AGENCY SUMMARY

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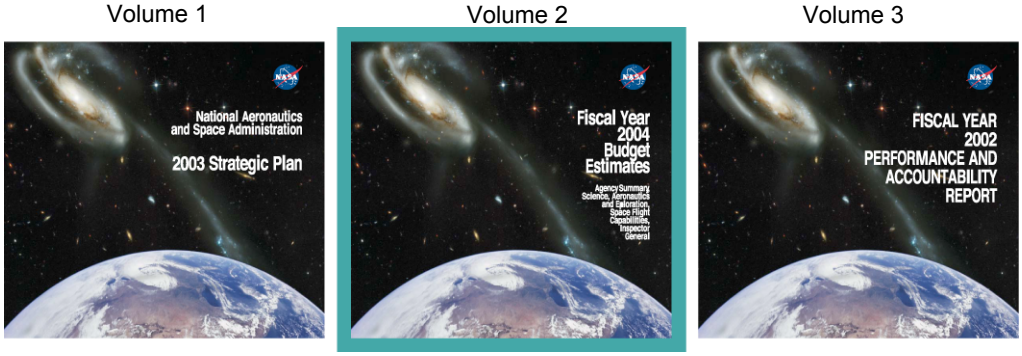


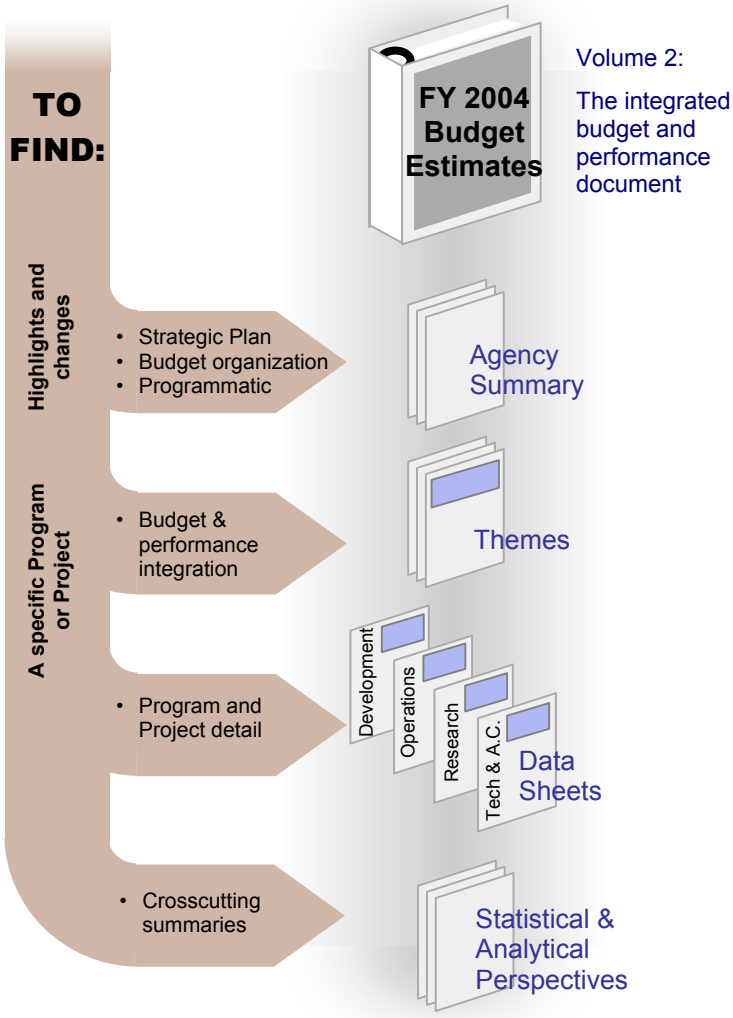
This document is part of the three-volume NASA Fiscal Year 2004 Congressional Budget Submission.

This integrated budget and performance document represents a new approach to presenting the National Aeronautics and Space Administration (NASA) budget request, and a major step forward in budget and performance integration. It looks different from NASA's budget requests of the past, and we have made many changes that improve the clarity and consistency of the text. It is one of three volumes – along with the *2003 Strategic Plan* and the *Fiscal Year 2002 Performance and Accountability Report*.

The Agency Summary that follows provides highlights of:

- Strategic Plan changes,
- Programmatic changes, and
- Budget organization changes.

The table to the right may aid you in navigating through this integrated budget and performance document.



HIGHLIGHTS OF THE NEW STRATEGY

Strategy Highlights	Summary
The New Vision and Mission	NASA's Vision and Mission reflect our hopes and challenges for the future.
Transforming NASA	To be successful, NASA must transform itself while guided by a set of core values.
Agency Goals	Agency Goals outline what NASA will achieve in coming decades and provide the context for planning and program development.
Implementing Strategies	NASA will base all activities on a foundation of sound planning and management practices.
As Only NASA Can	NASA will pursue activities unique to our mission in aeronautics and space.
Strategic Structure and Performance Planning	NASA's planning process starts with our long term Vision and Mission, and flows to more focused near term plans and documents.

Each highlight is briefly discussed below and then discussed in depth in the NASA 2003 Strategic Plan.

New Vision and Mission

NASA's new Vision and Mission focus the Agency's programs on the pursuit of answers to compelling questions. Using our unique knowledge and expertise, we build the tools that enable revolutionary robotic and human missions. Through scientific research and strategic investments in transformational technologies, we open new pathways toward missions that were impossible only a few years ago.

NASA's Vision and Mission reflect our hopes and challenges for the future.

Through them, we emphasize our unique roles and focus the Agency on the things it does best. As the Nation's leading organization for research and development in aeronautics and space, we are explorers and pioneers who use our unique tools, capabilities, and perspective for the benefit of the Nation and the world.

Our ability to fully achieve our Mission is constrained by the need for new technologies that can overcome our current limitations. We must

provide ample power for our spacecraft as well as reliable and affordable transportation into space and throughout the solar system. We must deploy innovative sensors to probe Earth, other planets, and other solar systems. We must be able to communicate large volumes of data across vast distances, so that we can get the most from our robotic explorers. And we must learn to mitigate the physiological and psychological limitations of

humans to withstand the harsh environment of space.

To address these challenges, we are making strategic investments in our FY04 budget request in transformational technologies. Some of these investments include Project Prometheus for breakthrough propulsion techniques that will enable spacecraft to travel faster and farther and will allow them to carry larger scientific payloads and make new types of measurements, and new power systems that will transform the way we conduct research in space. Also, revolutionary optical communications technologies, using laser light instead of radio waves, will dramatically increase our ability to transmit information across the solar system. Research into the human factors of space travel through the human research initiative will enable us to understand the effects of the space environment on how we live and work in space and will ensure that future explorers can carry out their missions safely and effectively.

Transforming NASA

NASA's strategy for the future represents a new paradigm, in which strategic building blocks progressively create steppingstones to exploration and discovery. To be successful, NASA must transform itself while being guided by a set of core values.

NASA's Core Values

Safety.
NASA's Mission success starts with safety. A commitment to safety permeates everything we do. We are committed to protecting the safety and health of the general public, pilots and astronauts, the NASA workforce, and our high-value assets on and off the ground.

People.
Our greatest strength is our workforce, a team of highly qualified individuals that is representative, at all levels, of America's diversity. We foster a culture of trust, respect, teamwork, communication, creativity, equal opportunity, and empowerment.

Excellence.
We are committed to excellence. We continuously improve our processes, products, and services to better serve our customers.

Integrity.
We are honest and ethical in all that we do. We deliver on our commitments, and we are accountable for our performance.

These values are not only central to responsible public service, they are also essential to the achievement of our Vision and Mission. With these values as our solid foundation, we will pursue these five significant transformations.

1) All investments will contribute to a single set of Agency goals and will be directly traceable to our Vision and Mission.

The NASA of today is unified around a common purpose, expressed by our Vision and Mission. A single set of NASA-wide goals defines how we will achieve our Mission. These goals are not unique to any one organization within NASA; they span the entire Agency to provide a context for planning programs and monitoring performance. Every NASA program and project must be relevant to one or more of the goals, and thus to the Vision and Mission. Specific performance measures will be identified for each program to assess how well that program contributes to the goals. Underperforming programs will be redirected or canceled.

2) Human space flight capabilities will be expanded to enable research and discovery.

In the early days of NASA, the demonstration of human space flight was a national priority, motivated by the need to prove American technological preeminence. This demonstration led to some of the most spectacular achievements in human history, and during the past 20 years, NASA has systematically developed the capability to live and work in space. With a successful Space Shuttle program and an International Space Station that is nearing completion, we now have the tools that enable the utilization of the unique environment of space for research and development. Human space flight will always be an integral and critical element of our strategy for space exploration. NASA will continue to expand its human presence in space—not as an end in itself, but as a means to further the goals of exploration, research, and discovery.

3) Technology developments will be crosscutting.

With the new focus on a unified NASA Vision, Mission, and goals, we must carefully select our

technology investments to provide the greatest benefit across the Agency and to the public. We will emphasize technologies with broad applications, such as propulsion, power, computation, communications, and information technologies. These and other crosscutting technologies represent opportunities to leverage our limited resources to advance the overall NASA Mission. Project-specific technologies will continue to be identified and funded with resources from the project to which they apply.

4) Education and inspiration will be an integral part of all our programs.

Over the years, NASA's exploration and innovation have inspired and motivated countless individuals from all walks of life. The information age has made our task easier in some ways, but more difficult in others. Today, there is so much competition for the minds and imaginations of young people that it can be difficult to engage them in the science and engineering that will lead them to technical careers. NASA's education and public outreach programs must be modern, successful, exciting, and relevant to students, teachers, and parents. In the past, education and outreach were not always built into NASA programs at their inception, and their effectiveness varied as a result. Today, educational and motivational activities are being incorporated into every NASA program from the earliest stages. A new NASA Enterprise has been created to serve as the Agency's focal point for education planning and implementation, and the performance of our education programs will be tracked like that of any other NASA activity. The result will be a much more effective use of the vast educational potential of NASA's ongoing exploration and research. Over time, this may help to turn the tide of declining interest and performance in science and mathematics among America's youth and may motivate more of them to pursue careers as scientists, engineers, and explorers.

5) We will operate as One NASA in pursuit of our Vision and Mission.

NASA is a large Agency, consisting of thousands of public servant and contractor employees, Field Centers across the United States, and facilities in foreign countries. With our new focus on a unified long-range Vision and Mission, it is imperative that all elements of the Agency work together as a single team. By developing common procedures, capabilities, tools, and organizations, we will ensure that the overall functioning of the Agency is as smooth and efficient as possible. We will also present a single electronic presence to the Nation, so that all NASA products and information are readily available without confusion or delay. By unifying the Agency, we will reinforce the shared commitment of all NASA employees to our common goals.

Agency Goals

Our Vision and Mission represent NASA's fundamental contributions to the Nation and the world, and they provide us with a clear, unified, and long-term direction for all of our activities. To achieve the new Vision and Mission, we have established Agency goals that outline what NASA will achieve in the coming decades. They also will provide the context for planning and program development. Seven strategic goals are established to carry out NASA's Mission. In addition, three enabling goals are established in areas critical to the achievement of those strategic goals. The goals listed below are described in detail in the strategic plan.

Goal 1: Understand Earth's system and apply Earth-system science to improve the prediction of climate, weather, and natural hazards.

Goal 2: Enable a safer, more secure, efficient, and environmentally friendly air transportation system.

Goal 3: Create a more secure world and improve the quality of life by investing in technologies and collaborating with other agencies, industry, and academia.

Goal 4: Explore the fundamental principles of physics, chemistry, and biology through research in the unique natural laboratory of space.

Goal 5: Explore the solar system and the universe beyond, understand the origin and evolution of life, and search for evidence of life elsewhere.

Goal 6: Inspire and motivate students to pursue careers in science, technology, engineering, and mathematics.

Goal 7: Engage the public in shaping and sharing the experience of exploration and discovery.

Goal 8: Ensure the provision of space access and improve it by increasing safety, reliability, and affordability.

Goal 9: Extend the duration and boundaries of human space flight to create new opportunities for exploration and discovery.

Goal 10: Enable revolutionary capabilities through new technology.

The goals will be achieved by NASA's Enterprises and supporting organizations through a series of objectives. The programs and tasks that implement the objectives are funded through 18 themes, which represent the Agency structure for budget planning, management, and performance reporting. Every activity that is funded within a theme must contribute to the achievement of one or more goals through its associated objectives. These contributions are documented by the long-term and annual performance measures which constitute NASA's Performance Plan that is integrated throughout this document and summarized in the Special Issues section. This structure ensures that NASA is directly accountable for its performance, and that the results of every NASA program are visible to the taxpayers and traceable to the Agency's Vision and Mission.

The matrix shown on the following pages lists the goals and shows their relationships to the budget themes and Enterprises that implement them. It also provides a roadmap for the objectives, and supporting contributions that are described in detail in the relevant Theme write-up.

Implementing Strategies

To fulfill our challenging Mission and realize the full potential of the benefits we can provide to the Nation, we will base all NASA activities on a foundation of sound planning and management practices. These Implementing Strategies are not necessarily unique to NASA; they are similar in intent to management strategies of all well-run organizations. But, they are critical to NASA's achievement of its strategic and enabling goals.

All of NASA is committed to these Implementing Strategies. Through them, we will ensure that we maintain the excellence and innovation that the Nation expects, along with an unwavering commitment to safety and fiscal responsibility.

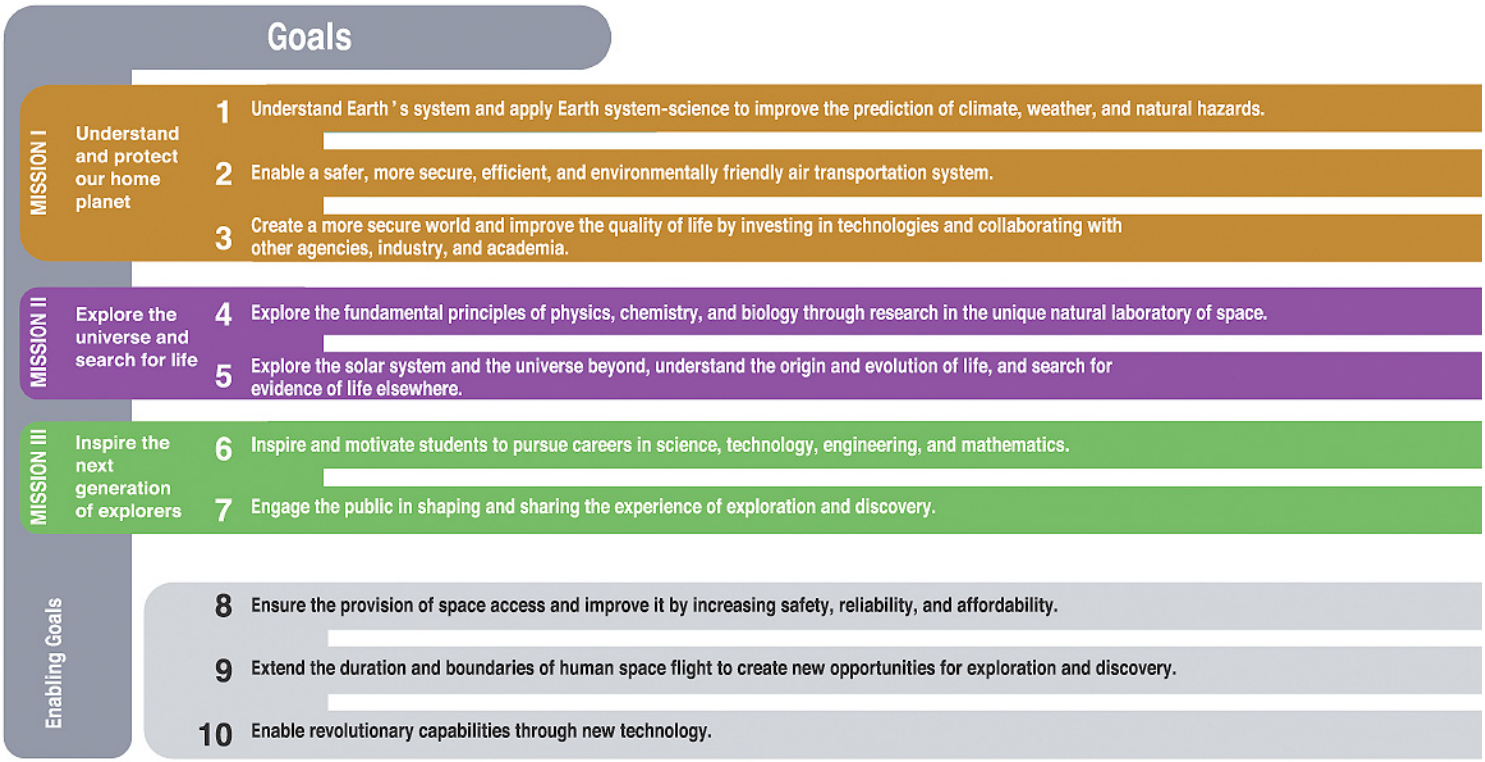
The Implementing Strategies below are described in more detail in the Strategic Plan. Objectives for each are included in the Performance Plan Summary in the Special Issues section.

- Achieve management and institutional excellence comparable to NASA's technical excellence;
- demonstrate NASA leadership in the use of information technologies;
- enhance NASA's core engineering, management, and scientific capabilities and processes to ensure safety and mission success, increase performance, and reduce cost;
- ensure that all NASA work environments, on Earth and in space, are safe, healthy, environmentally sound, and secure; and
- manage risk and cost to ensure success and provide the greatest value to the American public.

As Only NASA Can

We will pursue activities unique to our Mission in air and space. If NASA does not do them, they will not get done. If others are doing them, we should question why NASA is involved. NASA is the Nation's leading organization for research and development in aeronautics and space. We have developed expertise, tools, and facilities that collectively represent a unique national asset. It is our mandate to undertake challenging projects of national importance that fit our unique capabilities. We must apply those capabilities to conquer persistent limitations to exploration. By focusing on these requirements, we are able to apply extensive, but finite, capabilities to the challenges that truly demand this expertise. Our successes often spawn new projects that can then be accomplished by private industry, universities, or other Government agencies, and NASA-developed tools and techniques will be transferred to these organizations to help them succeed. In this way, we continuously enhance the collective capability of the Nation, and we ensure that the explorers and innovators of NASA are ready to take on the next challenge. By continuing to pioneer and discover, we will expand our horizons and inspire the Nation's youth
. . . *as only NASA can.*

All elements of NASA work together to achieve Agency goals. The goals are listed below, and the Themes are listed by Enterprise at right. Elements of the matrix indicate each Theme's primary (■) and supporting (○) contributions. These contributions are the objectives and annual performance goals addressed in the Theme discussions in this document.



Science, Aeronautics, and Exploration
Space Flight Capabilities
Enterprises
Themes
Space Science
Earth Science
Biological and Physical Research
Aerospace Technology
Education
Space Flight
Aerospace Technology
Solar System Exploration (SSE)
Mars Exploration (MEP)
Astronomical Search for Origins (ASO)
Structure and Evolution of the Universe (SEU)
Sun-Earth Connection (SEC)
Earth System Science (ESS)
Earth Science Applications (ESA)
Biological Sciences Research (BSR)
Physical Sciences Research (PSR)
Research Partnerships and Flight Support (RPFS)
Aeronautics Technology (AT)
Education Programs (EP)
International Space Station (ISS)
Space Shuttle Program (SSP)
Space and Flight Support (SFS)
Space Launch Initiative (SLI)
Mission and Science Measurement Technology (MSM)
Innovative Technology Transfer Partnerships (ITTP)

Strategic Structure and Performance Planning

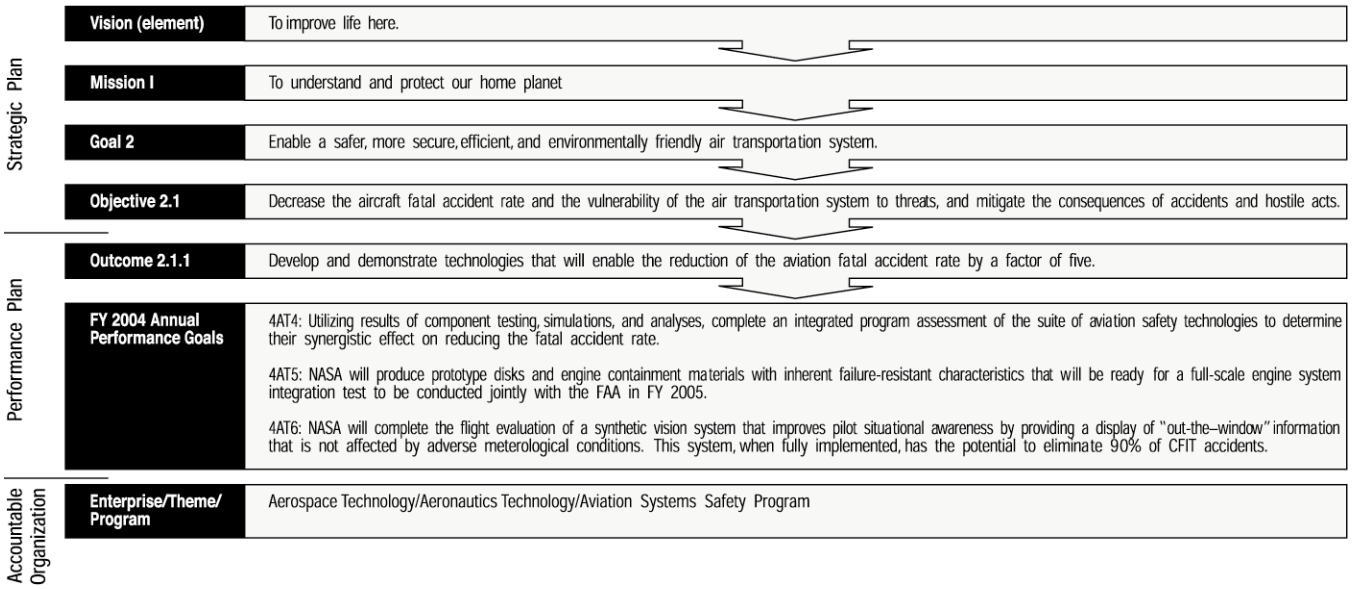
NASA's planning process starts with long-term Vision and Mission and flows to more focused near-term plans and documents.

The NASA Vision, Mission, goals, and objectives are documented in the strategic plan. The proposed outcomes and FY 2004 annual performance goals are distributed throughout this Integrated Budget and Performance Document. NASA will improve the quality of these measures, and our objectives as necessary, making them more quantifiable and verifiable, and will release an updated FY 2004 performance plan prior to September 15, 2003. NASA also plans to release an updated FY 2003 performance plan that is consistent with this new strategic plan and the new strategic framework for budget and performance integration.

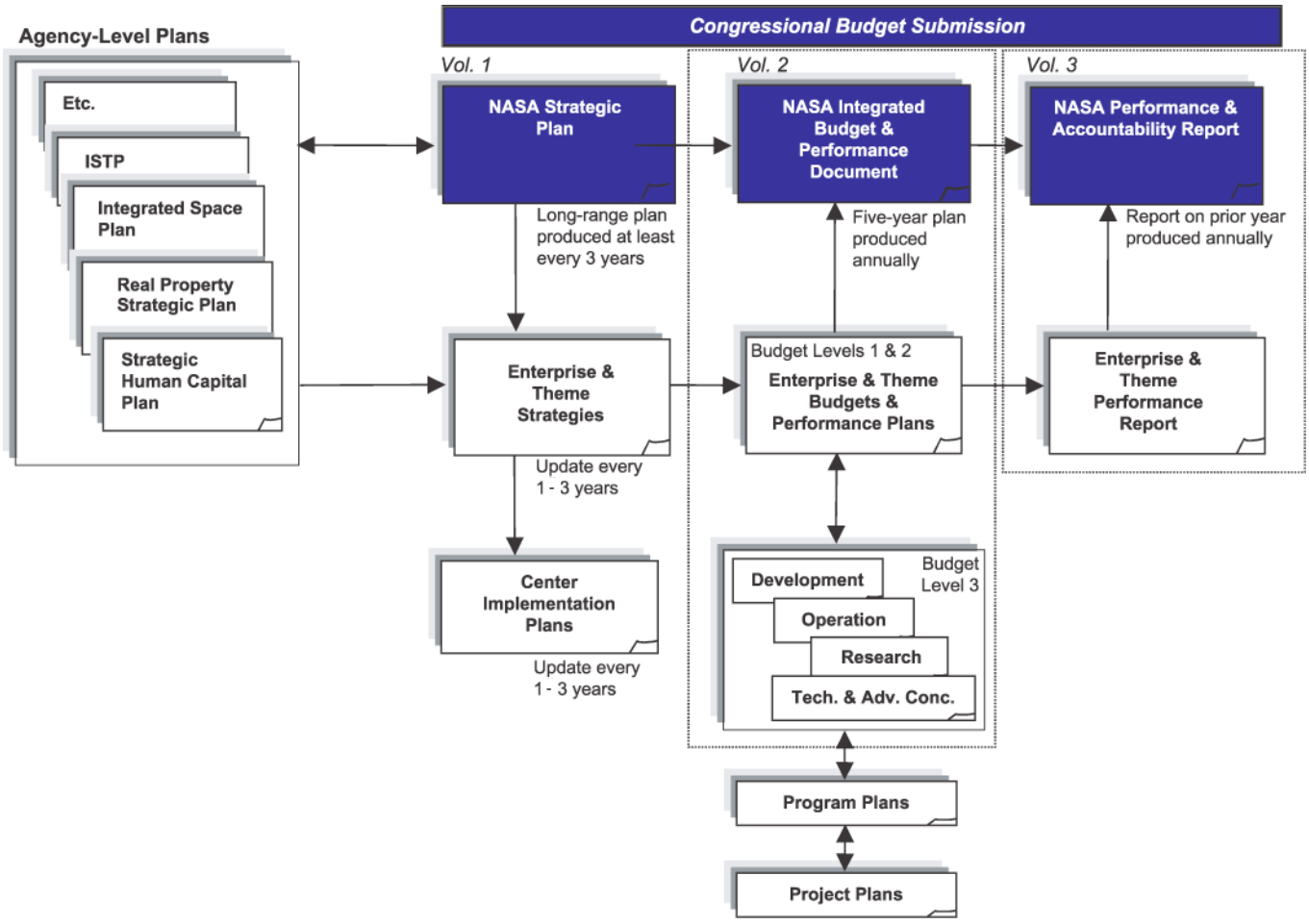
In order to make performance planning an integral part of how the Agency is managed, NASA will incorporate the performance planning process into our annual budget formulation or program operating plan (POP) development process. The POP for preparing the FY 2005 budget request will be the first formal development cycle tasked with defining the outcomes and annual performance goals for each theme.

NASA will also be revising Enterprise and theme implementation plans to provide more detail as to how the goals and objectives in this plan will be achieved. NASA Centers will also be revising their implementation plans to illustrate how they will support the Enterprises and themes in meeting NASA's Mission and Vision.

The following figures show the strategic structure. The first figure demonstrates the flow from the Agency Vision and Mission down through the performance plan in this document. The second figure shows the relationship between this document and the other documents in the Congressional Budget submission. The other documents are the *2003 Strategic Plan* and the *FY 2002 Performance and Accountability Report*.



This example demonstrates the flow from the top level of the strategic plan through the detailed performance measures.



This diagram provides a summary of and linkage between NASA's key strategic, budget, and performance documents.

HIGHLIGHTS OF PROGRAMMATIC CHANGES

New Initiatives in President's FY 2004 Budget Request			
($ in millions)	2004	2004-08 Total	Pages
To Understand and Protect Our Home Planet:			
Climate Change Research Acceleration	26	72	SAE 8-2
Aviation Security	21	196	SAE 15-11
National Airspace System Transition Augmentation	27	100	SAE 15-15
Quiet Aircraft Technology Acceleration	15	100	SAE 15-19
To Explore the Universe and Search for Life:			
Project Prometheus	93	2,070	SAE 2-19
Optical Communications	31	233	SAE 2-19
Beyond Einstein Initiative	59	765	SAE 5-2, 19
Human Research Initiative	39	347	SAE 11-15,19 SAE 12-13, 15
To Inspire the Next Generation of Explorers:			
Education Initiative	26	130	SAE 17-7, 9
Total for Initiatives	337	4,013	

NASA's FY 2004 request is $15.469 billion, a $469 million or 3.1 percent increase over the FY 2003 President's Budget. NASA's request includes $337 million ($4.0 billion over five-years) for new initiatives.

Initiatives represent strategic investments in breakthrough nuclear propulsion and power systems to be demonstrated on an ambitious mission to Jupiter's moons; revolutionary communications technologies using laser light instead of radio waves to dramatically increase our ability to transmit information across the solar system; constellations of networked spacecraft that will probe the edge of black holes and the mystery of dark energy that is expanding the universe; research into the human factors of space travel to enable safe human exploration beyond Earth; climate change research targeted at high priority policy issues; new aeronautics technologies to enable safer, quieter, and more efficient air travel; and education investments to expand the number of students pursuing science and engineering careers. These initiatives are summarized in the table above.

This budget maintains changes made in the FY 2003 Budget Amendment sent to Congress in November 2002 including additional resources to the International Space Station to successfully achieve U.S. core complete and support its newly prioritized research program; adding a fifth annual Space Shuttle launch; and supporting the Integrated Space Transportation Plan that calls for development of an Orbital Space Plane, technologies for future launch systems, and a service life extension program to keep Shuttle flying longer.

This budget is restructured to reflect Strategic Plan with two new accounts entitled *Science, Aeronautics, & Exploration* (SA&E) to reflect our science and research driven agenda, and *Space Flight Capabilities* that contain activities that enable the SA&E activities to succeed.

Program budgets have been revamped to reflect full cost, meaning institutional activities such as personnel and facilities are now included in the benefiting program's budget, hence, reflecting the true cost of the program and enabling managers to make better economic decisions.

Space Science Enterprise

The Space Science Enterprise seeks to answer fundamental questions about life in the Universe, including how it arose, its mechanisms, where in the solar system it may have originated or exist today, and whether there are similar planetary environments around other stars where the signature of life can be found. The Enterprise also seeks to understand how the universe began and evolved, how stars and galaxies formed, and how matter and energy are entwined on the grandest scale. The Space Science Enterprise is comprised of five themes described below.

Solar System Exploration

This theme seeks to understand how our own solar system formed and evolved, and about possible life beyond Earth. The planets of our solar system and the ancient icy bodies far from the Sun are Rosetta stones that can tell unique stories about the evolution of our solar system. As we learn more about the origins of living systems on Earth and our solar system's planets and moons, we may learn that life has also arisen on some of them. Highlights for FY 2004 include:

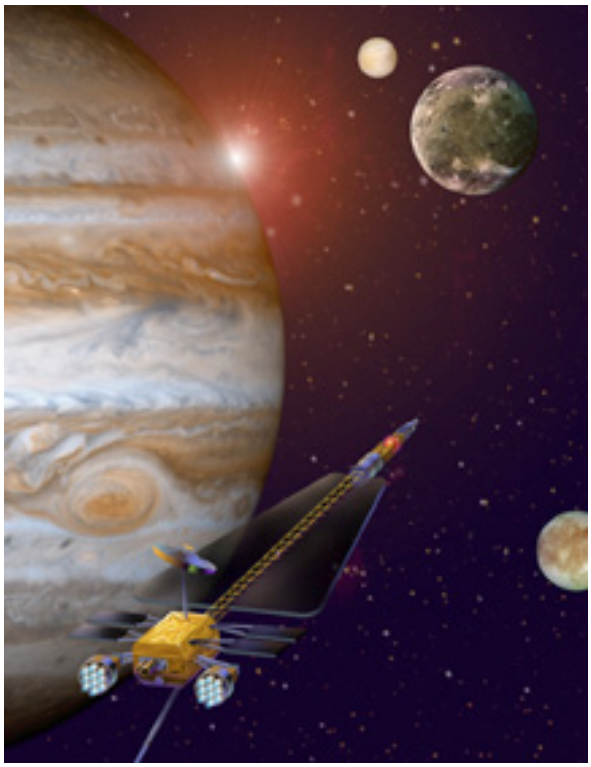
Overall budget

FY 2004 request is $1,359 million, a $312 million or 30 percent increase over FY 2003 President's Request (full cost):

- $177 million for three missions in development; MESSENGER mission to explore Mercury, DAWN mission to orbit around two asteroids, and Deep Impact mission to probe below the surface of a comet.

- $130 million for New Frontiers program to explore the outer planets in the solar system, including funding for the New Horizons mission to Pluto and the Kuiper Belt.

- $68 million for Astrobiology research to improve the ability to find and identify life on other planets.



NASA's new Project Prometheus will transform our abilities to explore the outer planets as illustrated by this image of the Jovian mission.

New Initiative – Project Prometheus

Request includes $279 million for this new initiative ($3 billion over five years). This consists of $186 million ($1 billion over five-years) from the Nuclear Systems Initiative introduced in FY 2003 and adds $93 million ($2 billion over five-years) for a first flight mission, Jupiter Icy Moon Orbiter, to be flown within a decade.

- Nuclear technology will enable unprecedented science data return through high power science instruments and advanced communications technology.

- Jupiter Icy Moon Orbiter will search for evidence of global subsurface oceans on Jupiter's three icy Galilean moons: Europa, Ganymede, and Callisto. These oceans may harbor organic material.

- Mission will set the stage for the next phase of exploring Jupiter and will open the rest of the outer solar system to detailed exploration.

New Initiative – Optical Communications
Request includes $31 million for this new initiative ($233 million over five years):

- Offers potential for many orders of magnitude improvement in communication data rate. Example: using conventional radio frequency communications, the Mars Reconnaissance Orbiter will take 21 months to map 20 percent of the surface of Mars; if used optical communications then would allow the *entire* surface to be mapped in 4 months.

- Critical technology exists, but must be demonstrated. Plan first demonstration at Mars in 2009 using telecom satellite around Mars that relays data to high-altitude Earth balloons. The balloon receiver technology will be demonstrated by the middle of this decade.

- Promises dramatic reduction in cost per byte of data returned and could, ultimately, replace the Deep Space Network.

Major Events in 2004
- Deep Impact will launch in January 2004, to fire a projectile at comet Temple-1 to investigate the composition of the comet's interior.

- MESSENGER will launch in March 2004, to conduct a detailed investigation of Mercury, the least explored terrestrial planet.

- Stardust will encounter comet Wild-2 in January 2004 and collect dust samples that will be returned to Earth in 2006.

- Cassini arrives at Saturn in July 2004 following a seven-year journey.

- Genesis returns to Earth in September 2004 with its samples of the solar wind following its two-year "sunbath".

Mars Exploration

This theme explores the mysteries of the history and present conditions on Mars. Dry and cold today, the Martian surface shows the traces of a wet and warmer past. Frozen water at its poles and hints of relatively recent liquid water flows make Mars the most likely place to seek evidence of ancient or present extraterrestrial life. Contrasts between the current and past geology, atmospheres, and magnetic fields of Mars and Earth promise insights into why these neighboring planets differ so much today. Advances in our understanding of Mars would be useful for future human exploration. Highlights for FY 2004 include:

Overall budget
FY 2004 request is $570 million, a $20 million or 3.6 percent increase over FY 2003 President's Request (full cost):

- $184 million for development of 2005 Mars Reconnaissance Orbiter, an orbiter that will map Martian surface features as small as a basketball (20-30 cm).

- $29 million for 2007 Scout Mission, a unique opportunity for scientists and industry to compete and provide innovative ideas for Mars exploration.

- $118 million for 2009 Mars Smart Rover/Lander, a rover that will traverse tens of kilometers over Mars and last over a year, digging and drilling for unique samples to study in its onboard laboratory.

- $9 million ($336 million over five-years) added for a new mission, a telecommunications satellite around Mars in 2009, to enhance science data return and demonstrate the first interplanetary optical communications link.

Major Events in 2004
- Mars Exploration Rovers arrive at Mars in January 2004 and will begin science operations. The Rovers are designed to last for 90 days of surface operations and should travel about 600 meters during that time.

- Mars Reconnaissance Orbiter will begin integration and test in preparation for launch in 2005.

Astronomical Search for Origins

This theme strives to answer two questions: Where did we come from? Are we alone? The theme seeks to observe the birth of the earliest galaxies and the formation of stars, find planetary systems in our region of the galaxy, including those capable of harboring life, and learn whether life exists beyond our solar system. We need to understand the building blocks of life, the conditions necessary for life to persist, and the signatures it writes on the sky. By exploring the diversity of other worlds and searching for those that may harbor life, we hope to understand the origins of our own world. Highlights for FY 2004 include:

Overall budget
FY 2004 request is $877 million, a $78 million or 10 percent increase over FY 2003 President's Request (full cost):

- $239 million for Hubble Space Telescope operations as well as funding for a Shuttle servicing mission in 2005 and a Shuttle retrieval mission in 2010 as the Hubble ends its operations.

- $255 million for development of James Webb Space Telescope planned for launch about 2010 and promising to build on the legacy of Hubble Space Telescope.

- $80 million for development of Space Interferometry Mission planned for launch in 2009 to detect planets around other stars.

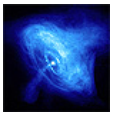
Major Events in 2004

- Final preparations for Hubble Space Telescope Servicing Mission-4, which will launch in early 2005. Two new instruments will be installed on this mission: Wide Field Camera-3 and the Cosmic Origins Spectrograph.

- Final preparation for SOFIA airborne observatory first flight in April 2005.

- Initial science operations of Space Infrared Telescope Facility (SIRTF), the final mission of NASA's Great Observatory Program.

Structure and Evolution of the Universe



This theme seeks to understand the nature and phenomena of the Universe. It seeks to understand the fundamental laws of space, time, and energy and to trace the cycles that have created the conditions for our own existence. This is accomplished in part by observing signals from the Big Bang, mapping the extreme distortions of space-time about black holes, investigating galaxies, and understanding the most energetic events in the universe. We also must try to understand the mysterious dark energy that pervades the universe and determines its ultimate destiny. Highlights for FY 2004 include:

Overall budget
FY 2004 request is $432 million, a $33 million or 8.3 percent increase over FY 2003 President's Request (full cost):

- $116 million for development of Gamma-ray Large Area Space Telescope (GLAST), a mission to study high-energy objects like black holes.

New Initiative – Beyond Einstein
Request includes $59 million for this new initiative ($765 million over five years):

- Offers potential to answer three questions left unanswered by Albert Einstein's theories: What powered the Big Bang? What happens to space, time, and matter at the edge of a black hole? What is the mysterious dark energy expanding the universe?

- Laser Interferometer Space Antenna (LISA) will use three spacecraft "formation flying" 5 million kilometers apart in a triangle to

observe the distortion of space due to gravity waves.

- Constellation-X will use a team of powerful X-ray telescopes working in unison to observe black holes, investigate "recycled" stellar material, and search for the "missing matter" in the universe; it will be 100 times more powerful than any single X-ray telescope that has come before it.

- Einstein Probes, a program that will begin later this decade, consists of fully and openly competed missions (in the manner of the Discovery, Explorers, and New Frontiers programs) to conduct investigations that benefit Structure and Evolution of the Universe science objectives.

Major Events in 2004

- SWIFT gamma-ray burst explorer begins science operations following launch in late 2003.

- GLAST will conduct its Critical Design Review.

Sun-Earth Connections

This theme investigates our Sun and how its structure and behavior affect Earth. The Sun's energy is responsible for the Earth's present ecosystem, but the Sun is a variable star. Its small variability profoundly affects the Earth. Changes in its long-term brightness cause ice ages, and its 11-year cycle of activity causes aurorae and other disturbances on the Earth. Solar flares affect the upper atmosphere and can damage satellites and disable the power distribution grid on the ground. The Sun is also our nearest star and is an ideal laboratory for basic physics and learning about other stars. Highlights for FY 2004 include:

Overall budget

FY 2004 request is $770 million, a $95 million or 14 percent increase over FY 2003 President's Request (full cost):

- $166 million for development of STEREO and Solar Dynamics Observatory.

- $212 million for future flight missions.

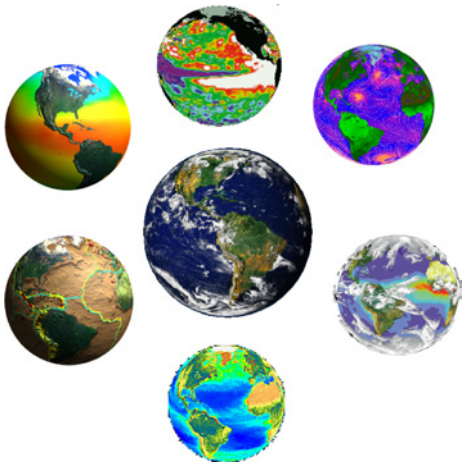
Major Events in 2004

- STEREO completes integration and test in preparation for launch in 2005. STEREO will use two identically equipped spacecraft to provide revolutionary 3-D imaging of coronal mass ejections.

- Solar Dynamics Observatory enters implementation of development in January 2004. It is a cornerstone mission in the Living With a Star program. It will study the Sun's magnet field and the dynamic processes that influence space weather.

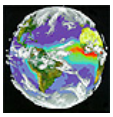
Earth Science Enterprise

NASA's Vision to improve life here starts with the Earth Science Enterprise's study of planet Earth from space. The Enterprise seeks to understand and protect our home planet by advancing Earth system science and applying the results to improve prediction of climate, weather, and natural hazards. The Enterprise is comprised of two themes described below.



NASA uses remote sensing satellites to view different environmental processes on the Earth, from severe weather to changes in ozone levels to volcanic eruptions.

Earth System Science



Within this theme, we are deploying and operating the first comprehensive constellation of Earth-observing research satellites designed to reveal interactions among Earth's continents, atmosphere, oceans, ice, and life. These interactions produce the conditions that sustain life on Earth. Data and information from our satellites enable researchers to understand the causes and consequences of global change and inform the decisions made by governments, businesses, and citizens to improve our quality of life. Highlights for FY 2004 include:

Overall budget

FY 2004 request is $1,477 million, a $52 million or 3.4 percent decrease from FY 2003 President's Request (full cost):

- The decrease in the budget from FY 2003 to FY 2004 is driven primarily by major development programs that are past their peak development spending and are preparing for launches in 2004 including AURA, Cloudsat, and Calipso.

- $96 million for the NPOESS Preparatory Project (NPP) under development in partnership with National Oceanic and Atmospheric Administration and the Department of Defense (DOD). NPP transfers critical research instruments to operational agencies and maintains data continuity for NASA sponsored scientific investigations.

- $60 million for the Landsat data continuity mission, which is an innovative program to seek partnerships with industry to continue receiving critical land remote sensing data.

- $524 million for research and modeling that help answer critical scientific questions on climate change to aid policy and economic decision-makers.

New Initiative – Climate Change Research Initiative Acceleration

Request includes $26 million for this new initiative ($72 million over five years):

- Accelerates evaluation of non-carbon dioxide (CO_2) impact on climate change. These factors potentially have as much or more influence as CO_2, which is the focus of most studies, and can be reduced with far less economic impact and with added benefits to public health and agriculture.

- To greatly enhance our ability to evaluate non-CO_2 forcings, an advanced polarimeter instrument will be flown to measure methane,

troposheric ozone, aerosols and black carbon. Troposheric ozone, black carbon (soot) and aerosols are also important public health factors.

- Advanced polarimeter will be launched in the 2007 timeframe, which is about four years earlier than originally planned.

Major Events in 2004

- Launches of Aura, Cloudsat and Calipso satellites in 2004. The Aura mission will study Earth's ozone, air quality, and climate. Cloudsat will measure the structure of clouds from space to better quantify their key role in the Earth's water cycle and climate system. Calipso, coupled with Aura and the advanced polarimeter, will help determine the role of aerosols in climate, reducing one of the largest uncertainties in climate models.

- Use satellite observations to provide daily and seasonal global atmospheric water vapor, rainfall, snowfall, sea-ice, and ice-sheet maps and use these observations to improve the scientific understanding and models of water cycle thorough the Earth system.

- Use satellite-derived localized temperature and moisture profiles, with unprecedented accuracy and global coverage, to improve predictive capabilities of regional weather models.

- Assimilate satellite and in situ observations into a variety of ocean, atmosphere, and ice models for purposes of estimating the state of Earth's seasonal and decadal climate.

- Demonstrate the benefits of formation flying multiple satellites in a constellation for the first time (i.e. creating a super-satellite) to enable generation of integrated science information products, e.g., aerosol distribution, optical thickness and properties to assess their total effect on climate aerosols.

Earth Science Applications

Within this theme, NASA works with other federal agencies to apply our research results and Earth observation information products to applications of national priority. We have identified applications where our partner agencies have decision support systems, such as weather prediction models and near-airport terrain databases, that are being improved based on NASA research and technological innovations. For each application, joint applications research and demonstrations are under way or being developed. In addition, the theme develops crosscutting solutions that advance the use of NASA information and technology across a range of potential new applications. Highlights for FY 2004 include:

Overall budget

FY 2004 request is $75 million, a $6.5 million or 8.0 percent decrease from FY 2003 President's Request (full cost):

- Theme completely revamped to focus on 12 specific applications of national priority where other agencies' decision support systems can be markedly improved based on NASA-provided data and information. Competitive, merit-review will be the hallmark of extramural project selection.

Major Events in 2004

- Benchmark improvement to at least two national applications: air quality and agricultural productivity.

- Competitively select projects for the Research, Education, Applications Solutions Network (REASoN) program to serve national priorities.

Biological and Physical Research Enterprise

NASA's Biological and Physical Research Enterprise conducts interdisciplinary fundamental and applied research to address opportunities and challenges of human exploration of space. Access to space provides new opportunities to explore profound questions about the laws of nature. At the same time, we are entering space as an unique environment that poses serious medical and environmental challenges. The Enterprise exploits the rich opportunities of space flight in pursuit of answers to a broad set of scientific questions, including those about the human health risks of space flight. The space environment offers a unique laboratory in which to study biological and physical processes. Access to space allows scientists to conduct research under conditions that are unique in the history of science. Experiments that take advantage of this environment extend from basic biology to quantum mechanics and from fundamental research to research with near-term applications in medicine and industry. The Biological and Physical Research Enterprise is comprised of three themes.

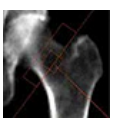
New Initiative – Human Research Initiative

Request includes $39 million for this new initiative ($347 million over five years). Of the total, $25 million is directed towards Biological Science Research ($283 million over five years) and $14 million towards Physical Sciences Research ($64 million over five years). Goals include:

- Certify crew safety for missions beyond low Earth orbit over 100 days by mitigating the highest risks.

- Enable knowledge and technology to reduce mass to orbit and beyond for life support by a factor of three by 2010.

Biological Sciences Research



Within this theme, we determine ways to support a safe human presence in space. Space flight exposes humans to physiological and psychological health risks from radiation, reduced gravity, and isolation. We are researching how to define and control these risks. This theme also conducts research and development to improve the performance of life support systems. It includes a basic biology research component that seeks both to pursue fundamental biological research questions from cell to tissues to whole organisms which produce results that can support advanced methods for enabling human exploration of space. Highlights for FY 2004 include:

Overall budget

FY 2004 request is $359 million, a $55 million or 18 percent increase over FY 2003 President's Request (full cost):

- $210 million for Bioastronautics Research. In response to ReMAP prioritization, expands planned ground research program in countermeasures development by $27 million, which includes an increase of approximately $20 million in funding for the National Space Biomedical Research Institute from $10 million to $30 million and a $7 million increase through the new Human Research Initiative. The initiative also starts a flight program in high priority areas of advanced human support technology by adding $18 million.

- $149 million for Fundamental Space Biology. In response to ReMAP prioritization, adds $20 million for habitat holding rack development, cell culture unit and ground based research, and animal and plant habitats for research on the Space Station Centrifuge.

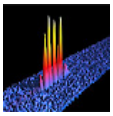
- Adds $12 million to ensure adequate levels of reserves for Space Station hardware development and research operations.

Major Events in 2004

- 25 biological sciences flight experiments scheduled to be conducted on the Space Shuttle and Space Station.

- Habitat Holding Rack flight hardware available by September 2004.

Physical Sciences Research



This theme supports research that takes advantage of the unique environment of space to expand our understanding of the fundamental laws of nature. We also support applied physical science research to improve safety and performance for human exploration and research that has applications in terrestrial industry. Highlights for FY 2004 include:

Overall budget

FY 2004 request is $353 million, a $2.0 million or 0.6 percent increase over FY 2003 President's Request (full cost):

- Responds to the ReMAP prioritization external study by realigning Physical Sciences Research funds. Provides adequate funding and reserve levels for the major PSR International Space Station Research Capability Development facility class space flight hardware, while reducing funding for lower priority areas such as biomolecular technology, and structural biology future facility class space flight hardware, and level II program management support. Increases funding for research of strategic importance to NASA's long-range goals, including radiation protection and basic research in power and propulsion technologies. Rephases deployment of Low Temperature Microgravity Physics Facility consistent with the availability of the Japanese Experiment Module (JEM) Exposed Facility.

- Reallocates $11 million in FY 04 reserves to ensure adequate levels of reserves for Space Station hardware development (Fluids and Combustion Facility, Low Temperature Microgravity Physics Facility, and Materials Science Research Rack) and research operations.

- Reallocates $28 million for Space Station research equipment initial deployment of the Combustion Integration Rack (CIR) component of the Fluids and Combustion Facility ($22 million) and Materials Science Research Rack (MSRR) ($6 million).

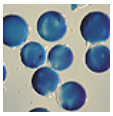
Major Events in 2004

- 6 physical sciences flight experiments scheduled to be conducted on the Space Shuttle and Space Station.

- Delivery of the first major PSR research facility rack to the International Space Station, the Combustion Integrated Rack (CIR) on ULF-2. Beginning of prime research facility operations on the ISS, a new phase of Space Station utilization.

- Fluids Integrated Rack (FIR) flight hardware available by August 2004.

Research Partnerships and Flight Support



This theme establishes policies and allocates space resources to encourage and develop research partnerships in the pursuit of NASA missions and Enterprise scientific objectives. This research supports product development on Earth and leverages industry resources to accelerate progress in our strategic research areas. Ultimately, research partnerships may support development of an infrastructure that can be applied to human exploration. Highlights for FY 2004 include:

Overall budget

FY 2004 request is $261 million, a $6.8 million or 2.7 percent increase over FY 2003 President's Request (full cost):

- $49 million for Space Product Development. Restructures program by aligning industrial partnerships with NASA mission needs and Enterprise scientific objectives. Will review the existing research partnership centers to determine those centers to be retained. The focus will remain on the flight program.

- As part of the FY 2003 Budget Amendment, provides funding for additional research/logistics missions to Space Station beginning in FY 2006. Of the total $113 million over five-years added to budget for these research missions, Space Product Development has $4 million over five years and Multi-User Systems and Support has $93 million. The remaining $16 million is distributed between Biological Sciences Research and Physical Sciences Research.

- $212 million for Multi-User Systems and Support funding.

- Space Product Development budget was augmented by two activities: (1) the transfer of the Anti-Matter Spectrometer program management and budget from Physical Sciences Research; and (2) the consolidation of the Enterprise Support program content and budget, previously diffused across various programmatic components.

Major Events in 2004

- 12 flight experiments from Space Product Development scheduled to be conducted on the Space Shuttle and Space Station.

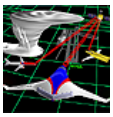
- Multi-User Systems and Support will be involved in preparation of CIR and Express Research launches to Station in July 2004 and Europe's five research racks and two attached payloads planned for launch with the Columbus Module in October 2004, the first international partner laboratory module to be deployed on the Space Station.

Aerospace Technology Enterprise

The Aerospace Technology Enterprise contributes to the NASA Vision by pioneering and developing advanced technologies. These technologies in turn improve the air transportation system, access to space, and science missions. This Enterprise helps others use NASA technology for non-aerospace commercial purposes and develops technology partnerships with industry and academia outside traditional aerospace fields. The Aerospace Technology Enterprise is comprised of four themes described below.

NASA graphical cockpit weather displays provide real time information that can help aircrews avoid areas of hazardous weather.

Aeronautics Technology



This theme plays a key role in creating a safer, more secure, environmentally friendly and efficient air transportation system, increasing performance of military aircraft, and developing new uses for science or commercial missions. This theme also enhances the Nation's security through its partnerships with the DOD and Federal Aviation Administration (FAA). Research areas include advanced propulsion technologies, lightweight high-strength adaptable structures, adaptive controls, advanced vehicle designs, and new collaborative design and development tools. In collaboration with the FAA, research is conducted in air traffic management technologies for new automation tools and concepts of operations. Highlights for FY 2004 include:

Overall budget

FY 2004 request is $959 million, a $10 million or 1.0 percent increase over FY 2003 President's Request (full cost).

- $169 million for Aviation Safety and Security projects aimed at reducing accident and fatality rates.

- $217 million for Airspace Systems projects to provide technologies that can dramatically increase the capacity and mobility of the nation's air transportation system.

- $574 million for Vehicle Systems projects focused on development of breakthrough technologies for future aircrafts and air vehicles.

New Initiative – Aviation Security

Request includes $20 million for this new initiative ($195 million over five years):

- Addresses critical aviation security needs that NASA is uniquely qualified to provide.

- Develops technology for commercial aircraft and airspace protection, including development of damage-tolerant structures and autonomous and reconfigurable flight controls technology to prevent aircraft from being used as weapons and to protect against catastrophic loss of the aircraft in the event of damage from sabotage or explosives.

New Initiative – National Airspace System Transition Augmentation

Request includes $27 million for this new initiative ($100 million over five years):

- Enables technology, in cooperation with FAA, to transition to a next-generation National Airspace System that would increase

the capacity, efficiency, and security of the system to meet the mobility and economic-growth needs of the Nation, reducing delays and increasing air transportation efficiency.

New Initiative – Quiet Aircraft Technology Acceleration

Request includes $15 million for this new initiative ($100 million over five years):

- Accelerate development and transfer of technologies that will reduce perceived noise in half by 2007 compared to the 1997 state-of-the-art.

- Fully implemented throughout the system, eliminates unacceptable noise outside the boundary of the airport.

Major Events in 2004

- Experimentally demonstrate a highly-efficient, light-weight compressor to decrease engine emissions.

- Complete validation and assessment of NASA-developed decision-support air traffic controller aids in support of the FAA's Operational Evolution Plan.

- Prototype inherently failure resistant engine components to improve aircraft safety.

Space Launch Initiative

This theme ensures safe, affordable, and reliable access to space. New space transportation capabilities are needed to ensure that America continues its leadership in space. The theme gives special emphasis to NASA's unique needs, including crew escape and survival systems. It helps create a more secure world by collaborating with the DOD on critical access to space and hypersonics technologies that support future civil and military aerospace missions. Highlights for FY 2004 include:

Overall budget

FY 2004 request is $1,065 million, a $85 million or 7.4 percent decrease from FY 2003 President's Request (full cost):

- $550 million for Orbital Space Plane program to develop a crew return capability from Space Station by 2010 and crew transfer capability atop an expendable launch vehicle by 2012. Funding supports technology demonstrators such as X-37 and advanced design studies.

- $515 million for Next Generation Launch Technology program to meet NASA's future space launch needs. Funding includes advanced kerosene engine development and hypersonic propulsion research and testing.

Major Events in 2004

- Test flight of DART vehicle to demonstrate autonomous rendezvous technology between a chase vehicle and an on-orbit satellite.

- Drop test of X-37 vehicle from carrier aircraft to demonstrate autonomous landing capability as a precursor to a planned orbital demonstration.

- Conceptual design review of Orbital Space Plane with sufficient cost, schedule, technical and risk definition to enable a full-scale development decision.

Mission and Science Measurement Technologies

This theme is responsible for developing crosscutting technology for a variety of aviation and space applications, such as communications, power and propulsion systems, micro-devices and instruments, information technology, nanotechnology, and biotechnology. These technology advances will have the potential to open a new era in aviation and allow space missions to expand our knowledge of Earth and the Universe. Our technologies are unique to NASA because we focus on space mission applications. Highlights for FY 2004 include:

Overall budget

FY 2004 request is $438 million, a $4 million or 0.9 percent increase over FY 2003 President's Request (full cost):

- $233 million for Computing, Information, and Communications Technologies program including intelligent and autonomous systems for science exploration missions.
- $44 for Engineering for Complex Systems program including develop of engineering tools to improve safety and mission success.
- $161 million for Enabling Concepts and Technologies program including development of revolutionary technologies in support of NASA's other Enterprises.

Major Events in 2004

- Demonstrate technologies for millimeter precision formation flying.
- Demonstrate spacecraft communications technologies achieving 1Gbps or greater for near Earth, and 1Mbps or greater for deep space applications.
- Demonstrate lightweight, sub-kilowatt ion engine for small spacecraft.
- Develop prototype workstation that provides capability to identify, track, and trade-off risk.

Innovative Technology Transfer Partnerships

Under this theme, we will work to develop partnerships with industry and academia to develop new technology that supports Enterprise programs; commercialize and transfer NASA technology to U.S. industry; and enhance NASA technology and commercial objectives through the Small Business Innovation Research and Small Business Technology Transfer (SBIR/STTR) programs. Highlights for FY 2004 include:

Overall budget

FY 2004 request is $169 million, a $14 million or 7.6 percent decrease from FY 2003 President's Request (full cost):

- $5 million for Enterprise Engine being introduced to create partnerships with innovators to sponsor dual use technologies to further NASA's mission and meet our future technology needs.
- $29 million for discontinuing the existing commercial technology promotion efforts and, instead, recompeting and refocusing our technology transfer programs to maximize benefits to the taxpayer.
- $135 million for SBIR/STTR programs.

Major Events in 2004

- Award SBIR and STTR grants.
- Establish partnerships with innovators under the operation of the Enterprise Engine.

Education Enterprise

Education, our newest Enterprise, was established in 2002 to inspire more students to pursue the study of science, technology, engineering and mathematics, and ultimately to choose careers in aeronautics and space-related fields. This new Enterprise will unify the educational programs in NASA's other five enterprises and at the 10 field centers under a *One NASA Education* vision. NASA Education will permeate and be embedded within all the Agency's activities. The Education Enterprise includes the Education Programs theme.

Education Programs

The Education Enterprise will provide unique teaching and learning experiences, as only NASA can, through the Agency's research and flight capabilities. Students and educators will be able to work with NASA and university scientists to use real data to study the Earth, explore Mars, and conduct other scientific investigations. They will work with our engineers to learn what it takes to develop the new technology required to reach the farthest regions of the solar system and to live and work in space. It is important that the next generation of explorers represents the full spectrum of the U.S. population, including minority students and those from low-income families. To ensure the diversity in NASA's workforce, our educational programs pay particular attention to under-represented groups. NASA Education will support our Nation's universities to educate more students in science and engineering by providing meaningful research and internship opportunities for qualified students, plus a roadmap for students to seek NASA careers. Highlights for FY 2004 include:

Overall budget

FY 2004 request is $170 million, a $10 million or 6.1 percent increase over FY 2003 President's Request (full cost):

- $78 million for education programs including the continuation of pipeline development programs for students at all educational levels and the continuation of the Space Grant/EPSCOR programs, providing a national link with the higher education community.
- $92 million for minority university research and education including funding opportunities for minority institutions to increase the number and percentage of state-certified mathematics, science, or technology teachers.
- Education Enterprise funding is coordinated with an estimated $55 million in education-related funding managed by the five other NASA Enterprises.

New Initiative – Education Initiative

Request includes $26 million for this new initiative ($130 million over five years):

- $2 million for the Educator Astronaut Program that will select teachers and transport them into space to inspire and motivate students.
- $13 million for the NASA Explorer Schools Program that will provide target middle schools with a customized and sustained learning environment using NASA's most recent discoveries and latest technologies to garner greater interest in science and engineering careers.
- $9 million for Scholarship for Service that will link scholarship with service at a NASA Center and help NASA better attract top students into our workforce.
- $2 million for Explorer Institutes, NASA's direct link with the informal education community (science centers and museums) through openly competed grants.

Major Events in 2004

- New solicitation for the university research center program that will further expand and strengthen the research capacity of minority institutions.
- Selection of the first class of educator astronauts.
- Pilot implementation of approximately 50 Explorer Schools.

Space Flight Enterprise

The Space Flight Enterprise provides many critical enabling capabilities that make possible much of the science, research and exploration achievements of the rest of the Agency. The Space Flight Enterprise does this through three themes described below:

International Space Station

This theme supports activities for establishing a permanent human presence in Earth orbit – the International Space Station. The Space Station provides a long-duration habitable laboratory for science and research activities to investigate the limits of human performance, expand human experience in living and working in space, and enable commercial development of space. The Space Station will allow unique, long-duration, space-based research in cell and developmental biology, plant biology, human physiology, fluid physics, combustion science, materials science, and fundamental physics. It will also provide a unique platform for observing the Earth's surface and atmosphere, the Sun, and other astronomical objects. Highlights for FY 2004 include:

Overall budget

FY 2004 request is $1,707 million, a $144 million or 7.8 percent decrease from FY 2003 President's Request (full cost):

- Funding drops as planned as development activities near an end and on-orbit operations and research becomes the focus of the program.

- Maintains proposal in FY 2003 Budget Amendment including additional funds for reserves plus funding Node 3 and Environmental Closed Life Support System (ECLSS) in FY 2004.

- Continues significant progress toward resolving the Space Station management and cost control issues that confronted the program at the end of 2001. Many changes based on recommendations of the ISS Management and Cost Evaluation (IMCE) task force have increased NASA's confidence in achieving success with the U.S. Core Complete station.

- A new management team is in place with the authority to control program content, to ensure station capabilities are driven by science requirements, and to make the appropriate decisions as the program moves from development into its operational phase.

- The development of NASA's integrated financial management core system and a management information system are progressing on schedule.

- The Space Station program is well on its way to completing work on the U.S. Core Complete configuration. Flight elements undergoing ground integration and test are proceeding on schedule, and the last U.S. flight element is scheduled for delivery to NASA by the spring of 2003.

Major Events in 2004

- Achieve U.S. core complete by spring 2004.

- 12 U.S. racks available for research.

- Expect awards for new contract opportunities for Space Station support.

Space Shuttle

This theme builds on the Shuttle's primacy as the world's most reliable and versatile launch system. The shuttle, first launched in 1981, provides the only capability in the United States for human access to space. In addition to transporting people, materials, and equipment, the Space Shuttle allows astronauts to service and repair

satellites and build the Space Station. The Space Shuttle can be configured to carry different types of equipment, spacecraft, and scientific experiments that help scientists understand and protect our home planet, explore the Universe, and inspire the imagination of the American people. Highlights for FY 2004 include:

Overall budget

FY 2004 request is $3,968 million, a $183 million or 4.8 percent increase over FY 2003 President's Request (full cost):

- Supports steady state flight rate of five per year.
- Provides $379 million ($1.7 billion over five-years) for Space Shuttle Service Life Extension, a program to improve safety and infrastructure needs to allow flying Space Shuttle into the next decade.
- Exploring all alternatives for competitive sourcing of Shuttle flight operations following the conclusion of the current Space Flight Operations Contract in order to best fly safely, meet flight schedule, and improve the existing Shuttle system.

Major Events in 2004

- Five flights focused on Space Station assembly.
- Space Shuttle Main Engine Health Management System ready for first flight.

Space and Flight Support

This theme encompasses space communication, launch services, rocket propulsion testing, and advanced systems. Space communications consists of the tracking and data relay satellite system (TDRSS), which supports space shuttle, expendable launch vehicles, and research aircraft, and the NASA integrated services network, which provides telecommunications services at facilities such as flight support networks, mission control centers and science facilities, and administrative communications networks for NASA centers. The Launch Services program focuses on meeting the Agency's launch and payload processing requirements by assuring safe and cost effective access to space via the Space Shuttle and expendable launch vehicles. Rocket propulsion testing supports a core of highly trained test and engineering crews and test facilities. Advanced Systems program includes studies of human and robotic exploration of space. Highlights for FY 2004 include:

Overall budget

FY 2004 request is $434 million, a $36 million or 7.7 percent decrease from FY 2003 President's Request (full cost):

- $125 million for Space Communications budget. Continues support for formulation phase of TDRS Continuation project.
- $142 million for oversight of expendable launch vehicle flights and supporting payload carriers for Shuttle launches.
- $62 million for rocket propulsion testing.
- $85 million for environmental compliance including $44 million for Plum Brook cleanup.

Major Events in 2004

- Commence Plum Brook reactor building demolition and disposal.
- Award of the Space Mission Communication and Data Service Procurement, the follow-on to the Consolidated Space Operations Contract (CSOC).

Institutional Investments

As a function of full cost management, the following institutional investments are included in the preceding Enterprise budgets as either direct program charges or as Center or Corporate General & Administrative (G&A) charges. These areas are included in the summary below to provide visibility into the resources provided for these activities.

Center G&A

Center G&A costs include Center security, ground maintenance, fire protection, business computing, public affairs, institutional construction of facilities (CoF), human resources, procurement, budgeting, etc.. FY 2004 highlights include:

($ in millions)	FY 2004
Ames Research Center	129
Glenn Research Center	100
Dryden Flight Research Center	41
Goddard Space Flight Center	171
Johnson Space Center	159
Kennedy Space Center	169
Langley Research Center	143
Marshall Space Flight Center	146
Stennis Space Center	39
Total, Center G&A	*1097*

- $1.097 billion total for FY 2004 allocated as shown in the graphic above.
- Includes $24 million additional funding for enhanced security.

Corporate G&A

Corporate G&A costs include headquarters operations and agency-wide functions. FY 2004 highlights include:

- $613 million total for FY 2004 as shown in the table below.
- Includes $126 million for the Integrated Financial Management Program (IFMP), which plans to complete implementation of the core module by summer 2003, and additional modules by 2006.

($ in millions)	FY 2004
Headquarters Corporate Activities	293
Corporate IFMP	126
Agency Operations	68
Safety and Mission Assurance	35
Chief Engineer	33
Chief Information Officer	22
Center-based Corporate (e.g., payroll)	12
Construction of Facilities	11
Security Management	8
Chief Health and Medical Officer	4
Total, Corporate G&A	*613*

Workforce

FY 2004 highlights include:

- $2.107 billion for salaries and benefits in support of 18,693 full-time equivalent (FTE) civil service compared to 18,471 FTEs in FY 2002 and estimated 18,837 FTEs in FY 2003.

Construction of Facilities

FY 2004 highlights include:

- $248 million for Construction of Facilities (CoF), a $26 million or 11 percent increase over FY 2003 President's Budget.
- Includes $64 million for program direct CoF, carried in program budgets.
- Includes $173 million for institutional CoF, carried within Center G&A.
- Includes $10 million for a Facility Demolition initiative, carried within Corporate G&A, to remove unused buildings at the NASA field centers.

Environmental Compliance

FY 2004 highlights include:

- $85 million for environmental compliance including $44 million for Plum Brook cleanup.

HIGHLIGHTS OF BUDGET ORGANIZATION CHANGES

Highlighted Change	Summary
Proposed appropriations	This budget request includes the Science, Aeronautics and Exploration (SAE) and the Space Flight Capabilities (SFC) appropriations.
Full cost budgeting	This budget request is presented with its full cost.
Performance budgeting	The performance plan is included with the budget so that the proposed investment may be directly compared to the proposed return.
New budget format	A new format that uses standardized templates lays out the costs, benefits, and risks of each element in a consistent, easy to understand way.

Each significant change is briefly discussed below and then discussed in depth in the *Statistical and Analytical Perspectives*.

Proposed Appropriations

NASA's budget request includes the Science, Aeronautics and Exploration (SAE) and the Space Flight Capabilities (SFC) appropriations. The SAE appropriation provides for the full costs associated with NASA's Space Science, Earth Science, Biological and Physical Research, Aeronautics, and Education programs. The SFC appropriation provides funding for the full costs associated with NASA's Space Flight and Crosscutting Technology programs. Full costs include both the direct and the indirect costs supporting the programs, and provides for all of the research; development; operations; salaries and related expenses; design, repair, rehabilitation, and modification of facilities and construction of new facilities; maintenance and operation of facilities; and other general and administrative activities supporting the programs.

NASA's third appropriation, the Inspector General, provides funding for the Office of Inspector General to conduct audits and investigations of agency activities. The Inspector General keeps the Administrator informed of problems and deficiencies in agency programs and operations.

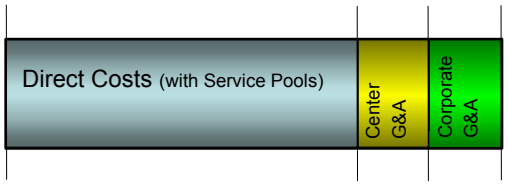
For the proposed appropriation language, please refer to the FY 2004 Budget Data discussion in the *Statistical and Analytical Perspectives*.

Full Cost Budgeting

The FY 2004 NASA Budget provides, for the first time, NASA's programs and projects in a full cost budget format. "Full cost" means that all Agency direct and indirect costs are identified and included in a given NASA program/project budget. All civil service salaries and other NASA infrastructure costs are included. With full cost budgeting, there is a direct link between each program or project and the infrastructure used by it. Where full cost figures appear on budget tables in this document, they are highlighted in yellow.

With full cost budgeting, each program/ project's budget consists of three new cost categories: Direct (with service pools); Center General and Administrative (G&A); and Corporate G&A. The full cost for a program/project is the sum of these three costs.

Definition of Full Cost Components



The service pool costs included in each budget represents the planned program consumption of service pools that have been established at each center to provide a broad range of support capabilities to programs. The G&A costs represent basic infrastructure at the centers (grounds, security, business functions, etc.) and at the Agency level (Headquarters Operations, Agency-wide functions, etc.) that are allocated to each program/project budget.

On October 1, 2003, NASA is to fully implement the Agency's Full Cost Initiative, of which full cost budgeting is the initial major step. For the first time, NASA will operate in a total full cost environment for: managing its projects from a full-cost perspective; accounting for all NASA costs as direct or as G&A; and budgeting for all appropriate costs. NASA began this important initiative in 1995 in direct response to the need for improved Agency cost information to enhance Agency performance.

A major benefit of full cost budgeting is that it provides the Agency and its managers with better information to support decision-making, and helps the Agency optimize the use of its resources (dollars, workforce, and facilities). Full cost information provides a more complete, "full" disclosure of NASA's activities, clearer linkage between resource inputs and outputs/outcomes, and greater accountability of NASA's use of taxpayer resources.

Applying full cost practices will enable a more efficient use of institutional resources. Program managers will have more insight and a greater role in defining their infrastructure requirements.

For a detailed discussion of the full cost budget, please refer to the Full Cost discussion in the *Statistical and Analytical Perspectives.*

Performance Budgeting

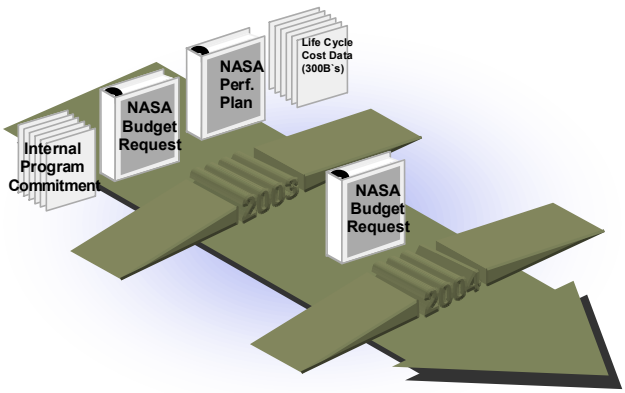
The FY 2004 NASA Budget Request is a performance-based budget. This represents a significant change from past years' budgets and addresses challenges posed by NASA's stakeholders.

"What has been missing:

- Past and planned results are not shown with budget requests, let alone lined in a cost-and-results relationship.
- Program managers responsible for achieving results often do not control the resources they use or have the flexibility to use them effectively.
- Performance and cost data are recorded in separate systems and not integrated to provide timely, analytical, feedback to decision makers and managers.
- Americans cannot readily assess program results, and cannot compare performance and cost across programs."

-- *FY03 President's Budget (Government-Wide Analytical Perspectives pp. 3)*

Many of the documents that in past years were separate, have now been combined into one. Most importantly, this brings together the NASA Budget Request and the NASA Performance Plan. Beyond these two major documents, the data sheets in this new document replace many separately published and maintained data sheets. These include presentations of the life-cycle cost of development programs and projects.



The FY 2004 Budget Request integrates the information that was provided in past years in separate documents.

First, there will be fewer, more informative pages. The same information was provided in multiple documents before. For instance, program descriptions appeared in the Budget Request, the Performance Plan, special life-cycle cost exhibits, and internal commitment agreements. Now, this information is presented once and the chance of a discrepancy between documents is eliminated. There is also a uniformity of information across programs. As part of the integration, a single set of Agency-wide templates was developed. Each Enterprise, Theme, Program, and Project had to provide comparable information in the appropriate template.

Beyond providing consistent and comparable information, the templates are concise. Details about acquisition strategy and technical commitments are presented in one place. In previous years there was a great deal of information that was redundant or excessive, and that has been eliminated. In other areas it might be useful to have access to additional detail. A comprehensive approach was used where hyperlinks are presented so that an interested reader can easily access this detail.

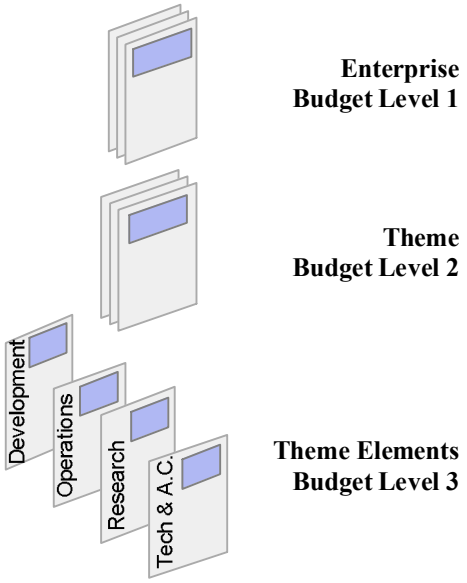
The second major benefit of the integrated budget and performance document is that the same structure is used across all Agency documentation, including the 2003 Strategic Plan, the Budget and Integrated Performance Plan, and the Performance Report. The performance of strategic investments can be directly measured because the investment will be explicitly tracked under one name. Every program or project can be traced from the Agency Vision and Mission, by way of the Strategic Plan.

New Budget Format

This year, the budget has a new look. The new format was devised as a part of the budget and performance integration effort. It provides an easy way to navigate the budget system to reference all the elements of the NASA FY 2004 Budget. It also presents the costs and benefits of each element in a consistent, easy to understand way.

The new look of the budget comes from the use of standardized templates. A different template is used to present each budget level. The templates ensure that the same information is provided for each element of the budget. It is this standardization that makes it easy to navigate through the document to find the information you need and also makes it easy to compare information between two parts of the budget.

For further details on each section and how to interpret the data, please refer to the Special Issues discussion in the *Statistical and Analytical Perspectives*.



The budget is structured in levels. At the first level are the 6 Enterprises. At the second level are the 18 Themes. The third level is split into four categories. Each of these levels is described on a set of uniform sheets. The fourth level provides additional detail and is discussed on the Level 3 sheets.