Achieving a 21st Century Defense Industrial Base

The Honorable Jacques S. Gansler*

Professor and Roger C. Lipitz Chair

Center for Public Policy and Private Enterprise

School of Public Policy

University of Maryland

*Dr. Gansler served as Under Secretary of Defense (Acquisition, Technology, and Logistics), 1997 - 2001

May 16, 2007

1

Changes that are Driving Security Transformation

1. <u>Holistic View of Security</u> – world-wide terrorism; pandemics; weapons proliferation; rogue nuclear states; energy dependence; insurgencies

2. <u>Technological Changes</u> – Info. tech, biotech, nano-tech, robotics, high-energy lasers, etc.

3. <u>Warfighting Changes</u> - Netcentric Warfare; Asymmetric warfare (bio, cyber, IEDs); Systems-of-Systems; Joint and coalition operations

4. <u>New Missions</u> - Homeland defense; missile defense; counterinsurgency; stability and reconstruction

5. <u>China</u> - Future adversary or Econ. Competitor (or Global "Partner")

6. <u>Intelligence Changes</u> - Integrated data; open-sources; Language and culture understanding

7. <u>Unpredictability</u> – Requiring agility, rapid responsiveness, broad-based capability

8. <u>Industrial Changes</u> - Horizontal & vertical integration; commercial high-tech advances

9. <u>Globalization</u> - Rapid spread of Technology; multinational firms; foreign sourcing

10. <u>Isolationist Moves</u> - "Buy-American"; discourage foreign scholars and students

11. <u>Defense Budget Shifts</u> - From Equipment to Personnel, O&M and Homeland Security

12. <u>Domestic Economics</u> – Health care; demographics; debt; trade

13. <u>Government Workforce</u> - Aging; wrong skill mix; judgment vs. rules; managers vs. doers

14. <u>Recent "Scandals"</u> - Druyun, Cunningham, Abramoff, etc.

We Are At A Critical Point - -

➡️ Similar to when Sputnik went up; or when the Cold War ended

➡️ The Security world has changed dramatically - - especially since 9/11/01 (geopolitically, technologically, threats, missions, warfighting, commercially, etc.).

➡️ However, the Defense Industrial Structure, the controlling policies, practices, laws, and the Services' budgets and "requirements" priorities <u>have not</u> been transformed to match the needs of this new world.

> **The last two decades have seen a consolidation of the 20th Century Defense Industry - - not a transformation to a 21st Century Structure.**

Assumptions for the Mid-21st Century

1. Declining real defense dollars (and perhaps no FY 09 Supplementals)

2. Continuing rapid technology changes

3. Continued globalization of advanced technology and industry

4. Continued trends in the diverse nature of conflicts

5. Far greater unpredictability of security needs

6. Current "Platforms", and those under near-term production, will form the major fielded platforms for the next 20+ years

7. "Services" will continue to grow (already 60%)

8. Intelligence and unmanned systems will receive greater focus

9. R&D Investments will shift to Netcentric-Relevant Architectures, Software, and C4ISR systems; which must be optimized as "systems-of-systems"

10. Industry will need to be incentivized to focus on innovation, in order to "stay ahead"

Current Situation

1. A fiscal crisis is coming ("hard decisions" will be required - - which will significantly affect industry, and will be strongly resisted by many). R&D most vulnerable.

2. The DoD is well prepared for a conventional, high-intensity war, but unprepared, and unable to rapidly shift to the needs of the "likely war" - - and likely conflicts are not simply subsets of the "big war" (as we found in Vietnam, Panama, Iraq, etc.).

3. Future adversaries are most likely to use non-traditional ("disruptive"/"asymmetric") approaches against us (using globally-available technologies in unexpected ways)

Current Situation (cont.)

4. **The structure of industry and Current trends in DoD investments, do not match the projected 21st Century security needs.**

    – Frequently fails to access the best available technology to respond to DoD needs

    – Lacks agility and flexibility and is often slow to respond to changes in missions and requirements

    – Is seldom cost effective or successfully manages the cost/schedule of new programs

    – Tends to be platform-centric, not network-centric

5. **DoD now buys more services than hardware, yet its acquisition practices are hardware-focused and poorly suited to acquire services.**

    – The broad span of services need sophisticated, targeted acquisition strategies/approaches. One size does not fit all.

    – As a result, DoD often fails to get the best value for its spending

continued →

Current Situation (cont.)

6. Both DoD and the supporting industrial structure lack the skills (e.g. systems engineering, analysis, etc.) to do objective, <u>independent</u> design and optimization of the increasingly complex and interdependent systems-of-systems required to handle the likely 21st Century threats.

7. There has been a shift away from both DoD and Industrial funding of longer-term S&T; as well as from capital investments

8. Funding for competitive prototyping and logistics transformation is not available - - yet both areas are critical to future military effectiveness

9. While the industrial world (civil and military) has globalized, security legislation, policy, and practices have not adjusted (e.g. ITAR, EAR, etc.) - - this hurts both military effectiveness and the Defense Industry

Current Situation (cont.)

10. **The mid-sized independent firms (e.g. $200M to $2B) are being acquired (further reducing competition and innovation)**

    – Contracts to mid-sized companies are down 40% over the past five years

    – This squeeze on mid-sized companies encourages M&A activity and increasing concentration in a handful of very large companies.

    – This deprives DoD of some of its most innovative and cutting edge technical support

    – It also reduces the pressures on large companies to manage costs

11. **There is less "disruptive" innovation coming from vertically-integrated, large firms and fewer incentives (encouragement) for it coming from the DoD (e.g. funded unsolicited proposals); and their acquired companies (small and medium sized) have tended to lose their innovation after the acquisition**

12. **Significant barriers exist for commercial firms, commercial products, and commercial practices to become parts of the industrial base**

continued ⟶

Current Situation (cont.)

13. Based on statements (from government and industry) vertical integration (along with C.O.I.) has become a greater concern since the 1997 DSB study of the subject (due to changes in industry structure and government acquisition practices e.g. LSI, TSPR)

14. The Defense Industry is considered (and treated as) a "mature" industry when what is needed is a dynamic, agile, innovative, info-based, 21st Century industry

15. For the industrial structure to change, it will require significant changes in the way the DOD does its business (from the "requirements process", through the budget, acquisition, and support processes)

There is a clear need for a <u>transformation</u> of the U.S. Defense Industrial Base; and it is up to DoD to achieve it.

Desired, Broad Characteristics of the Mid-21st Century Security Industrial Base

1. Satisfies the Broad Range of Mid-21st Century National Security needs - - <u>within the resources available</u>

2. <u>Technologically Advanced</u> – to maintain a posture of "technological superiority" (in systems, and, systems-of-systems - - both hardware, and software)

3. <u>Innovative</u> (in architectures, products, processes, and applications) - - with appropriate focus on "game changers" and prototype demonstrations

4. <u>Agile</u>, to meet major security "surprises;" and <u>highly-responsive</u>, to address adversaries changes and "surge"

continued ⟶

Desired, Broad Characteristics of the Mid-21st Century Security Industrial Base (cont.)

5. <u>Resilient</u>, to physical and cyber attacks (and other "vulnerabilities")

6. Draws Fully on <u>Commercial and Global Technologies</u>

7. <u>Lower Cost</u> (through product and process design) - - to procure adequate quantities - - yet with continuous performance improvements

8. <u>Highly competitive</u> - - at <u>all levels</u> - - <u>for innovation</u> and cost benefits (i.e. "Best Value")

9. <u>Financially, Viable</u>, to attract capital and investment (in new technology, capable people, etc.) - - even in a challenging fiscal environment.

Specific Mid-21st Century Defense Industrial Base Requirements

1. <u>Design teams</u> in all critical areas- - through prototyping (not necessary to have production underway, but should have plans for production)

2. Existence of a number of high-quality, competitive, and <u>independent</u> "systems architecture/engineering and software" firms - - who are willing to take "hardware exclusion contracts"

3. A "<u>globalized</u> defense market"- - technology transfer with allies and buying from the best - - with proper risk-based concern, regarding security

4. More small and medium-sized firms - - adequately funded and focused on <u>competitive innovation</u> (i.e. "open up" the defense industry; vertical "<u>de</u>centralization")

5. <u>Independent "red-teams"</u>, to represent potential asymmetric options from adversaries (using modern, global technologies in reaction to our systems and solutions)

6. <u>Network-Centric Industrial Operations</u> - throughout the life cycle, and interconnected to government and supplier bases (i.e. info-based, non-proprietary "enterprise integration")

For an Industrial Transformation, the DoD Must Transform Its Business Model

1. Achieve Lower Costs and Faster-to-Field, while still achieving better performance

2. Focus on "Staying Ahead", by adequately funding "engines of Innovation"

3. Focus on Net-Centric Systems-of-Systems

4. Achieve far greater use of "Best Value" Competitions

5. Understand and Realize the Benefits of Globalization

6. Stress the Importance of a High-Quality, High-Skill Government Acquisition Workforce

7. Transform the DoD Logistics System to a Modern, World-Class Information-Based Supply-Chain

8. Envision, Monitor, Incentivize, and Achieve the desired 21st Century Industrial Structure (working with DHS and DNI)

The Suppliers will respond to the Transformation of its Customer.

Example of Potential Incentives: Profit Policy

Take full advantage of current DFARS Guidelines that allow added profit percentage for the following:

➡ "Cost Efficiency" (Factor 4, added in 2000)

– Reduction or elimination of excess facilities

– Cost reduction initiatives

– Incorporation of commercial items and processes

– Contractor investment in cost-reducing facilities

➡ "Technology Incentives" (Factor 1, added in 2000)

– For significant innovative changes that:

• Fundamentally reduce the costs or improve the reliability of existing products

• For new products, that fundamentally reduce the costs or improve the reliability of the products they replace

One Organizational Change That Could Have a Significant Positive Impact in a number of areas would be to Change the designation of the DoD Chief Information Officer (CIO) :

➡ Make the current USD (AT&L) the CIO [which meets the requirements of Clinger-Cohen and of Goldwater-Nichols - - which are now in conflict]

➡ Put the Asst. Secretary (Networks and Information Integration) under the USD, and change the USD title (to IAT&L) - - this would emphasize the importance of information-centric systems, both for warfare and for infrastructure

➡ This could have a significant impact on both DoD effectiveness and efficiency

For an Industrial Transformation, There Must a DoD Business Transformation

- DoD and Congress must shift from a posture of "maximum risk avoidance" (through over-regulation, protection, etc.) to an objective of effective and efficient acquisition management

- The "model" should be a Government/Industry Partnership, in a continuously competitive market, striving for an industry that is flexible, adaptive, agile, innovative, low-cost, high-quality, and satisfies 21st Century security needs

- The semi-annual CEO meetings, with the Sec. Def./Dep. Sec. Def. and Service Chiefs, should be reintroduced

Strong Leadership is required to overcome the expected institutional resistance - - this must be a high priority, or it will not happen!

On Making Change in Government

"It Must Be Remembered That There Is Nothing More Difficult To Plan, More Doubtful Of Success, Nor More Dangerous To Manage, Than The Creation Of A New System. For The Initiator Has The Enmity Of All Who Would Profit By The Preservation Of The Old Institutions And Merely Lukewarm Defenders In Those Who Would Gain By The New Ones."

Niccolo Machiavelli "The Prince" (1513)

Back-Up Slides

1. DoD to Focus on Net-Centric Systems-of-Systems

- Shift resources (from platforms) to provide adequate funding and top people to optimize the complete systems-of-systems, within available resources - - with full recognition of the "complexity" of such systems-of-systems

- Require a government "systems architecture/engineering manager" on each major program; and provide experienced government Program Management and Systems Engineering oversight capability on systems-of-systems (a la FCS) - - establish the intent to do this in RFP

- Utilize a "systems architecture/engineering firm" to support the government and independently optimize the systems-of-systems (with hardware and software exclusions to avoid conflicts-of-interest)

- Make "interoperability" a KPP, (and ensure it is fully tested on a system-of-systems basis, and within cost constraints). [Interoperability is _not_ primarily a technical issue, it is a governance issue.]

- Establish small "Red Teams" (government and/or industry) to independently attempt to counter systems with globally-available technology

- Budget and program based on mission "capabilities portfolio management" (e.g. Battlespace awareness; joint command and control; etc.)

2.) DoD Must Focus on Achieving Lower Costs and Faster-to-Field (while still achieving better performance)

➡ "Requirements" Changes

➡ Acquisition Process Changes

➡ Budget Process Changes

➡ Logistics Process Changes

➡ Government/Industry Interface Changes

Details ⟶

2. DoD must Focus on Achieving Lower Costs and Shorter Cycles (while still achieving better performance)

- Change the "requirements" process, so costs and schedule are part of a systems analysis effort that precedes a firm set of "requirements" from the JROC (in which cost and schedule are firm i.e. unit cost fixed and "time-defined" acquisitions)

- Utilize "experimentation", with user feedback, on prototypes (hardware and software) to establish "firm requirements" for new systems and subsystems

- Utilize a true "spiral development" process for all weapons systems (based on proven technology and with a 5 year cycle for Block I, from milestone B to I.O.C.); with the option of competition (prime and/or subsystem) at each block (depending on performance and cost results from prior block); and with R&D always being funded for subsequent blocks

- Budget Programs to realistic costs and schedules (e.g. ICA's)

- Ensure ability of the government's Program Manager to make cost/schedule/performance trades on each Block, with the approval of the USD (AT&L) and lead Service Chief (or the VCJCS), without going back to the JROC

- Create, and adequately fund, a "Rapid Fielding Organization"; (using current programs and funds) [ref. DSB 2006 Summer Study]

- Achieve "Enterprise Integration" of information systems across DoD and between DoD and Industry (at all levels) [The role of the Defense Transformation Agency.]
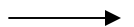
3. DoD must Focus on "Staying Ahead"

- Increase S&T (especially research) budgets; and focus a significant share on "disruptive" architectures and technologies (i.e. "game changers" – including prototype, users demonstrations.

- Set up a new R&D Funding Source:

  ➢ "Disruptive Systems Demonstrations" (under DDR&E)

    ➢ Use 6% of the RDT&E budget (≈$4B/yr)

    ➢ Limit to mid-sized firms (and allow some by independent Divisions of Large Firms)

    ➢ Take through field demos by SOCOM (or Rapid Fielding Org.)

    ➢ Use OTA and no formal "requirements"

    ➢ Aim for low-cost, and rapid fielding

- Return to separate (from B&P) industrial IR&D programs (does not require legislation) with appropriate government oversight and reporting. - - encourage dual-use technology

- Establish higher limits on size and amounts of DoD small business awards (e.g. SBIR) to encourage more small business firms to contribute to the innovation from DoD's S&T program: include a product-cost/manufacturing orientation; and, an S&T funded Phase IIB or III.
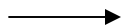
4. DoD Must Achieve far greater use of "Best Value" Competitions

- With the primary objective of innovation; and, secondarily, cost savings - - at both prime and critical lower tier elements

- Not a firm requirement (beyond the competitive prototype phase) as long as current producer is continuously improving performance and lowering costs - - but a credible option must always be present

- An inexpensive way to maintain the option is a second source funded for interchangeable, next-generation, lower cost/higher performance prototype (system or subsystem)

- Require "open architectures" on all systems (to encourage continuous competition for upgrades, and evolution in "system-of-systems architectures").

- Encourage FAR Part 12/ O.T.A use at lower tiers to bring in commercial suppliers

- Discourage Vertical Integration by awarding extra points in RFP for analysis of make/buy decisions by prime (with detailed comparisons shown of alternatives considered)

- Develop, and fully utilize new regulations and practices that focus on procurement of "services" (Vs. "things") - - especially for "professional services" and "contractors on the battlefield"

5. DoD Must Understand and Realize the Security Benefits of Globalization

- Coalition Operations will be the norm (for geopolitical reasons) so we must share technologies and train together

- Aggressively pursue tools and techniques to check COTS software

- Need is for "National Sovereignty" and Military Superiority - - foreign "dependency" need not mean "vulnerability"

- Significant Changes must be made in the ITAR, Export Controls, Berry Amendment, specialty metals, etc. to recognize the global defense market (with appropriate risk-based consideration of security and vulnerability concerns)

DoD must actively take the lead with State, Commerce, and Congress in this critically-important (but politically difficult) security area.

6. Stress the Importance of a High-Quality, High-Skill, Government Acquisition Workforce

➡ Be competitive with industry for the "best and the brightest"

➡ Develop and implement a training and career development program for government civilians (comparable to the military's program)

➡ Encourage industry-to-government and government-to-industry rotations

➡ Stress program systems engineering, production, support management skills (i.e. all "inherently governmental positions")

➡ Recognize that government is moving from the "doers" to the "manager of the doers"

➡ For all positions that are not inherently-government, these "industrial/commercial" should be subjected to "competitive sourcing" (between public and private sectors - - to achieve higher performance at lower costs

In this new security environment, the acquisition management challenges are far greater and the government must have the top people to achieve success.

7. Transform the DoD Logistics System to a Modern, World-Class, Information-Based Supply Chain

- The logistics system not only is the most expensive of the DoD acquisition processes, but it is the most critical for sustained warfighting.

- Yet, today, it is far from world-class (response is measured in weeks vs. hours; and there is little real asset visibility - - in spite of the high costs)

- The DoD must shift from a "supply push" system to a "demand pull" system based on "sense and respond" and secure I.T. (for "total asset visibility")

- Utilize performance-based-logistics or warranties on all systems (legacy and new) to drive up availability, while lowering support costs - - and, if the trends don't match these needs (on performance or costs), then be prepared to compete the support.

- Set up a new R&D Funding Source:

  ➤ "Logistics Transformation Implementations" (under TRANSCOM)
    ➤ Use 1% of current support budget (≈ $900M/yr)
    ➤ Make maximum use of commercial systems and software
    ➤ Objective is dramatic improvements in readiness and responsiveness at significantly lower costs

---

"We Can Not Achieve a DoD Transformation without a DoD Logistics Transformation"*

(General Rick Shinseki, Chief of Staff, U.S. Army (years)

8. DoD Must Envision, Monitor, Incentivize and Achieve a 21st Century Industrial Base Structure (working with DHS and DNI)

- Changes in acquisition practices (e.g. cost accounting, etc) to encourage civil-military industrial integration (at the plant level)

- Remove barriers to commercial firms (e.g. CAS) and encourage their participation (via OTA, FAR Part 12, etc.)

- Changes in "profit and overhead policy" to encourage the structural shifts, capital investments, lower cost initiatives, and incentives-for-entry by new and commercial firms

- Incentives for Reduced Vertical Integration (e.g. insight info) Increased government oversight of make-vs.-buy decisions by large prime contractors (a la F.C.S. P.M. role in prime's make-buy process)

- Assure strong, independent systems architecture/engineering firms

- Work with NIST to establish standards, (interfaces, not "common systems") protocols, security procedures, etc. to allow, and require, full network-centric (i.e. I.T.-based, enterprise-wide) industrial operations - - in all phases of the life cycle and at all times, and between government and all tiers of industry

- At least every three years, perform a detailed "sectoral analysis" of each critical sector of the defense industrial base (including a focus on the ability to have R&D competition in each sector, and including the potential for civil-military integration and for a global marketplace)