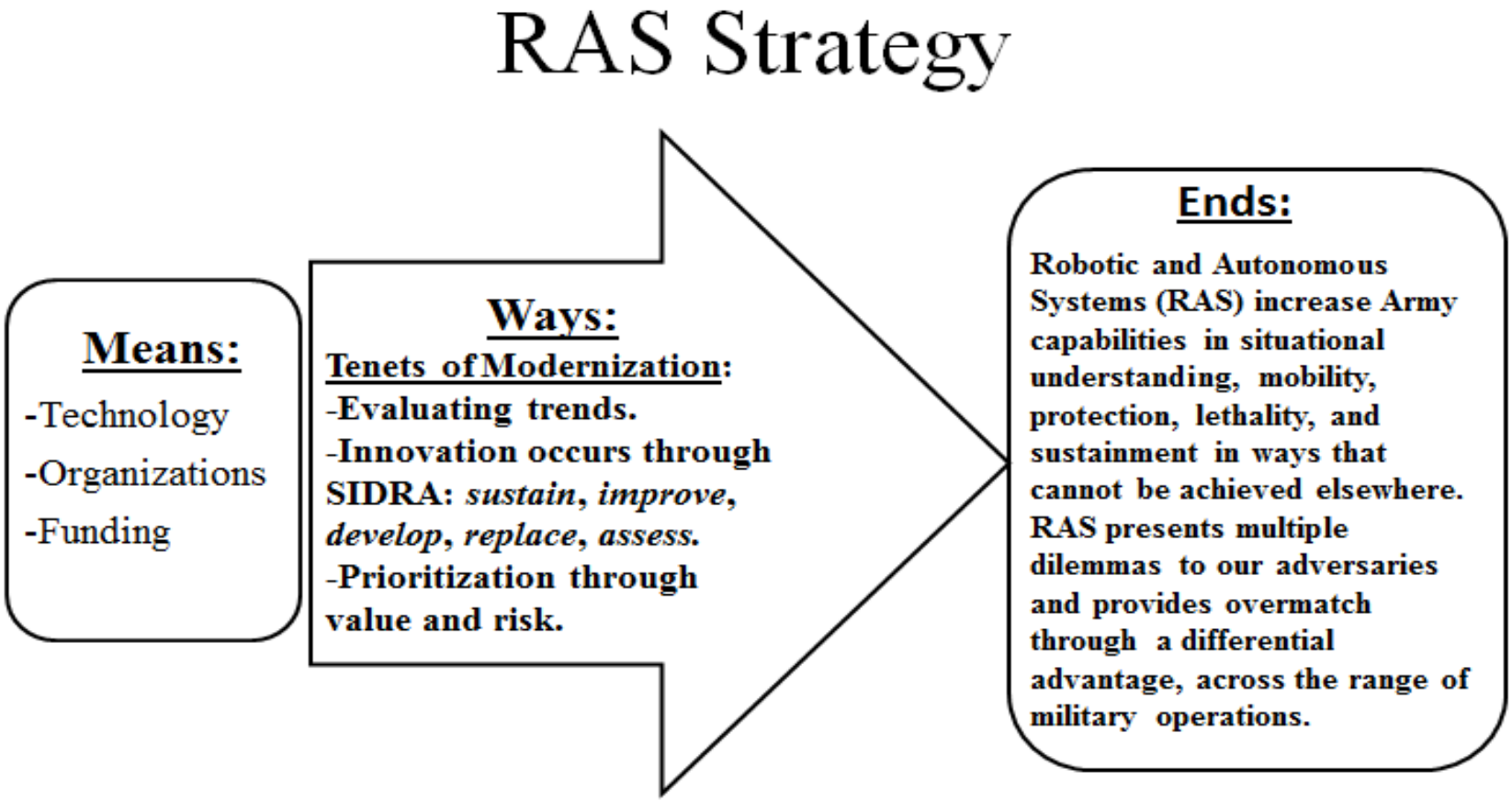
Vision - RAS priorities:

1) Protect the force at increased stand-off distances
2) Improve situational awareness
3) Lighten physical and cognitive workloads
4) Sustain with increased throughput and efficiency
5) Facilitate maneuver in Combined Arms Operations and Wide Area Security
6) Conduct lethal and non-lethal engagements where manned systems are limited, denied entry, or unavailable

(*From a January 2013 Sec. Army (McHugh) approved plan)*

RAS must enable Army formations to retain overmatch, support expeditionary and **joint combined arms maneuver**, and enable Army forces to win in unified land operations

The Strategy:
"Turning ideas into valued outcomes"

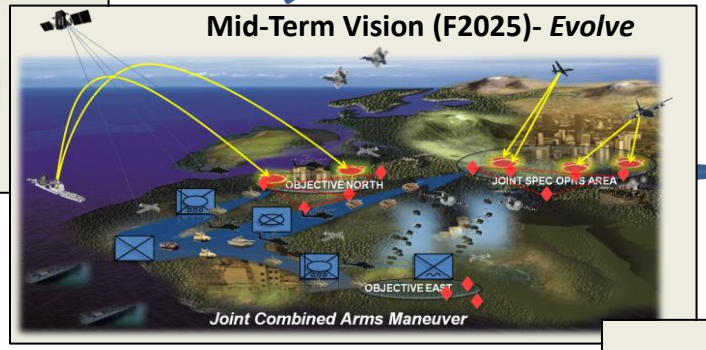


Framing the Plan in Three Phases

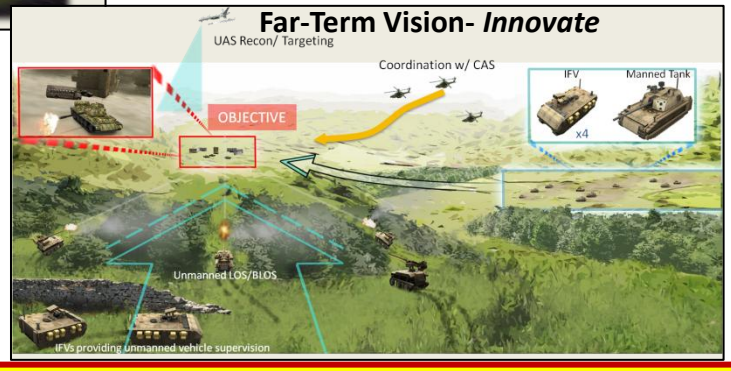
As the Army articulates RAS integration across multiple Warfighting Functions, this vision must also show ***realistic objectives*** in the **near-term**, ***feasible objectives*** in the **mid-term,** and ***visionary objectives*** for the **far-term.** Beginning with near-term objectives, each successive phase links its objectives to and builds from the achievements of the previous phase.

Near-Term Vision- *Adapt*

Mid-Term Vision (F2025)- *Evolve*

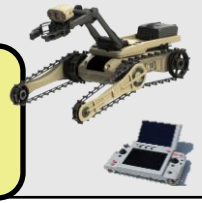
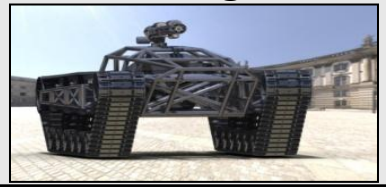
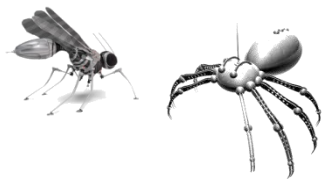


Far-Term Vision- *Innovate*



Source for All Listed Objectives: **TRADOC Pam 525-3-1, *Army Operating Concept*, Appendix C-2.**

Army RAS

Soldier Transportable	Vehicle Transportable	Self Transportable	Robotic Appliqué
Small Common Robotic System – Individual (CRS-I) 	**Mounted** Man Transportable Robot System (MTRS) Inc 2 	**Soldier Follower**  Squad Multipurpose Equipment Transport (SMET)	**Remote Operation**  Husky Mounted Detection System (HMDS)
Platoon Short Range Micro UAS 	**Towed**  M160 Light Flail	**Recon/Security**  Mobile Detection Assessment and Response System (MDARS)	**Supervised Autonomy**  Automated Convoy Operations (ACO)
Squad Soldier Borne Sensor 	**Installed** da Vinci Surgical System 	**Robotic Wingman** 	**Exoskeleton** Tactical Assault Light Operator Suit (TALOS) 
Nano Bot 	**Humanoid** DARPA Robotic Challenge 	**Squad Member** DARPA Legged Squad Support System (LS3) 	**Prosthetics** 

- Program of Record
- Draft JCIDS Requirement
- Technology Initiative

ere!

Photos are Notional Representations

NIE 16.1 & Sikorsky ERWR Demo

SEP+OCT

Summary

- **RAS provide the Army with differential advantages over adversaries and this Strategy will seek to exploit those capabilities**

- **The Army Robotics and Autonomous Systems Strategy will:**
  - ✓ Focus near-term capabilities to enable the Soldier
  - ✓ Focus mid-term capabilities to improve the unit capabilities and human-machine collaborations and teaming
  - ✓ Scope far-term capabilities to improve operations and achieve transformative capabilities
  - ✓ Prioritize rapid fielding of mature robotic technologies into the hands of the Warfighter

- **Army Warfighting Assessments and other events within the Campaign Of Learning will inform RAS development efforts**

Questions?