6. PROMOTING RESEARCH

I ask you to simply imagine that new century full of its promise, molded by science, shaped by technology, powered by knowledge. These potent transforming forces can give us lives fuller and richer than we have ever known... If we are to make the most of this century, we—all of us, each and every one of us, regardless of our background—must work to master these forces with vision and wisdom and determination. The past half-century has seen mankind split the atom, splice genes, create the microchip, explore the heavens. We enter the next century propelled by new and stunning developments.

President Clinton
May 1997

Scientific and technological advances have left few facets of life untouched. Great leaps in the speed and economy of transportation, enormous increases in farm productivity, global flows of information and services, advances in health treatment and prevention and in environmental protection—all these changes have created a world at the dawn of the 21st Century that is vastly different from the world our grandparents knew. As numerous studies show, technological innovation and scientific discovery have been responsible for at least half of the Nation's productivity growth in the last 50 years, generated millions of high-skill, high-wage jobs, and substantially improved the quality of life in America.

The Federal Government has played an important role in spurring and sustaining this scientific and technological advance. Among other feats, Government-sponsored research and development (R&D) has put Americans on the moon, explored the oceans, harnessed the atom, devised more effective treatments for cancers, found the remains of lost civilizations, tracked weather patterns and earthquake faults, and discovered the chemistry of life. No other country in history can match America's record of achievement in science and technology.

Because these investments have paid such rich dividends, and because the next century will bring new challenges, opportunities, and problems that science and technology can help address, continued U.S. leadership in science and technology is a cornerstone of the President's and the Vice President's vision for America. Thus, the budget strengthens these vital investments, contributing substantially to many of the Administration's broader goals by creating new knowledge, training more workers, catalyzing new jobs and industries, addressing health challenges, enhancing our understanding of and ability to address environmental problems, improving the education of our children, and maintaining a strong national defense. The centerpiece of the Administration's continuing commitment is the proposed Research Fund for America, from which many of the research dollars will now flow.

But Federal funds are not limitless. Thus, agencies are working to make smarter, better science and technology investments, guided by two fundamental principles.

- First, agencies are focusing on potentially high-payoff research that could have substantial public benefit, but is too high-risk or long-term for the private sector. The Federal Government, in partnership with States, universities, and industry, supports a balanced mix of basic and applied research and technology development, given that scientific discovery and technological innovation are intricately interwoven. The Federal Government also supports international partnerships that benefit our scientists, leverage our investments, and address complex, global problems.

- Second, agencies are focusing more on the performance and results of science and technology investments, rather than just dollars spent. They are also pursuing improvements in efficiency, where possible, through innovations in government laboratories, university grants, and private contracts.

Research Fund for America

The budget proposes a Research Fund for America—reflecting the President's commitment to ensuring long-term stability and growth for non-defense research programs—that will support a wide range of Federal science and technology activities. The budget proposes $31 billion for the Fund, representing an eight-percent increase for these programs over the 1998 level and a 32-percent increase by 2003 (see Chart 6–1 and Table 6–1).

National Institutes of Health (NIH): The Fund supports an unprecedented commitment to biomedical research, laying the foundation for new innovations to improve health and prevent disease. It provides an increase of $1.15 billion for the National Institutes of Health (NIH), the largest ever, to a proposed $14.8 billion funding level that will support greater research on diabetes, brain disorders, cancer, drug demand reduction, genetic medicine, disease prevention strategies, and the development of an AIDS vaccine.

NIH's highest priority continues to be investigator-initiated, peer-reviewed research project grants. To ensure that the United States continues to invest heavily in biomedical research, the budget proposes, for the first time, sustained increases for the NIH over five years. By the year 2003, funding for biomedical research would increase to over $20 billion, or by nearly 50 percent.

Climate Change Technology Initiative (CCTI): The Fund includes a five-year research and technology initiative to reduce the Nation's emissions of greenhouse gases. Led by the Energy Department (DOE) and the Environmental Protection Agency (EPA), the effort also includes activities of the National

Chart 6-1. RESEARCH FUND FOR AMERICA

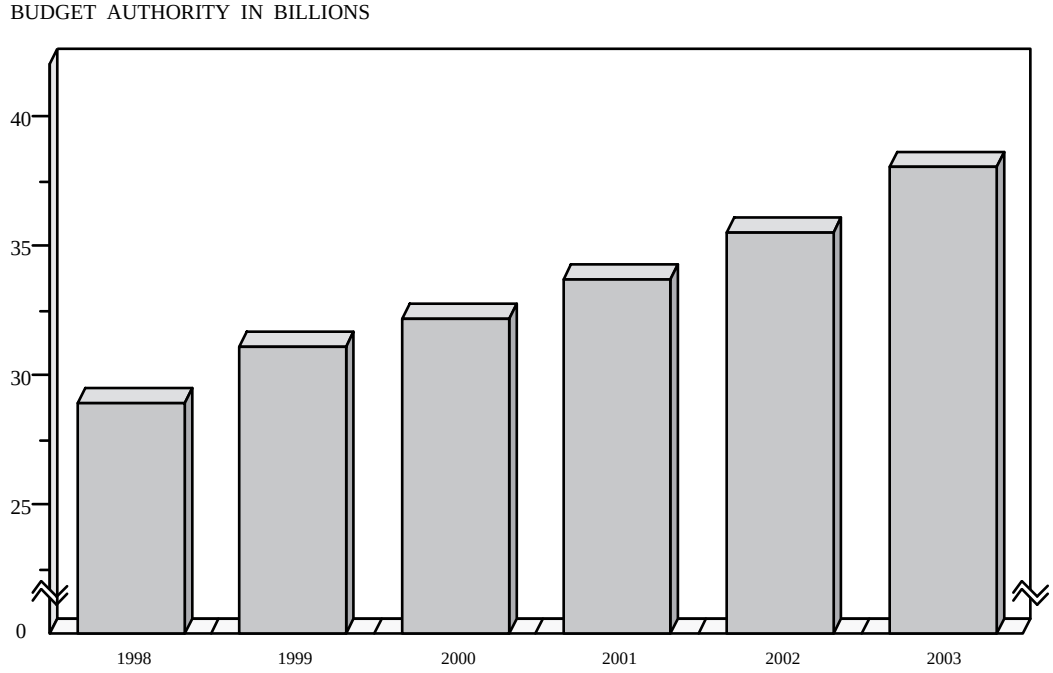

Table 6–1. RESEARCH FUND FOR AMERICA

(Budget authority, dollar amounts in millions)

	1998 Estimate	1999 Proposed	2003 Proposed	Percent Change: 1998 to 1999	Percent Change: 1998 to 2003
Health and Human Services:					
National Institutes of Health	13,648	14,798	20,188		
Agency for Health Care Policy and Research	.....	46	56		
Centers for Disease Control and Prevention	.....	25	30		
Agency total	13,648	14,869	20,274	+8%	+48%
National Science Foundation (NSF)[1]	3,366	3,710	4,183	+10%	+24%
Department of Energy:					
Science Program	2,236	2,296	2,420		
Fusion Research	232	228	200		
National Spallation Neutron Source	.....	157	195		
Agency total	2,468	2,681	2,815	+9%	+14%
National Aeronautics and Space Administration:					
Space Science	2,034	2,058	2,568		
Earth Science	1,417	1,372	1,407		
Advanced Space Transportation Technology	417	389	490		
Aeronautics Research and Technology	920	786	775		
Agency total	4,788	4,605	5,240	–4%	+9%
Department of Agriculture:					
CSREES Research and Education	430	423	423		
Economic Research Service	53[3]	56	56		
Agricultural Research Service (ARS)	745	770	770		
Forest Service Research	188	195	195		
Agency total	1,416	1,444	1,444	+2%	+2%
Department of Commerce:					
Oceanic and Atmospheric Research	278	251	251		
National Institute of Standards and Technology[2]	563	600	689		
Agency total	841	851	940	+1%	+12%
Department of Interior: U.S. Geological Survey	759	807	796	+6%	+5%
Environmental Protection Agency: Office of Research and Development	538	487	578	–9%	+7%
Department of Veterans Affairs: Medical Research	272	300	300	+10%	+10%
Department of Education: Education Research	.....	50	50	NA	NA
Climate Change Technology Initiative:					
Energy	729	1,060	1,144		
Environmental Protection Agency	90	205	241		
Housing and Urban Development	.....	10	.....		
Agriculture (ARS and Forest Service)	.....	10	21		
Commerce	.....	7	8		
Multi-agency total	819	1,292	1,414	+58%	+73%
Total	**28,915**	**31,096**	**38,034**	**+8%**	**+32%**

[1] NSF data excludes $63 million per year in Function 054, Defense-related activities.

[2] Does not include Manufacturing Extension Partnership.

[3] Excludes transfer in 1999 of research function from Agriculture Department feeding programs.

Institute of Standards and Technology (NIST) and the Departments of Agriculture (USDA) and Housing and Urban Development (HUD). The budget proposes a combined $2.7 billion increase over five years for these agencies for R&D on energy efficiency, renewable energy, and carbon-reduction technologies. The budget also proposes $3.6 billion in tax incentives over five years to stimulate the adoption of more efficient technologies in buildings, industrial processes, vehicles, and power generation.

An example of efforts to develop breakthrough technologies to cut greenhouse gases and improve energy efficiency is the Partnership for a New Generation of Vehicles—a Government-industry effort to develop an attractive, affordable car that meets all applicable safety and environmental standards and is up to three times more fuel efficient than today's cars, reaching roughly 80 miles per gallon. The budget proposes a similar Government-industry effort to develop more efficient heavy truck engines. Other key parts of the CCTI are Government-industry partnerships on energy-efficient technologies for commercial buildings and homes; stronger labeling and efficiency requirements for appliances and office equipment; the deployment of new technologies in the industrial sector to capture waste heat and convert it into electricity; and R&D spending and incentives for renewable energy sources like biomass, wind, photovoltaics, and fuel cells (See Tables 6–2 and 6–3)

National Aeronautics and Space Administration (NASA): The Fund supports several ongoing activities, including: $2.1 billion for Space Science, a program that has outperformed all expectations in 1997 with the highly successful Mars Pathfinder mission; $1.4 billion for Earth Science (formerly Mission to Planet Earth), which explores the influence of natural processes and human activities on the environment, and which will launch the first of NASA's new generation of Earth Observing System Satellites, known as AM–1, in 1998; $389 million for Advanced Space Transportation Technology, including funds for the X–33 and X–34 reusable launch vehicle technology demonstrations; $786 million for NASA's Aeronautics Research and Technology programs, including Aviation Safety R&D; and $760 million in future-year funds to support launch vehicles that would lower NASA's launch costs.

National Science Foundation (NSF): The Fund provides $3.7 billion, 10 percent more than in 1998, for NSF, whose broad mission is to promote science and engineering research and education across all fields and disciplines. NSF supports nearly half of the non-medical basic research conducted at academic institutions, and provides 30 percent of Federal sup-

Table 6–2. CLIMATE CHANGE TECHNOLOGY INITIATIVE (AGENCIES)

(In millions of dollars)

Selected Agencies	1997 Actual	1998 Estimate	1999 Proposed	Dollar Change: 1998 to 1999	Dollar Change: 1999 to 2003
Discretionary Budget Authority:					
Energy	657	729	1,060	+331	+1,899
Environmental Protection Agency	86	90	205	+115	+677
Housing and Urban Development	.....	.....	10	+10	+10
Agriculture	.....	.....	10	+10	+86
Commerce	.....	.....	7	+7	+38
Subtotal, budget authority	743	819	1,292	+473	+2,710
Tax Incentives	.....	.....	421	+421	+3,635
Total Initiative	**743**	**819**	**1,713**	**+894**	**+6,345**

Table 6–3. CLIMATE CHANGE TECHNOLOGY INITIATIVE (SECTORS)

(In millions of dollars)

Key Sectors	1998 Estimate	1999 Proposed	Dollar Change: 1998 to 1999
Discretionary Budget Authority:			
Buildings	146	264	+118
Industry	156	216	+60
Transportation	246	356	+110
Electricity	220	332	+112
Carbon Sequestration and Cross-Cutting Research	.....	42	+42
Policy Analysis, Market Incentives	6	26	+20
Program Direction	45	57	+12
Total	**819**	**1,292**	**+473**

port for mathematics and science education. Because most NSF awards go to colleges and universities, they not only generate knowledge, they also train the next generation of scientists and engineers.

Department of Energy: The Fund provides the resources for DOE's science research and nuclear fusion programs, for constructing the National Spallation Neutron Source, for the international partnership on the Large Hadron Collider, and for DOE research under the Climate Change Technology Initiative (discussed earlier in this chapter).

Department of Agriculture: The Fund provides $777 million for the Agricultural Research Service, $33 million more than in 1998, and $56 million for the Economic Research Service, which conduct a broad range of food, farm, and environmental research programs. The budget also provides $423 million for Cooperative State Research, Education, and Extension Service (CSREES) programs, including $130 million for the National Research Initiative, a 34 percent increase over the 1998 level. CSREES provides grants for agricultural, food, and environmental research, and for higher education. National Research Initiative competitive research grants improve the quality and increase the quantity of USDA's farm, food, and environmental research. The budget proposes a Food Genome Initiative to expand efforts to understand the genomes of important plants, animals, and microbes. In addition, it increases funding for the Forest Service's Forest and Rangeland Research program to conduct research on sensitive and complex natural resource management issues, forest health restoration, wildland fire fuels reduction, wildlife habitat restoration, alternative uses of forest and rangeland resources, and inventory and monitoring methods.

Department of Commerce's NIST: The Fund provides $260 million for NIST's Advanced Technology Program (ATP), growing to $399 million by 2003, to promote unique, rigorously competitive, cost-shared R&D partnerships between Government and private industry to more quickly develop high-risk technologies that promise significant commercial payoffs and widespread economic benefits. The Fund also provides $340 million for NIST's Standards and Technology Laboratories, including $300 million for ongoing programs and new initiatives in disaster mitigation, semiconductors, and trade-related standards and $40 million to build an Advanced Measurement Laboratory on the NIST campus in Gaithersburg, Md.

Department of Commerce's National Oceanic and Atmospheric Administration/ Office of Oceanic and Atmospheric Research (OAR): The Fund provides $251 million for OAR to conduct research to provide the scientific basis for national policy decisions in areas such as climate change, air quality, and stratospheric ozone depletion, as well as

research to promote economic growth through efforts in marine biotechnology and environmental technologies.

Department of the Interior's U.S. Geological Survey (USGS): The Fund provides $807 million for science that directly supports natural resource and environmental decision making. Increases for USGS support research on pollutant transport in ground water; enhanced understanding of species habitat; and improved monitoring of water quality, species habitat, and natural hazards. USGS plans to use its mapping, remote sensing, and natural resources monitoring capabilities to develop new ways to improve the availability and dissemination of domestic natural disaster hazards information, as well as to support NASA's Earth Observing System satellites.

EPA: The Fund provides $487 million for EPA's Office of Research and Development (ORD), which performs most of EPA's research and provides a sound scientific and technical foundation for environmental policy and regulatory decision-making. ORD also provides technical support to EPA's mission, integrates the work of its own scientific partners, and provides leadership in addressing emerging environmental issues.

Department of Veterans Affairs' Medical Research: The Fund provides $300 million—about a third of the Department's overall research program of nearly $1 billion—for clinical, epidemiological, and behavioral studies across a broad spectrum of medical research disciplines.

Department of Education: The Fund includes $50 million a year for five years for the Education Research Initiative, a partnership between the Education Department and the National Science Foundation—consistent with recommendations by the President's Committee of Advisors on Science and Technology, the National Academy of Education, and the National Research Council's Committee on the Federal Role in Education Research. The initiative will support large-scale research focused on the best approaches to raising student achievement through, for example, learning technologies and innovative approaches to reading and mathematics instruction that take advantage of the latest research findings on brain function and learning.

Department of Health and Human Services' (HHS) Agency for Health Care Policy and Research (AHCPR): The Fund provides $46 million for AHCPR to support research on the outcomes and effectiveness of clinical treatments, health care quality, and the organization, financing, and delivery of health care. AHCPR works primarily through peer-reviewed grants to academic health centers, universities, and non-profit research organizations.

HHS' Centers for Disease Control and Prevention (CDC): The Fund includes a $25 million increase for CDC's population-based research activities to provide new peer-reviewed grants that will enable academic centers to perform population-based research to help prevent diabetes, heart disease, workplace injuries, and cancers.

Science and Technology Highlights

Federal investments in science and technology contribute to the Administration's economic, educational, health, environmental, and national security goals. Along with programs of the Research Fund for America, the budget proposes increases for a host of other important activities. (For total Federal R&D funding, see Table 6–4; for science and technology highlights, see Table 6–5.)

Increasing Total Support for Science and Technology: The budget marks the sixth straight year that the President has proposed increases in R&D—at $78.2 billion, $2 billion or three percent more than in 1998. The budget also provides an increasing share for civilian R&D investments, which comprise 48 percent of the total.

Boosting Funding for Basic and Applied Research: The budget proposes $17 billion for basic research and $16.4 billion for applied research—increases of $1.2 billion and $848 million, respectively, over 1998. These investments, which include increases of nine percent for NIH, 11 percent for NSF, and 11 percent for DOE, reflect the Administration's commitment to obtaining knowledge that will provide future economic and social benefits and improve our ability to meet economic needs without adversely affecting health and the environment.

Table 6–4. RESEARCH AND DEVELOPMENT INVESTMENTS

(Budget authority, dollar amounts in millions)

	1997 Actual	1998 Estimate	1999 Proposed	Dollar Change: 1998 to 1999	Percent Change: 1998 to 1999
By Agency:					
Defense	37,238	37,430	37,010	–420	–1%
Health and Human Services	12,941	13,836	15,136	+1,300	+9%
National Aeronautics and Space Administration	9,348	9,752	9,501	–251	–3%
Energy	6,234	6,477	7,174	+697	+11%
National Science Foundation	2,463	2,607	2,893	+286	+11%
Agriculture	1,562	1,559	1,552	–7	+*%
Commerce	978	1,079	1,080	+1	+*%
Transportation	612	676	775	+99	+15%
Interior	592	609	631	+22	+4%
Environmental Protection Agency	564	637	631	–6	–1%
Veterans Affairs	588	608	670	+62	+10%
Other	883	928	1,106	+178	+19%
Total	74,003	76,198	78,159	+1,961	+3%
By R&D Type:					
Basic Research	15,017	15,773	16,966	+1,193	+8%
Applied Research	14,393	15,553	16,401	+848	+5%
Development	42,352	42,474	42,161	–313	–1%
Equipment	688	721	837	+116	+16%
Facilities	1,553	1,677	1,794	+117	+7%
Total	74,003	76,198	78,159	+1,961	+3%
By Civilian Theme:					
Basic Research	13,927	14,673	15,811	+1,138	+8%
Applied Research	10,348	11,244	11,772	+528	+5%
Development	7,896	8,010	8,229	+219	+3%
Equipment	542	577	693	+116	+20%
Facilities	1,243	1,252	1,318	+66	+5%
Subtotal	33,956	35,756	37,823	+2,067	+6%
By Defense Theme:					
Basic Research	1,090	1,100	1,155	+55	+5%
Applied Research	4,045	4,309	4,504	+195	+5%
Development	34,456	34,464	34,057	–407	–1%
Equipment	146	144	144	.....	.....
Facilities	310	425	476	+51	+12%
Subtotal	40,047	40,442	40,336	–106	–*%
By R&D Share:					
Defense	40,047	40,442	40,336	–106	–*%
Civilian	33,956	35,756	37,823	+2,067	+6%
Total	74,003	76,198	78,159	+1,961	+3%
Civilian (percent)	46%	47%	48%	NA	NA
R&D Support to Universities	**12,682**	**13,633**	**14,471**	**+838**	**+6%**
Merit (Peer) Reviewed R&D Programs	**21,438**	**22,689**	**24,324**	**+1,635**	**+7%**

NA = Not applicable.
* Less than 0.5 percent.

Strengthening University-Based Research: University-based research—a mixture of basic and applied science, development, equipment procurement, and facilities investment—is key to America's future. While fostering innovation and expanding the scientific frontier, university-based research also trains the next generation of scientists and engineers. The budget proposes $14.5 billion, an increase of $838 million over 1998.

Table 6–5. SELECTED PROGRAM HIGHLIGHTS

(Budget authority, dollar amounts in millions)

	1997 Actual	1998 Estimate	1999 Proposed	Dollar Change: 1998 to 1999	Percent Change: 1998 to 1999
National Aeronautics and Space Administration:					
International Space Station	2,149	2,301	2,270	–31	–1%
Department of Commerce:					
Manufacturing Extension Partnership	95	114	107	–7	–6%
National Telecom. and Info. Admin. NII Grants	21	20	22	+2	+10%
Department of Transportation:					
Intelligent Transportation System Initiative	235	326	250	–76	–23%
Flight 2000 Demonstraton Program	.....	.....	90	+90	NA
Department of Defense:					
Dual Use Applications Program/Commercial Operations and Support Savings Initiative	123	120	158	+38	+31%
Advanced Concept Technology Demonstrations	57	77	116	+39	+50%
National Science and Technology Council Initiatives:					
U.S. Global Change Research Program:					
Health and Human Services	4	4	5	+1	+25%
National Aeronautics and Space Administration	1,369	1,417	1,372	–45	–3%
Energy	109	108	113	+5	+5%
National Science Foundation	166	167	187	+20	+12%
Agriculture	57	58	59	+1	+2%
Commerce	62	62	71	+9	+15%
Interior	29	29	29	.....	.....
Environmental Protection Agency	14	15	21	+6	+40%
Smithsonian	7	7	7	.....	.....
Tennessee Valley Authority	1	.....	.....	.....	.....
Subtotal	1,818	1,867	1,864	–3	–*%
Large Scale Networking and High-end Computing and Computation: [1]					
Defense	.....	.....	187	NA	NA
Health and Human Services	.....	.....	107	NA	NA
National Aeronautics and Space Administration	.....	.....	91	NA	NA
Energy	.....	.....	128	NA	NA
National Science Foundation	.....	.....	310	NA	NA
Commerce	.....	.....	22	NA	NA
Environmental Protection Agency	.....	.....	5	NA	NA
Subtotal	.....	.....	850	NA	NA
Partnership for a New Generation of Vehicles	234	227	277	+50	+22%
Emerging Infectious Diseases	314	339	370	+31	+9%

NA = Not applicable.

*Less than 0.5 percent.

[1] Meaningful comparisons between 1999 and earlier years are not possible because of significant program restructuring.

Protecting Human Health: The budget reflects the Administration's continued focus on R&D to protect human health. It funds merit-based, peer-reviewed research programs at the NIH that have made the United States the world's leader in medical research, and it also supports the development of an AIDS vaccine, the fight against emerging infectious diseases, research on cancer, efforts to reduce the demand for drugs, and a food safety initiative.

Investing in Innovation to Create New Jobs and Industries: Many of the new jobs created under this Administration have been high-tech, high-wage jobs in industries like biotechnology and computing. The budget maintains a strong investment in technology to foster these high-priority, civilian science

and technology industries and jobs. Along with funding the ATP program as part of the Research Fund for America, the budget continues funding for Manufacturing Extension Partnerships to help small businesses become more competitive by adopting modern technologies and production techniques, and for high performance computing research.

Investing in Environmental Research: Environmental research is critical for developing the scientific understanding and technological tools to allow the Nation to enhance environmental quality for current and future generations. The budget supports vital research on safe and clean food, air, and water, and on ecosystem management, biological diversity, and ozone depletion. The budget increases support for energy efficiency and renewable energy programs, and for programs to help us understand, prepare for, and mitigate the effects of changing climate conditions and natural disasters. These investments provide a scientific basis for developing cost-effective environmental policies, create the knowledge base for citizens to make wise environmental decisions, and enable new and better approaches to environmental protection.

Investing in a 21st-Century Education: Information technology has revolutionized America's businesses, but has not yet had as profound an effect in America's classrooms. Through the President's Education Technology Initiative, the Federal Government is helping to ensure that America's classrooms are equipped with modern computers and connected to the Internet, that educational software becomes an integral part of the curriculum, and that teachers will be ready to use and teach with technology. Federal science and technology investments contribute to these goals; they include the Education Research Initiative—a joint Education Department and NSF partnership (described earlier in this chapter)—and NSF's activities in Knowledge and Distributed Intelligence. (For more discussion of education technology, see Chapter 1, "Investing in Education and Training.")

Investing in Research to Keep Our Nation Secure: The budget furthers the Administration's investments in defense research to ensure that our military maintains its technological superiority. The budget also supports programs to keep nuclear weapons out of the hands of terrorists, use science-based techniques to ensure the safety and reliability of our nuclear weapons stockpiles, support research in critical infrastructure protection, and promote global stability by bolstering strong international science and technology partnerships. The budget also supports the Dual Use Applications Program (DUAP), which puts commercial industry's technical know-how and economies of scale at the service of national defense.

Other Program Highlights

The Administration continues to support a wide variety of science and technology programs at individual agencies.

NASA International Space Station: With the first launch to assemble this unique orbital laboratory only a few months away, the budget includes $2.3 billion to keep subsequent assembly missions on schedule. It also includes funds in later years to minimize the risk and cost of the project. NASA is developing the Space Station with the European Space Agency, Japan, Canada, and Russia.

Department of Commerce:

Manufacturing Extension Partnership: The budget proposes $107 million for this Nationwide network of 75 centers and 300 field offices that offer technical assistance and information about the newest business practices to help the Nation's 382,000 smaller manufacturers compete more effectively, leading to stronger economic growth and job creation.

National Telecommunications and Information Administration's National Information Infrastructure Grants Program: The budget proposes $22 million for grants to fund innovative projects that demonstrate how information technology can improve the delivery of educational, health, and other social services. These grants are highly competitive and have stimulated several hundred million dollars in non-Federal matching funds.

Department of Transportation:

Intelligent Transportation System (ITS) Initiative: The budget proposes $250 million for the ITS initiative—a package of tech-

nologies to enhance the safety and efficiency of our surface transportation infrastructure. The budget includes $100 million for the Deployment Incentives program, which will begin the Nation-wide deployment of "intelligent infrastructure," such as interactive traffic signals and traveler information systems.

Flight 2000 Demonstration Program: Responding to recommendations of the White House Commission on Aviation Safety and Security, the budget proposes $90 million for the Flight 2000 Demonstration Program, which will test and validate equipment and operating procedures over Alaska and Hawaii. The program will lead to a revolution in air traffic control known as "free-flight," which promises significant savings and will allow travelers to reach their destinations more safely, quickly, and efficiently.

Department of Defense (DOD):

DUAP and Commercial Operations and Support Savings Initiative (COSSI): The budget proposes $158 million to develop dual-use technologies and adapt cost-saving commercial technology for military uses, enabling DOD to use commercial technologies, products, and services more widely. The military services would fund most of DUAP and COSSI directly, reflecting Administration efforts to increase the services' direct involvement in all phases of the programs.

Advanced Concept Technology Demonstrations (ACTDs): The budget proposes $116 million for demonstrations to quickly harness technology and innovation for military use, at less cost. ACTDs bring technology experts and military operators together early in system development to eliminate communication barriers, improve the management of development programs, and address key warfighter challenges. ACTDs focus on three key objectives: to evaluate the military utility of new technology applications before committing to buy them; to develop corresponding battlefield operation concepts and doctrine in order to use new capabilities as wisely as possible; and to provide new capabilities to combat forces. Forty ACTDs are now under way, while six have been completed.

National Science and Technology Council Interagency Initiatives

Science and technology is a primary focus of many Federal agencies. The National Science and Technology Council provides the management oversight that will ensure efficient and effective inter-agency coordination for key science and technology initiatives that involve multiple agencies, such as:

U.S. Global Change Research Program (USGCRP): The budget proposes $1.9 billion to increase understanding of climate change and variability, atmospheric chemistry, and ecosystems. USGCRP results help develop climate change policies. The 1997 launch of the Tropical Rainfall Measurement Mission satellite will provide previously unavailable, detailed, and accurate rainfall measurements, filling a significant gap in our understanding of the Earth system. In 1998 and 1999, USGCRP will launch more satellites, and will focus on investigating regional climate changes.

Large Scale Networking and High-end Computing and Computation: The budget provides $850 million for this R&D effort, originally called High Performance Computing and Communications, which the Administration has restructured to focus on clearer goals, milestones, and performance measures. As part of this effort, the budget provides $110 million for the Next Generation Internet Initiative, which will create a research network that is 100 to 1,000 times faster than today's Internet, and invests in R&D for smarter, faster networks that support new applications, such as telemedicine, distance learning, and real-time collaboration.

Partnership for a New Generation of Vehicles: The budget proposes $277 million, a 22-percent increase over 1998, for this cost-shared, industry partnership, which centers on three research goals: to develop advanced manufacturing techniques; to use new technologies for near-term emissions improvements; and to develop production prototype vehicles three times more fuel-efficient than today's cars, with no sacrifice in comfort, performance, or price. Federal funding focuses mainly on the third goal. The program will lead to "concept cars" in the year 2000 and production prototypes in 2004.

Emerging Infectious Diseases: The budget proposes $370 million, nine percent over the 1998 level, for research on new tools to detect and control emerging infectious diseases and on the biology and pathology of infectious agents.