R&D in the President’s FY 2002 Budget

Michael Holland
May 2, 2001
Government Spending as a Share of GDP, 2000

Total Government Spending in the U.S. (28%)

- Federal Grants to State and Local Governments (2%)
- Spending from State and Local Revenues (9%)
- Spending for Direct Federal Programs (16%)

Total Federal Spending (19%)

Private 72%

Government 28%

Note: Numbers do not add due to rounding.
The President’s Proposal for FY2002

*Means-tested entitlements are those for which eligibility is based on income. The Medicaid program is also a means-tested entitlement.*
President's Proposed Allocation of the 10-year Surplus

$5.6 Trillion, 2002-2011

- Social Security Surplus: $2.6
- Maximum Debt Retirement: $2.0
- Tax Relief: $1.6
- Contingency Reserve: $1.0
- Reserve: $0.6
- Debt Service: $0.4
Moderating the Growth of Spending

Budget authority in billions of dollars

Continued Growth
6%

Continued Growth Adds $1.4 Trillion over 10 Years

Recommended Level

$26 billion above FY 2001 Enacted

Note: Six percent is average growth in budget authority over the past three years.
2002 Discretionary Spending
($ in billions)

Additions
• Campaign initiatives +15.3
• Pay & programmatic +19.0
• National Emergency Reserve +5.6
• Technical adjustments +5.6

Offsets
• Non-repetition earmarked funding -4.3
• Non-repetition one-time funding -4.1
• Program decreases -11.5

Net Increase +25.7 (4.0% increase)
### Campaign Initiatives

($ in billions)

- Strengthen and Reform Education  
  \(+3.6\)
- Revitalize National Defense  
  \(+4.4\)
- Invest in Health Care  
  \(+2.9\)
- Comprehensive Energy Policy & Protect Environment  
  \(+1.4\)
- Combat Crime and Drug Abuse  
  \(+1.4\)
- Champion Compassionate Conservatism  
  \(+0.7\)
- Assist Americans with Disabilities  
  \(+0.3\)
- Strengthen Families  
  \(+0.3\)
- Reform the Immigration System  
  \(+0.2\)
- Promote Volunteerism  
  \(+0.2\)

**Total**  
\(+15.3\)
National R&D Spending

National R&D Investment is Strong

G-7 National R&D Investment

U.S. National R&D spending in 1998 was greater than the combined R&D spending of the other G-7 countries

Source: National Science Foundation
National R&D Spending

National R&D Investment is Strong
...and Getting Stronger

R&D Spending 1981-1998

Source: National Science Foundation
National R&D Spending
Increase Is Due Mostly to Private Sector

(Increase Shown from 1993-1999)

Source: National Science Foundation

Bar chart showing the percentage of national R&D spending in billions of nominal dollars from 1993-1999, categorized by sector (Private and Federal) and type of research (All R&D, Basic Research, Applied Research).
Private Sector R&D
Private Share of Total Has Increased Dramatically

Source: National Science Foundation
R&D a Clear Priority
Federal R&D Proposal Outpaces All Other Discretionary Programs

Increases in Budget Authority 2001-2002

- Basic Research: 6.1%
- All R&D: 5.8%
- All Discretionary Spending: 4.0%
Federal R&D in 2002
An All-Time High

<table>
<thead>
<tr>
<th></th>
<th>2001 Estimate</th>
<th>2002 Proposed</th>
<th>Percent Change: 2001 to 2002:</th>
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<tbody>
<tr>
<td>Basic Research</td>
<td>22,018</td>
<td>23,352</td>
<td>6%</td>
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<tr>
<td>Applied Research</td>
<td>20,734</td>
<td>21,553</td>
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<tr>
<td>Development</td>
<td>42,594</td>
<td>45,954</td>
<td>8%</td>
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<td>R&amp;D Facilities and Equipment</td>
<td>4,664</td>
<td>4,394</td>
<td>-6%</td>
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<tr>
<td>Total</td>
<td>90,010</td>
<td>95,253</td>
<td>6%</td>
</tr>
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</table>
Historical R&D Priorities
(obligations, in 1996 constant dollars)

Source: National Science Foundation
R&D Balance

In Addition to Life Sciences, Other Disciplines Have Done Well
## FY 2002 R&D Highlights

### Important Priorities within the Agency Totals

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>NIH</td>
<td>Biomedical research</td>
<td>20,361</td>
<td>23,112</td>
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<td>DOD</td>
<td>R&amp;D initiative</td>
<td>0</td>
<td>2,600</td>
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<td>NASA</td>
<td>Space Launch Initiative</td>
<td>290</td>
<td>475</td>
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<td>Astronomical Search for Origins</td>
<td>123</td>
<td>194</td>
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<td>NASA</td>
<td>Earth Observing System Follow-on Program</td>
<td>55</td>
<td>130</td>
<td>136%</td>
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<td>NSF</td>
<td>Math and Science Partnership Initiative</td>
<td>0</td>
<td>200</td>
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<td>NSF</td>
<td>Mathematical Sciences</td>
<td>121</td>
<td>141</td>
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<td>NSF</td>
<td>Nanoscale Science, Engineering and Technology</td>
<td>150</td>
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<td>USDA</td>
<td>Biotechnology</td>
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<td>Bioproducts and Bioenergy</td>
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<tr>
<td>DOC</td>
<td>Ocean Exploration</td>
<td>4</td>
<td>14</td>
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<td>National Polar-orbiting Operational Environmental Satellite</td>
<td>73</td>
<td>157</td>
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<td>NIST internal research</td>
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<tr>
<td>DOT</td>
<td>Highway Surface Transportation</td>
<td>73</td>
<td>114</td>
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<tr>
<td>DOT</td>
<td>Intelligent Transportation Systems Initiative</td>
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<td>62</td>
<td>51%</td>
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<td>Education</td>
<td>National Institute on Disability and Rehabilitation Research</td>
<td>100</td>
<td>110</td>
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<td>Networking and Information Technology Research and Development*</td>
<td>1,929</td>
<td>1,969</td>
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<tr>
<td>Nanoscale Science, Engineering and Technology*</td>
<td>446</td>
<td>482</td>
<td>8%</td>
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* Note: Final DoD R&D funding levels will be based on results of a Defense strategy review, currently underway. DoD FY 2002 R&D projections shown are extrapolated from FY 2001 appropriated levels, adjusted for inflation.
Earmarks to Universities & Colleges
Increasing at Alarming Rate, Undermining Competitive, Merit-Based Efforts

Source: Chronicle of Higher Education
R&D Budget Summary

• Spurs Private R&D investments
  -- R&E Tax Credit

• Sets Federal R&D as Priority
  -- 6% growth (vs. 4% discretionary growth)

• Establishes commitment to health research
  -- Doubles NIH by FY 2003

• Addresses Math/Science Education Needs
  -- at least $1 Billion over five years
R&D by OMB PAD

% BA, FY 2001

- NRP: $80.7B
- HRP: $111.8B
- GGP: $90.5B
- NSP: $340.6B

Categories:
- F S&T
- Other R&D
- Non R&D
R&D Policy Issues for FY 2003 and Beyond

• What does “Balance” mean?
  – There will always be national priorities.

• How do policy officials know when the portfolio is balanced?

• What are the decision rules for adding new resources? Can we come up with “Raines Rules” for basic and applied research (see attached)?
“Raines Rules” for IT Investment

IT Investments must:

• Support core/priority mission functions,
• Be undertaken because no alternative private sector or govt. source can efficiently support the function,
• Support work processes that have been redesigned to reduce cost, improve effectiveness and make maximum use of off-the-shelf technology,
• Demonstrate a projected return on investment that is clearly equal to or better than alternative uses of public resources
• Be consistent with existing architectures,
• Be implemented in a manner that reduces risk,
• Be implemented in phased chunks, each with independent benefits, and
• Employs a performance-based acquisition strategy that appropriately allocates risk between govt. and contractor.