

Executive Summary

In March 1995, President Clinton ordered a sweeping reexamination of the United States Government's approach to putting science and technology to the service of national security and global stability in light of the changed security environment, increasing global economic competition, and growing budgetary pressures. This *National Security Science and Technology Strategy*, the product of that reexamination, is the country's first comprehensive Presidential statement of national security science and technology priorities. It augments the President's *National Security Strategy of Engagement and Enlargement* by articulating science and technology policies and initiatives that support the President's three primary national security objectives: enhancing our military readiness and capabilities, preventing conflict from occurring through engagement with other nations, and promoting prosperity at home. It advances that document's central approach of preventing conflict and maintaining the capability to respond should conflict occur. It is built on the recognition that our security depends on economic strength as well as military power. And it is grounded in the conviction that investment in science and technology is central to our ability to meet the challenges ahead. This National Security Science and Technology Strategy defines our new approaches to applying science and technology to the challenges that most directly affect our nation's security.

New Realities

The *National Security Science and Technology Strategy* recognizes that, with the end of the Cold War, our nation faces more diverse and complex challenges. The central security concern of the past half century—the threat of communist expansion—is gone, but civil conflict is spreading and rogue states pose a danger to regional stability. The rapid diffusion of information, people, capital, and technology raises the risk of proliferation of advanced weapons, including weapons of mass destruction. And demographic pressures contribute to large-scale environmental and resource degradation, which saps economic strength and can undermine political order. Meeting these modern-day threats to stability and security requires an enduring commitment to diplomatic engagement, military readiness, and economic performance. In each instance, science and technology cooperation and investments play a central role. For five decades, scientific discovery and technological innovation have advanced our military capabilities and economic prosperity, ensuring the United States' position as a world leader. Now, as the demands of international leadership are growing, so too are the demands on our financial resources. This document describes how investments and international cooperation in science and technology can contribute to our national security goals in a fiscally responsible manner.

Maintaining Military Strength

In the military arena, the challenge is to ready our forces to address a more varied set of threats while at the same time downsizing and restructuring our forces to respond to the defense needs of the 21st century. To achieve these objectives, the Administration has launched a series of initiatives designed to develop and apply the most advanced technologies, maintain critical defense-related industrial capabilities, and accomplish these goals in the most affordable manner.

The Administration is committed to a sustained investment in the technology base needed to ensure that our nation maintains the best-trained and best-equipped forces in the world. Our investment strategy involves long-term research as well as near-term applications as it is only in hindsight that we are able to

discern the revolutionary military capabilities provided by breakthroughs such as radar, digital computers, semiconductor electronics, lasers, fiber optics, and navigation systems capable of great accuracy

New technologies have dramatically enhanced our ability to both prepare for and execute military actions. By supporting advances in information technologies, sensors, and simulation, we strengthen our ability to plan and conduct military operations, quickly design and produce military systems, and train our forces in more realistic settings. These technologies are also central to greater battlefield awareness, enabling our forces to acquire large amounts of information, analyze it quickly, and communicate it to multiple users simultaneously for coordinated and precise action. As Defense Secretary William J. Perry has noted, these are the technological breakthroughs that are "changing the face of war and how we prepare for war."

Steady investment in science and technology also underlies our ability to succeed in high-priority missions, to minimize casualties, to mobilize all of our military services swiftly in coordinated action, and to act in concert with other nations to achieve shared security objectives. New technologies are being developed to strengthen our efforts in peacekeeping, counterproliferation, counterterrorism, and the stewardship of a safe and reliable nuclear weapons stockpile. Technological advances are also being pursued to fortify the joint fighting capabilities of our services. And advanced technologies support multilateral efforts to enhance mutual defense capabilities through standardization and interoperability with the forces of friendly and allied countries.

To increase the performance and reduce the costs of new defense technologies, the Administration has launched initiatives that reflect new ways of doing business. *Acquisition reform* removes barriers that separate the defense industry from the commercial industry and thus ensures that the military acquires the highest quality equipment at the lowest cost. Our *dual-use technology policy* recognizes that our nation can no longer afford to maintain two distinct industrial bases and allows our armed forces to exploit the rapid rate of innovation of commercial industry to meet defense needs. The Technology Reinvestment Project supports that policy by leveraging commercial technology advances to create military advantage. In addition, to continue the development of advanced, operationally-relevant technologies without making expensive commitments to product procurement, the Administration has developed the *Advanced Concept Technology Demonstration* initiative.

Controlling Arms and Stemming the Proliferation of Weapons of Mass Destruction

Stemming the proliferation of weapons of mass destruction is a priority that requires both science and technology investments and cooperation. The United States is expanding its cooperation with the states of the former Soviet Union to dismantle the massive arsenals left from the Cold War at an accelerated pace, to ensure that weapons and weapons materials are secure and accounted for, to assure the scientifically sound disposition of these materials, and to employ former weapons scientists in needed civilian research.

The Administration is pursuing a broad range of efforts to reduce existing military threats and stem the spread of weapons of mass destruction and their missile delivery systems, including new agreements, improved safeguards, and new technologies for monitoring and verification. We have secured agreements with Ukraine, Belarus, and Kazakhstan to send all the nuclear weapons on their soil to Russia. We have also achieved an indefinite extension of the *Nuclear Nonproliferation Treaty*, and we are working toward a *Comprehensive Test Ban Treaty* and *Ban on Fissile Materials*, for the ratification of the *Chemical Weapons Convention*, and the strengthening of the *Convention on Biological Weapons*.

Science and technology are fundamental to arms control treaty verification and nonproliferation. The Administration's strategy for investing in science and technology to support our nonproliferation and arms control policies focuses on three critical elements: strengthening the technical know-how to build effective arms restraint, continually improving detection, monitoring, and verification capabilities, and promoting science and technology cooperation to advance arms reduction and nonproliferation goals.

Meeting the Challenge of Global Threats

The Administration recognizes that there is a broad class of global threats that endangers the security and well being of Americans and others around the world. The United States is not isolated from the effects of disease, disasters, or human suffering abroad. In the modern world, diseases readily cross borders, chronic hunger can set off a cycle of instability and migration that can lead to war, and environmental degradation can have global consequences that threaten the populations of all nations. Our strategy for addressing these challenges rests on three pillars: preventive diplomacy, promoting sustainable economic development, and responding to global threats. In all aspects of this strategy, science and technology play a central role. By investing in research and monitoring, this Administration is seeking to mitigate stresses that can lead to conflict, strengthening efforts in population stabilization, food security, resource stewardship, natural disaster mitigation, infectious disease control, and the promotion of scientific knowledge.

Scientific research and monitoring underlie our ability to respond to threats such as climate change and biodiversity loss. Global surveillance and basic biomedical research are key to addressing emerging and reemerging infectious disease. The Administration is putting into place a national response to this threat and is working to improve international monitoring efforts. Science and technology can also assist population stabilization through education, planning, reproductive health care, and better methods of contraception, food security through increased agricultural productivity and improved food preservation, storage, and distribution, resource stewardship through research that strengthens the sustainable management of temperate and tropical forests, coastal and marine resources, natural disaster mitigation through developing and implementing technologies for both monitoring and mitigation, and the promotion of scientific knowledge about sustainable development through electronic networks.

To strengthen policies in these areas, the Administration has pursued a strategy of comprehensive science and technology cooperation with countries in transition with the goal of promoting scientific discovery and technological innovation. While in each instance the fundamental objective is the advancement of knowledge, these "country strategies" are designed to strengthen the science and technology communities in these countries so that they might contribute to political and economic reform, economic growth, regional stability, and sustainable development.

Strengthening Economic Security

Our nation's security and global stability depend fundamentally on the strength of our economy and a vibrant, open, international economic system. Our ability to exercise international leadership, maintain military readiness, and build a safer and more secure world depends on the vitality of our economy. Our economic engagement with other nations strengthens regional stability and acts to mitigate sources of conflict.

To advance our economic security at home, this Administration places priority on creating a climate that fosters private-sector innovation: supporting industry-led partnerships for advanced technology development, facilitating the rapid deployment of civilian technologies, building a 21st century

infrastructure, maintaining strong support for basic science, supporting education in science and technology, leveraging dual-use technologies for commercial markets, and promoting international economic development and trade through international collaboration

These investments strengthen innovation and the economy by sharing risks, enhancing communication, investing in the creation of new knowledge, improving the infrastructure for societal development, and promoting links to other nations so that we move forward with the best information and with access to global markets, strengthening economic stability globally as we enhance security at home

Economic security also lies in the creation and expansion of free markets and the integration of other nations into a larger, more open economic order. We pursue these objectives by promoting U.S. trade with and investment in not only established trading partners but also economies in transition. Our engagement with these rapidly changing economies encourages their adoption of the norms of free trade—thereby reducing international tensions, provides the United States with access to capabilities found abroad that strengthen our economy, and promotes economic growth and political stability in regions throughout the world. The Administration's "country strategies" for comprehensive science and technology cooperation are designed to advance these goals.

Other Contributions

Finally, underlying this *National Security Science and Technology Strategy* is a recognition that the Federal Government is but one player in advancing the security of our nation. Industry, academia, nongovernment organizations, and individuals also play important roles. For example, throughout the Cold War, Western scientists and scholars worked with their Soviet counterparts to advance scientific discovery and to build a basis for cooperation in arms reduction and nonproliferation. By sustaining and expanding these professional ties in the post-Soviet era, they can strengthen the Russian scientific community, which is a force for political reform and whose participation in the Russian economy is essential to economic reform. Now private-sector investments in economies in transition can fuel economic growth that is the basis for political stability. Universities, nongovernmental organizations, labor, and industry can all play a major role in promoting the security of our nation.

In Summary

The security of this nation depends on our unwavering commitment to international engagement and science and technology investments designed to address the complex challenges that we face. This *National Security Science and Technology Strategy* describes the Administration's approach to cooperation and investment in science and technology to keep our nation strong, prosperous, and secure.

