



NDIA

Ground Robotics Capabilities

Realizing the Robotic &
Autonomous Systems Vision
2 March 2016

Frank Kelley

Deputy Assistant Secretary of the Navy
Unmanned Systems

Leading the Way on Unmanned

“appoint a new Deputy Assistant Secretary of the Navy for Unmanned Systems, who will help **bring together all the many stakeholders and operators** who are currently working on this technology in order to **streamline their efforts**”

“Unmanned systems, particularly autonomous ones, have to be **the new normal in ever-increasing areas.**”

“The only limit to what this new technology can do for us **is our imagination.**”



Navy Secretary Ray Mabus, April 2015

Leading the Way on Unmanned

"We look toward increasing autonomy, endurance and payload capacity of our unmanned systems, which provide our forces one of our truly great asymmetric advantages and promise to take on greater roles in the future force for both the Navy and Marine Corps"



ASN (RDA) Sean J. Stackley, November 2010

Building the Team



DASN (UxS) – Provide strategic leadership and overall Navy guidance for unmanned systems



OPNAV N99 – Lead rapid development of unmanned systems capability



DASN (RDT&E) – Lead technology prototyping and demonstration

***Teaming of acquisition, requirements, & research
to optimize our investments***

SECNAV Vision: Treat Unmanned as Unmanned

SUBJECT: Treat Unmanned as Unmanned

To accelerate the integration of unmanned systems, the Services shall:

- Establish a Director for Unmanned Systems in OPNAV and support the establishment of a DASN for Unmanned Systems in the Secretariat.
- Assess potential operational roles and missions for unmanned and autonomous systems which offer the broadest increase in warfighting capability and make recommendations for rapid demonstrations based on such findings.
- Assess other operational roles and missions where unmanned or autonomous systems should be considered.

The Services will provide their findings to ASN (RD&A) for a consolidated submission to the Under Secretary of the Navy. Unless otherwise specified above, submission will be provided to the Under Secretary of the Navy within 90 days of this memo.



cc:
USN
ASN
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THE SECRETARY OF THE NAVY
WASHINGTON DC 20380-1000

November 13, 2015

MEMORANDUM FOR ASSISTANT SECRETARY OF THE NAVY (RESEARCH,
DEVELOPMENT AND ACQUISITION)
CHIEF OF NAVAL OPERATIONS
COMMANDANT OF THE MARINE CORPS

SUBJECT: Treat Unmanned as Unmanned

Unmanned systems are inherently different from their manned counterparts. Policies and procedures which apply to the design, development, testing and evaluation of manned systems do not necessarily support unmanned system development. In some areas, existing criteria should be modified or eliminated, while in other areas, such as cybersecurity design, more rigor is required. Therefore, existing policies and requirements must be tailored to support expeditious and risk-appropriate processes for unmanned systems.

The DON will field and sustain diverse unmanned/autonomous forces capable of independent and integrated missions in all physical and operational environments, including cyberspace and the electromagnetic spectrum. Unmanned vehicles and systems have the potential to transform the naval forces by expanding existing capabilities and enabling new ones. These new capabilities must drive new operational concepts and create real advantages over adversaries.

To accelerate the development and fielding of unmanned systems and to ensure an integrated and efficient DON effort, ASN (RD&A) shall:

- Establish the position of Deputy Assistant Secretary of the Navy for Unmanned Systems and define roles and responsibilities.
- Identify manned system requirements germane to the design, development, testing and evaluation of unmanned systems and determine how to eliminate those which cause an undue burden.
- Publish a comprehensive DON roadmap for unmanned systems within one year of this memorandum.
- Develop aggressive goals for the acceleration of DON's unmanned systems and ensure the DON remains at the forefront of this emerging operational capability.

- Establish DASN UxS and N99
- Develop aggressive goals
- Eliminate superfluous requirements
- Publish a comprehensive DON roadmap
- Accelerate integration of unmanned systems



Where are we going?

Unmanned systems will fundamentally transform the way we operate as a Navy in the future

- Human/machine teaming
- Not a one-for-one replacement
- Use UxS/autonomy in most beneficial ways
- Unmanned systems need not be limited by domain

Unmanned and autonomous systems will transform the way we operate as a Navy in the future.

Where are we going?

Unmanned systems teamed side-by-side in all domains with our sailors and Marines.



Unmanned systems will integrate to unlock the full potential of our forces

Where are we going?

New approach:
Not a one-for-one replacement



≠



Change the way we think
Evolve the way we fight

Where are we going?

- Swarms of unmanned systems operate in concert to
- Distract and deceive our adversaries
 - Collect, process, and convey critical data
 - Intercept and counter threats



Where are we going?

Create an asymmetric advantage

- Deploy in contested areas
- Subterranean vehicles
- Undetectable nanosystems
- Vehicles rapidly created in theater



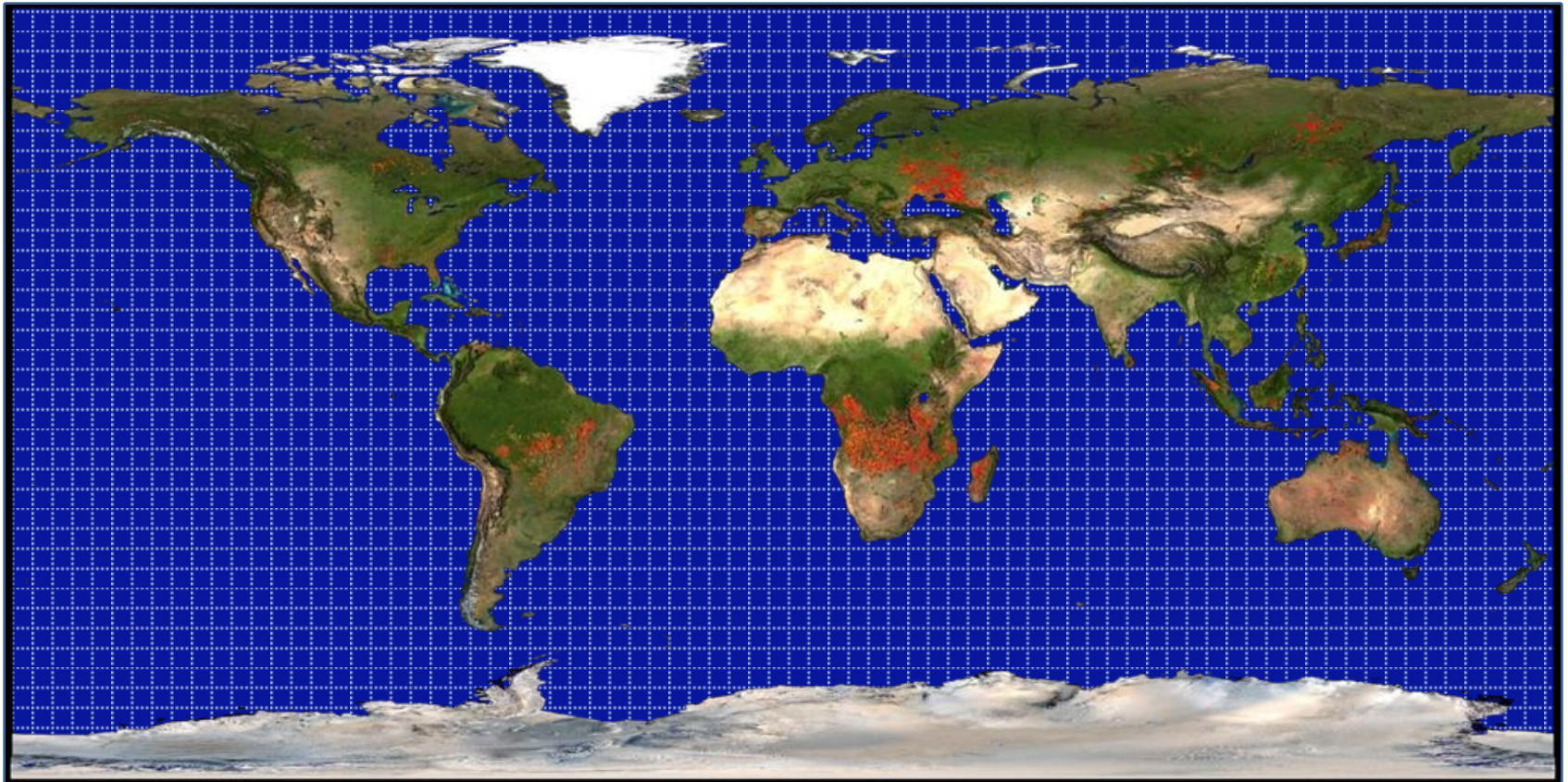
Where are we going?

Moving away from domain centric to environment centric



Where are we going?

A global network of deployed autonomous systems provides complete situational awareness 24 hours a day, 365 days a year.



How do we get there?

- Fully integrating human and unmanned systems is as much a military **cultural** evolution as a technological evolution



Evolving the culture



How do we get there?

- Evolve the legal, ethical, and policy framework for employing unmanned systems
- Autonomous and semi-autonomous weapon systems shall be designed to allow commanders and operators to exercise appropriate levels of human judgment over the use of force.

DOD Directive 3000.09

Evolving the culture

How do we get there?

- Developing trust is critical



Evolving the culture



How do we get there?

- Human in the human-machine team
 - People
 - Training
 - Personnel pipeline

Evolving the culture



How do we get there?

- Incredible research is happening in **autonomy** today but there are fundamental challenges remaining.
 - Autonomy is not a solved problem
 - Need to understand both the limitations and full potential of autonomy
 - Using autonomy in the human-machine team is what will allow us to unlock the full potential of our people

Autonomy is the key



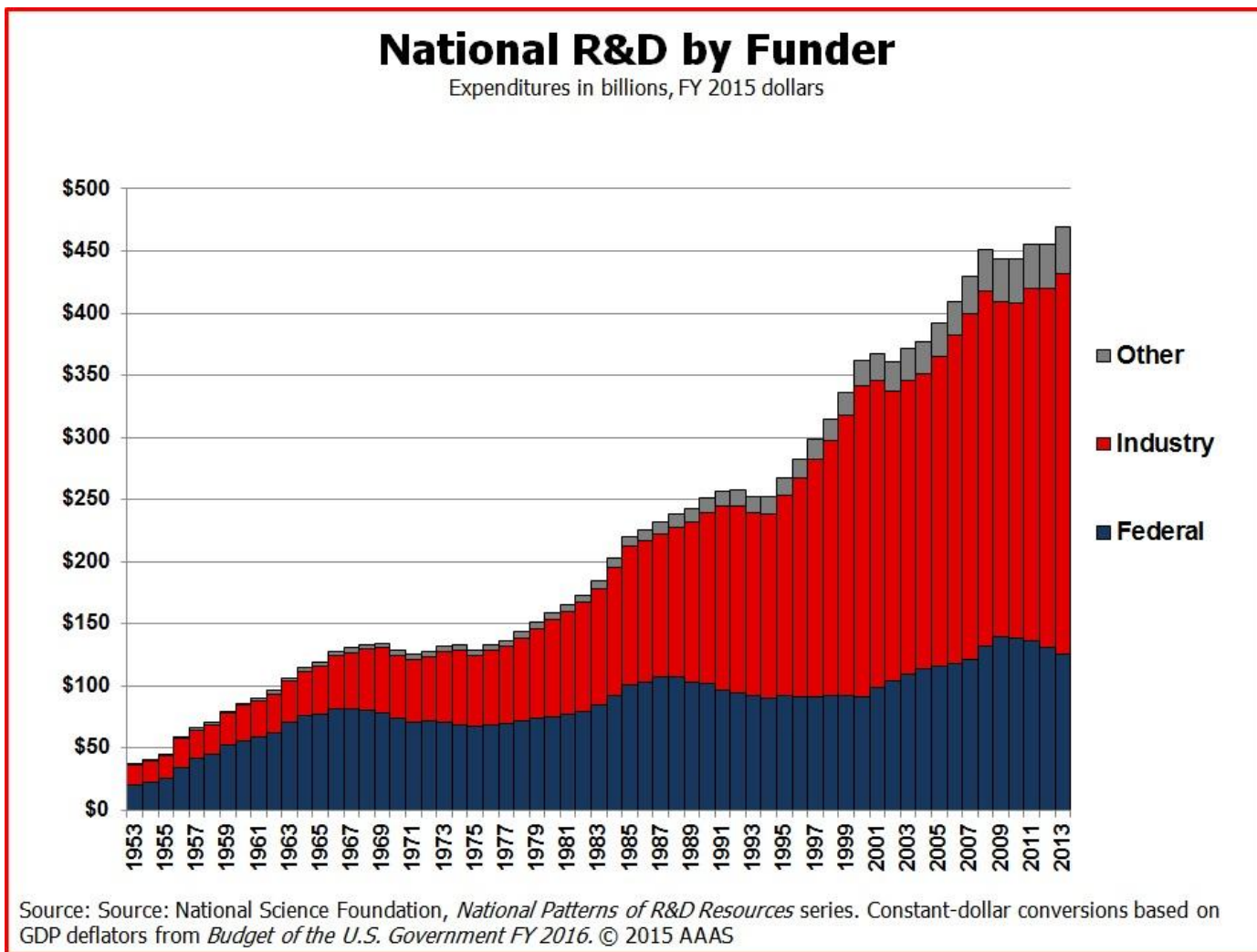
How do we get there?

- Innovative approaches to acquisitions and experimentation tailored to the rapidly evolving nature of unmanned technologies
- Close collaboration between government, industry, and academia

There is much to do to harness the potential of unmanned systems.

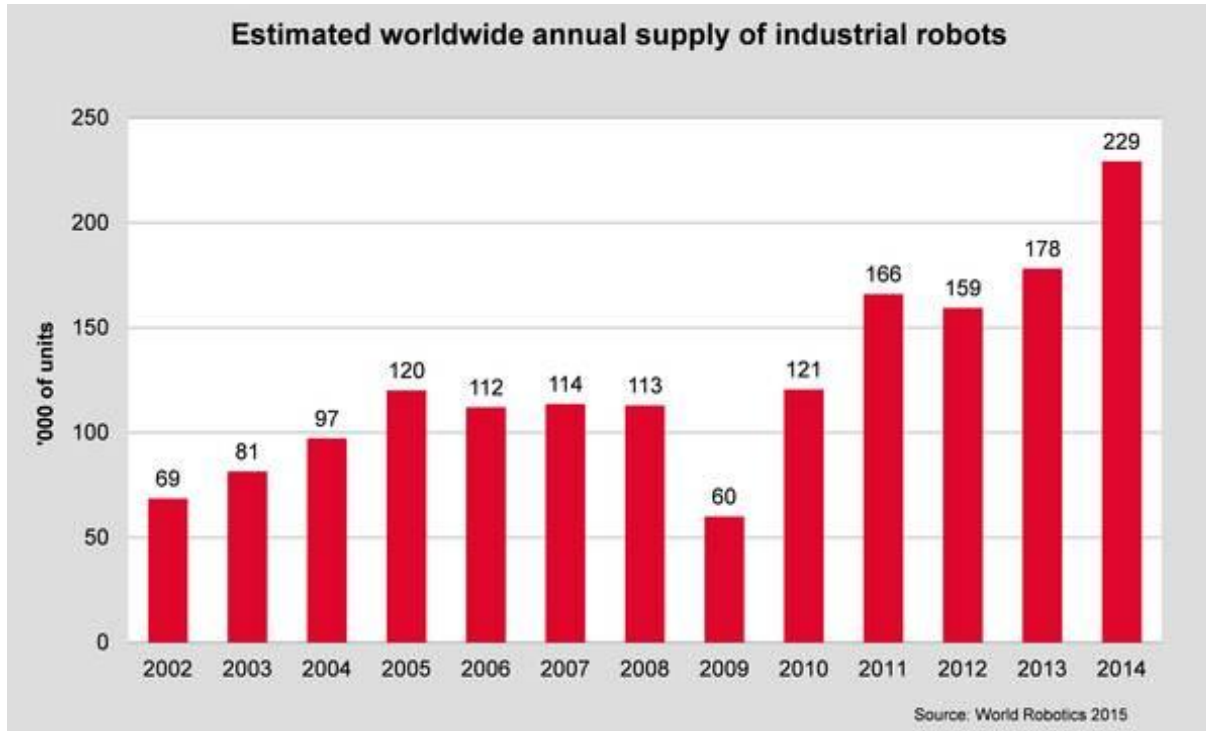
How do we get there?

➤ Strong and dynamic industrial base



How do we get there?

- Strong and dynamic industrial base to meet demand



There is much to do to harness the potential of unmanned systems.



The Journey...

Exceed human limitations to exploit
human potential



Visions from an Unmanned Future

- Change the way we think
- Evolve the way we fight

***We have an incredible opportunity to
build the Navy's future together.***