

Government Perspectives on Engineering Systems

Opening remarks by:

M. Granger Morgan
Head, Department of
Engineering and Public Policy
Carnegie Mellon University
412-268-2672
granger.morgan@andrew.cmu.edu



Before I introduce...

... the speakers in this session, I'd like to take a moment to tell you about an activity that a number of us across the S&T policy community have undertaken to promote improved science and technology advice to the US Congress.



In June of 2001

We ran a large formal workshop in Washington with the objective of starting a national conversation on the question:

What institutional arrangements are needed to better provide balanced independent scientific and technical advice to the Congress on large-scale questions which require foresight, analysis and synthesis?





That workshop was coordinated through the Department of Engineering and Public Policy at Carnegie Mellon University and is co-convened by:

American Association for the Advancement of Science (AAAS)
American Association of Engineering Societies (AAES)
American Society of Mechanical Engineers (ASME)
Association for Computing Machinery (ACM) - US Public Policy Committee
Center for Science, Policy and Outcomes, Columbia University
College of Engineering, University of Florida
Consortium of Social Science Associations (COSSA)
Engineering Systems Division at MIT
H. John Heinz III Center for Science, Economics and the Environment
Institute of Electrical and Electronics Engineers-USA (IEEE-USA)
Kennedy School of Government at Harvard
Management Science and Engineering at Stanford
Resources for the Future
School of Public Policy at George Mason University
Sigma Xi, (the Scientific Research Society)
Society for Risk Analysis (SRA).

Financial support for that workshop came from:
The Heinz Endowments;
The John D. and Catherine T. MacArthur Foundation; and
Carnegie Mellon University.

A summary...

...of the workshop
is available on line
at the web address
below.



Creating an Institutional Structure to Provide Science and Technology Advice to the U.S. Congress

Briefing notes on a workshop, Washington, D.C., June 14, 2001

What was the question?

The workshop asked what new institutional arrangements (if any) are needed to better provide balanced, independent scientific and technical advice to the Congress on large-scale questions which require foresight, analysis and synthesis? Convened by a group of eighteen leading professional societies, universities, and think tanks (see list on page 4), the workshop's objective was to start a serious national discussion on this topic.

Why is this an issue?

Assuring the future safety of air travel, balancing the risks and benefits of genetically modified crops, preparing for the day when telephone service shifts from the regulated phone system to the unregulated internet - the list of topics on the Congressional agenda that involve complex issues in science and technology grows ever longer and more challenging. The problem is not lack of information. Congress is deluged with facts, and with the partisan pleadings of thousands of interested parties. But information is not knowledge. For more complex issues, especially those involving science and technology, Congress and its committees need more than bare facts and brief interactions with technical experts - they need balanced analysis and synthesis. On such complex technical subjects, sorting, integrating, and analyzing information in order to frame the issues, and extract knowledge and insight, requires much more time and expertise than most Members, or their staffs, have available. On May 10, 2001, in a lead editorial, the international scientific journal *Nature* asserted that "the US legislature is bereft of objective guidance on issues that underpin much of its work."

Who participated in the workshop?

Over 100 Congressional staffers, policy analysts, and academic and industry leaders participated. In a kick-off breakfast discussion on the Hill, House Science Chairman Sherwood Boehlert (R-NY), along with Congressmen Vernon Ehlers (R-MI), Rush Holt (D-NJ), and Amo Houghton (R-NY) discussed the issues at length. While unable to participate because of schedule conflicts, Senators John D. Rockefeller IV (D-WV) and Ted Stevens (R-AK) sent supporting letters. In his letter, Senator Stevens noted that "there is great need for balanced analysis to assist the Congress as it addresses complex, large-scale issues involving science and technology."

What insights came out of the workshop?

While the workshop made no attempt to reach a formal consensus, participants largely shared the following insights and conclusions.

General:

- The problems with which the Congress must deal are becoming increasingly complex. Science and technology play an ever more central role in a host of problems in energy, defense, medicine, agriculture, biotech, telecommunications, environment, aviation, research policy, and a host of other areas.
- The problem is not lack of information. Congress is deluged with facts. What is needed is balanced non-partisan analysis and synthesis which sorts, integrates, and analyzes information in order to frame the issues, extract knowledge and insight, and lay out the range of policy options.

Specific:

- Congress needs a better source of balanced independent scientific and technical policy analysis to assist it with large-scale questions which require foresight, analysis, and synthesis. None of the current sources adequately serve the need.
- Congress is a representative body that responds to its constituents. If the Congress is going to create better ways of getting balanced technical advice, outside constituents will have to make the case that such a capability is sorely needed, and that its presence will lead to more informed decision making that better serves the public interest.
- The need for improved analysis is probably best served by an organization that is located inside the Legislative Branch, and works exclusively for the Congress. Such an organization should draw upon the special expertise of outside organizations such as universities and non-profit think tanks.
- The cost of such an analytical capability would be very modest when compared with the total budget of the Legislative Branch or with the costs associated with the decisions it would support.
- While the existing legal framework for the former Office of Technology Assessment - including control by a bipartisan bicameral committee - could be used to establish such a capability, some improvements should be made with respect

Continued on pg. 3

http://www.epp.cmu.edu/other/STadvice_toC.html

Cambridge MA 2004 March 29

Congress needs...

...several types of scientific and technical advice and information.

Members and Committees need facts and figures which can be obtained from many sources including the Congressional Research Service.

They need direct contact with technical experts through formal hearings, informal meetings, and seminars.

They get technical advice and assistance from staff experts, including Science and Technology Congressional Fellows and the Congressional Research Service.



However...

...when it comes to longer term, and more complex issues, Congress and its Committees need more than bare facts and brief interactions with technical experts – they need balanced analysis and synthesis that is responsive to their unique needs.



Here a few examples...

...of problem domains in which Congress needs careful balanced analysis, not just facts:

- Homeland security (efficacy, cost effectiveness of alternative measures);
- Internet policy (sales taxes, internet telephony, security and privacy, digital divide, etc.);
- Regulatory improvement (better use of science, benefit-cost analysis, emissions trading, etc.);
- Genetically modified organisms (potential benefits, risk analysis, regulatory oversight, etc.);
- Arms control and defense policy (program effectiveness, R&D priorities, choice and evaluation of new weapon systems, etc.);
- Space policy (future shuttle and alternative launch vehicles, international cooperation, national security, etc.);
- Air traffic control (managing crowded facilities, free flight, safety, etc.);
- etc.

...the list goes on and on.

While Congress does get...

... balanced analysis and synthesis on such topics from a variety of sources, there is currently a gap, both in terms of:

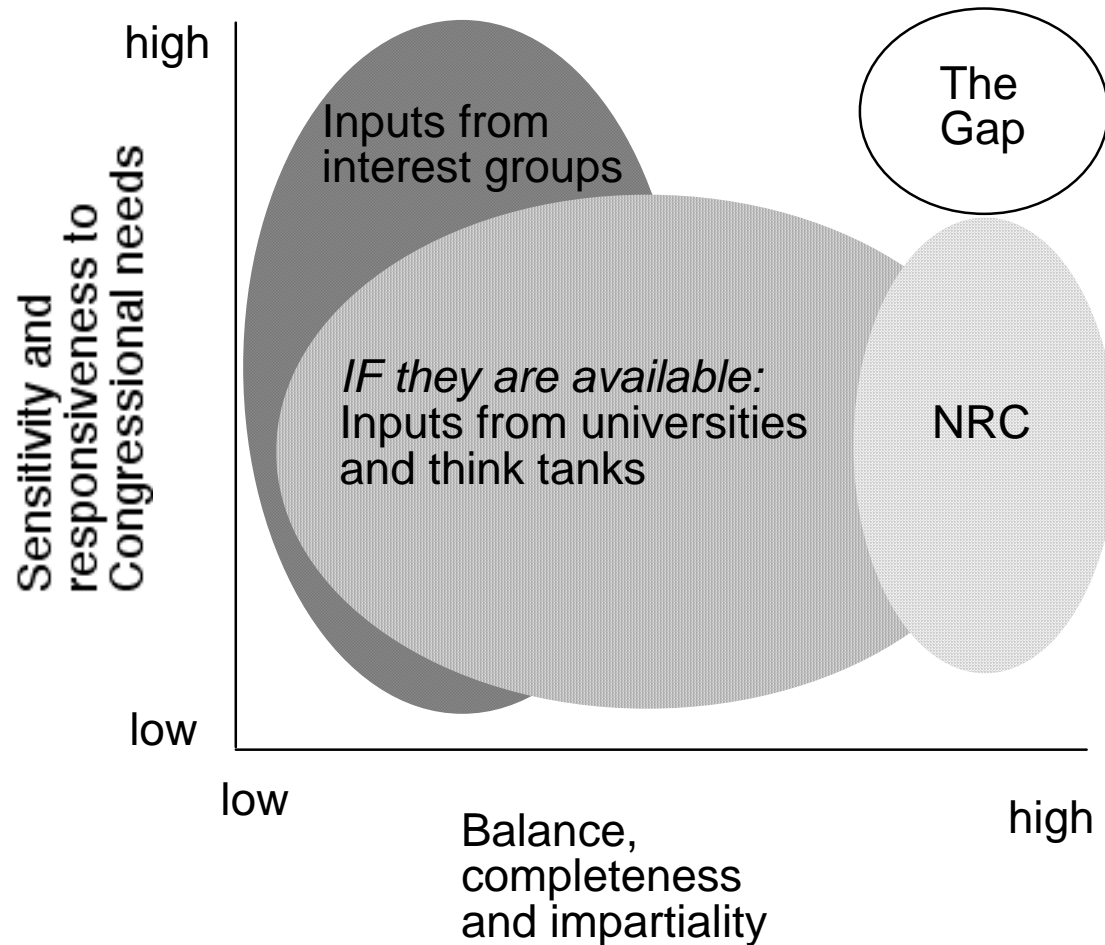
- balance and sensitivity to Congressional needs,

and in terms of

- the time it takes to respond to those needs.



Balance and sensitivity



Response time

CRS



The
Gap



NRC

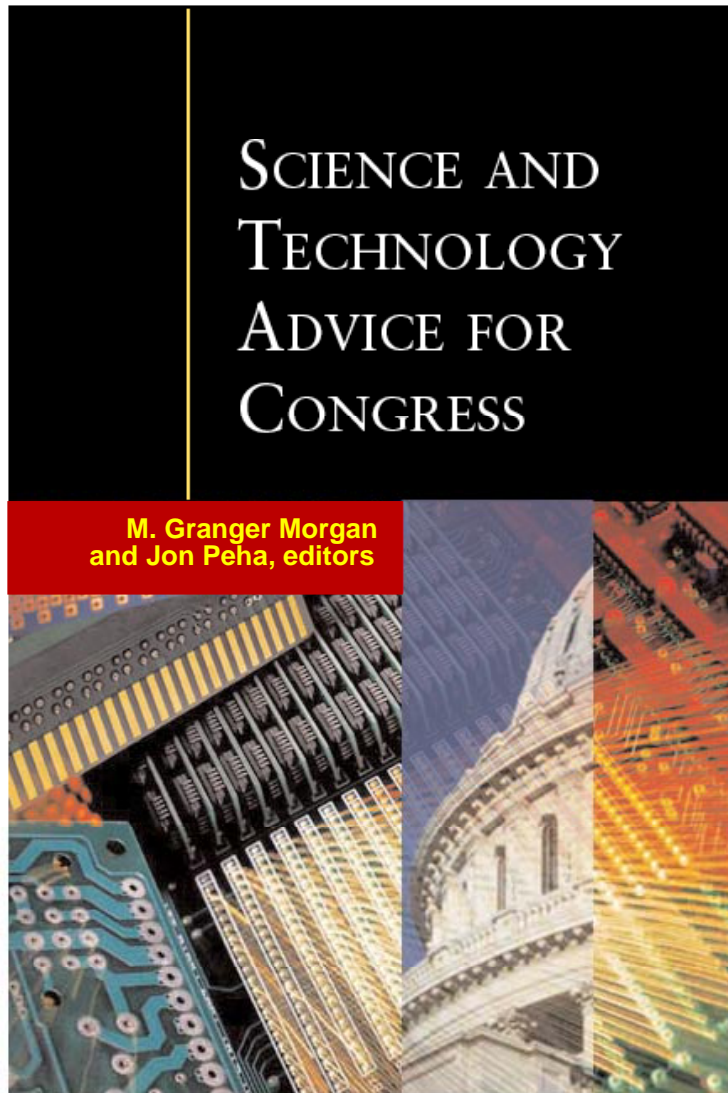


hours days weeks months years



Building on the earlier effort...

...we have recently
produced a book that
has gone to every
member of the House
and Senate.



RFF Press, 2003, 236pp

Contents

Preface vii
Contributors ix

Part I: The Issue

1. Analysis, Governance, and the Need for Better Institutional Arrangements 3
M. Granger Morgan and Jon Peha

Part II: Background

2. Technical Advice for Congress: Past Trends and Present Obstacles 23
Bruce L.R. Smith and Jeffrey K. Stine

3. The Origins, Accomplishments, and Demise of the Office of Technology Assessment. 53
Robert M. Margolis and David H. Guston

4. Insights from the Office of Technology Assessment and Other Assessment Experiences 77
David H. Guston

5. The European Experience 90
Norman J. Vig



Contents ...(Cont.)

Part III: Possible Institutional Models

6. Thinking about Alternative Models	101
M. Granger Morgan and Jon Peha	
7. An Expanded Analytical Capability in the Congressional Research Service, the General Accounting Office, or the Congressional Budget Office	106
Christopher T. Hill	
8. Expanded Use of the National Academies	118
John Ahearn and Peter Blair	
9. Expanding the Role of the Congressional Science and Engineering Fellowship Program	134
Albert H. Teich and Stephen J. Lita	
10. A Lean, Distributed Organization To Serve Congress	145
M. Granger Morgan, Jon Peha, and Daniel E. Hastings	
11. A Dedicated Organization in Congress	157
Gerard L. Epstein and Ashton B. Carter	
12. An Independent Analysis Group That Works Exclusively for Congress, Operated by a Nongovernmental Organization	164
Caroline S. Wagner and William A. Stiles Jr.	



Content...(Cont.)

Part IV: Moving toward Solution

13. Where Do We Go from Here?	173
M. Granger Morgan and Jon Peha	
Appendix 1: The Technology Assessment Act of 1972.....	183
Appendix 2: Details on the National Academies Complex	191
Appendix 3: An External Evaluation of the GAO's First Pilot Technology Assessment	208
Index.....	229
About the Editors	231



Recent Developments

There have been several recent efforts in the Congress to advance this agenda. I'll conclude by mentioning three:

First Holt Bill

Bingaman GAO initiatives

Current Holt Bill

108TH CONGRESS
2D Sesssion

H. R. _____

To provide for the establishment within the General Accounting Office of a Center for Science and Technical Assessment.

IN THE HOUSE OF REPRESENTATIVES

Mr. HOLT (for himself and Mr. BOGHR708) introduced the following bill; which was referred to the Committee on _____

A BILL

To provide for the establishment within the General Accounting Office of a Center for Science and Technical Assessment.

1 *Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,*

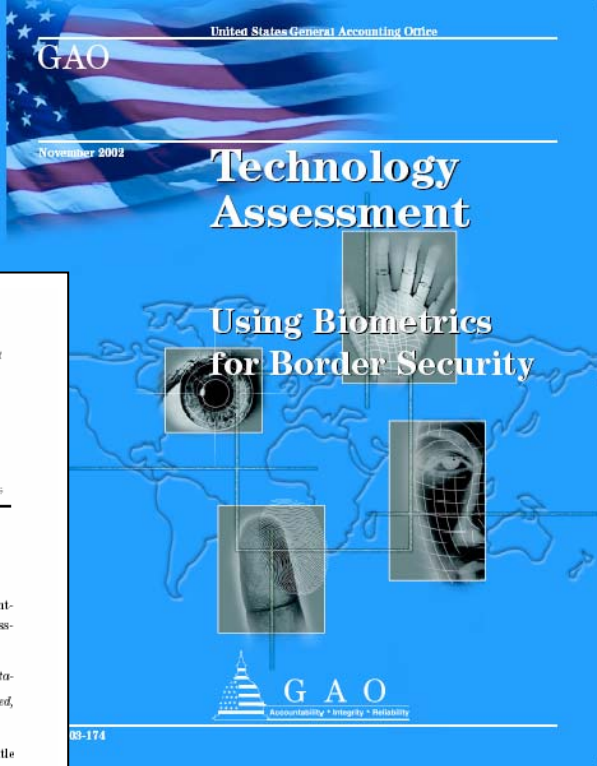
2 **SECTION 1. ESTABLISHMENT OF CENTER.**

3

4 (a) IN GENERAL.—Subchapter I of chapter 7 of title

5 31, United States Code, is amended by adding at the end

6 the following new section:



United States General Accounting Office

GAO

November 2002

Technology Assessment

Using Biometrics for Border Security

GAO
Accountability • Integrity • Reliability

03-174



Today's Session

Mortimer Downey, President, pbConsult (former US
Deputy Secretary of Transportation)

Joseph Bordogna, Deputy Director, National Science
Foundation

Mary Good, Donaghey University Professor and Dean,
University of Arkansas (former Under Secretary of
Technology, US Department of Commerce)

Lui Pao Chuen, Chief Defense Scientist, Singapore,
Chairman, Temasek Defense Systems Institute

