



Organizing Homeland Security Science and Technology

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Needed: A New Innovation System

- Question: How do we get the intra-government and industry interaction we must have to obtain the innovation we need for homeland defense?

The Problems:

- **Major R&D problem**
 - The big R problem: biothreat countermeasures
 - The big D problem: sensors, detection, knowledge management, data mining, physical protection
- **Big deployment challenge –**
 - 85% of critical infrastructure is in the private sector
 - technology transition will be crucial
 - big information management problem in Dept. and across agencies
- **Most R&D on homeland will be performed outside the new Dept. in other agencies and the private sector – how do you get these players on a common R&D roadmap?**

Different Gov't Life & Physical Science R&D Models

- **Vannevar Bush** – argued at end of WW2:
 - Fed. Science Role: drop applied, do fundamental
 - Results: NSF, NIH and the pipeline theory of R&D
- **Physical Sciences: Cold War DOD role (IT)**
 - Coordinated gov't-industry model; integrated R&D
 - DOD funds all phases: R,D,prototype, first market
 - Organizational model: DARPA
 - Even labs do applied and fundamental (Rad Lab at MIT, New Mexico Labs and Manhattan Project)
- **Homeland Security Dept.: more a Physical Science model than NIH model**

Key Sci/Tech Elements in the New Department:

- **Under Secretary for S&T**
 - Needs rank and title to obtain interagency cooperation
- **Darpa-like entity - HSARPA**
 - Lean, flexible, access to strong tech talent
 - “Other Transactions” procurement / Flexible hiring
 - With an “acceleration fund”
 - Leverage participation and cooperation by other agencies; involve the private sector
- **Establish “FFRDC(s)” – Lincoln/Rand model**
 - NAS study: need lab capability; key role in threat and risk assessment

Key Sci/Tech Elements in the New Dept., Con't:

- **Need – Interagency R&D Coordination Council**
 - Stand up as NSTC panel
 - Ensure other agencies participate, coordinate R&D
 - Use Strategy req. to develop interagency tech roadmap
 - Use with Acceleration Fund tool
 - Also need private sector participation
- **Clearinghouse**
 - Technology transition task; Outreach task
 - Place to evaluate private sector tech solutions

Key Sci/Tech Elements in New Dept., Con't

- **Technology coherence within the Dept.**
 - Chief Technology Officer role, not Acquisition
 - Sign off on Testing and Evaluation before tech deployment in the Dept.
- **Strategy for Private Sector Involvement**
 - For ex.: NIH doesn't make drugs, biotechs/pharmas do – need market mechanisms/incentives
 - For ex.: cybersecurity – industry must lead
 - Must involve and build in private sector role up front

Overall Issues

- First new major science/tech agency in 45 years, since Eisenhower's DARPA in 1957
- Private tech sector now much more robust – how do we best utilize new generation of entrepreneurs?
- We have decentralized science – has meant real safety nets and opportunities for research entrepreneurship
- But how do you build cross agency and cross discipline collaboration?
 - Acceleration fund; interagency council

Overall Issues, Con't:

- Must have robust Tech Transition
 - Strategy; Clearinghouse; put private sector on Council
- Lean: small, high-talent, procurement flexibility, non-bureaucratic entrepreneurial culture
- Enable private sector leadership
- Tackle information management challenge
- Integrated research, development, testing, evaluation, and deployment
- Constant metrics on innovation performance

The Biothreat Problem

● 2 Homeland Security Biothreat Programs

- NIH: \$1.7b '03 program independent of DHS
- DHS: smaller DHS S&T program

● DHS goal: Collaborative R&D w/Biopharmas

- DSB: of 57 leading biothreats, only 1 countermeasure
- Biotechs and pharmas make medicines, not researchers -- have to enlist industry if we want countermeasures
- Defense contractor R&D model won't work: average operating margins of 15 leading biopharmas 3 times the op. margins of defense contractors
- High risk, capital intensive co's, needing big returns

Biothreat Problem, Con't.

● **Need a Biothreats Industry**

- Just doing R&D doesn't solve the problem, need companies producing FDA-approved products
- Want industry putting billions of its own \$ at risk

● **Robust market incentives**

- There is no biothreat market unless there is a national disaster – have to have market substitutes
- Need new market incentive tools: assured purchase orders, tax and capital incentives, patent extensions, liability waivers, etc.
- Bioshield not enough (5 year and commercial limits)