

**Excerpts of Road Map for National Security:
Imperative for Change***

**The Phase III Report of the U.S. Commission on
National Security/21st Century**

**Presented as part of the statement for the record for testimony before a Joint
Session of the Senate Subcommittee on Oversight of Government
Management, Restructuring and the District of Columbia and the House
Subcommittee on Civil Service and Agency Organization**

March 29, 2001

* Taken from the 1 March 2001 draft of the Commission's report.

II. Recapitalizing America's Strengths in Science and Education

The scale and nature of the ongoing revolution in science and technology, and what this implies for the quality of human capital in the 21st century, pose critical national security challenges for the United States. Second only to a weapon of mass destruction detonating in an American city, we can think of nothing more dangerous than a failure to manage properly science, technology, and education for the common good over the next quarter century.

Current institutional arrangements among government, higher education, and business have served the nation well over the past five decades, but the world is changing. Today, private proprietary expenditure on technology development far outdistances public spending. The internationalization of both scientific research and its commercial development is having a significant effect on the capacity of the U.S. government to harness science in the service of national security and to attract qualified scientific and technical personnel. These changes are transforming most facets of the American economy, from health care to banking to retail business, as well as the defense industrial base.

The harsh fact is that *the U.S. need for the highest quality human capital in science, mathematics, and engineering is not being met*. One reason for this is clear: American students know that professional careers in basic science and mathematics require considerable preparation and effort, while salaries are often more lucrative in areas requiring less demanding training. Non-U.S. nationals, however, do find these professions attractive and, thanks to science, math, and technical preparation superior to that of many Americans, they increasingly fill American university graduate studies seats and job slots in these areas. Another reason for the growing deficit in high-quality human capital is that the American kindergarten through 12th grade (K-12) education system is not performing as well as it should. As a result too few American students are *qualified* to take these slots, *even were they so inclined*.

This is an ironic predicament, since America's strength has always been tied to the spirit and entrepreneurial energies of its people. America remains today the model of creativity and experimentation, and its success has inspired other nations to recognize the true sources of power and wealth in science, technology, and higher education. America's international reputation, and therefore a significant aspect of its global influence, depends on its reputation for excellence in these areas. U.S. performance is not keeping up with its reputation. Other countries are striving hard, and with discipline they will outstrip us.

This is not a matter merely of national pride or international image. It is an issue of fundamental importance to national security. In a knowledge-based future, only an America that remains at the cutting edge of science and technology will sustain its current world leadership. In such a future, only a well-trained and educated population can thrive economically, and from national prosperity provide the foundation for national cohesion. Complacency with our current achievement of national wealth and international power will put all of this at risk.

A. INVESTING IN INNOVATION

Many nations in the world have the intellectual assets to compete with those of the United States. However, as many leaders abroad recognize, their social, political, and economic systems often prevent them from capitalizing on these intellectual assets. The creative release of individual energies for the public good is not possible without a political, social, and economic system that frees talent and nurtures innovation.¹

We have before us the negative example of the former Soviet Union. Its state scientific establishment was the largest in the world and very talented, yet the attitudes and institutions required to nurture and disseminate innovation in a broad sense were missing, and it never fulfilled its potential. Today, many national leaders around the world are determined not to repeat the Soviet failure. They are studying the American business and innovation environment in hopes of extracting its secrets. Lessons are being learned and adopted throughout the world. As a result, global competition is growing significantly and will continue to do so.

Meanwhile, however, many critical changes are occurring within the United States:

- While basic research remains primarily a government-funded activity, private and proprietary technology development in the United States is increasing relatively and absolutely compared to that of the government.
- The internationalization of basic science and technology (S&T) activities, assets, and capabilities is accelerating, and current U.S. advantages in many critical fields are shrinking and may be eclipsed in the years ahead.
- New classes of defense-relevant technologies are developing in which the major U.S. defense companies and national labs have scant experience. There are far fewer institutional linkages between government scientists and those innovative businesses generating and adapting cutting-edge technologies (e.g., genetic engineering, materials science, nanotechnology, and robotics).

During the 1980s, America recognized the need to change business models that had roots in the Industrial Age. It embarked on a path of deregulation and experimentation that has led to the networked economy that is still taking shape today. While U.S. reform at the microeconomic level has been primarily a private sector achievement, government has played an important role. It is also clear the government and the private sector will have to continue to work in concert to fill many critical needs: e.g., telecommunication and cyber-infrastructure policies; information assurance and protection; and policies to preserve the defense industrial base. This nation must increase its public research and development budget in order to remain a world leader. But opportunity and resources will not come together by themselves. Wise public policies are needed to enhance creative investment and promote intense experimentation.

¹ This is why it is not possible to establish a direct correlation between educational achievement and either productivity or economic growth indices. For the last two decades, for example, U.S. educational achievements have lagged behind those of many other countries even as U.S. productivity and growth measures have outdistanced them.

In particular, *we need to fund more basic research and technology development*. As is clear to all, private sector R&D investments in the United States have increased vastly in recent years. That is good, but private R&D tends to be more *development-oriented* than *research-oriented*. It is from investment in basic science, however, that the most valuable long-run dividends are realized. The government has a critical role to play in this regard, as the “spinoff” achievements of the space program over the years illustrate. That role remains not least because our basic and applied research efforts in areas of critical national interest will not be pursued by a civil sector that emphasizes short- to mid-term return on investment.

If the United States does not invest significantly more in public research and development, it will be eclipsed by others. Recent failures in this regard may return to haunt us. The decision not to invest in a large nuclear accelerator, the Superconducting Super Collider, already means that the most significant breakthroughs in theoretical physics at least over the next decade will occur in Europe and not in the United States. The reduction of U.S. research and development in basic electronics engineering has ensured that the next generation of chip processors and manufacturing technology will come from an international consortium (U.S.-German-Dutch) rather than from the United States alone.

We must not let such examples proliferate in the future, nor should we squander the enormous opportunities before us. We stand on the cusp of major discoveries in several interlocking fields, and we stand to benefit, as well, from major strides in scientific instrumentation. As a result, the way is clear to design large-scale scientific and technological experiments in key fields—not unlike the effort of the International Geophysical Year in 1958, the early space program, or the project to decode the human genome. In the judgment of this Commission, the U.S. government has not taken a broad, systematic approach to investing in science and technology R&D, and thus will not be able to sustain projects of such scale and boldness. We therefore recommend the following:

● 8: The President should propose, and the Congress should support, doubling the U.S. government’s investment in science and technology research and development by 2010.

Building up an adequate level of effort for major, long-term research for the public good will require an increased investment on the order of 100 percent over the next decade. In other words, a government-wide R&D budget of about \$160 billion by fiscal year 2010 would be prudent and appropriate.

It would not be prudent or appropriate, however, to combine the government’s science and technology capabilities into a single agency, as some have suggested doing, or to entirely centralize the government’s research and development budget. But we do need to infuse within the U.S. national R&D program a sense of responsible stewardship and vision. The government has to better coordinate its own public research and development efforts among the more than two dozen government departments and agencies that play major roles in the field.²

The coordinating body for that purpose, the White House Office of Science and Technology Policy (OSTP), which houses within it the National Science and Technology Council (NSTC). The White

² The President’s FY2001 budget allocates U.S. government research monies to its major players as follows: 43 percent NIH, 12 percent NASA, 12 percent DoE, 11 percent DoD, 8 percent NSF, 4 percent USDA, 10 percent all others. See AAAS Report XXV, *Research and Development FY2001* (Washington, DC: American Association for the Advancement of Science, 2000), p. 35. These are research budget figures only, not total R&D accounts.

House OSTP has three main functions: to help design the public R&D budget in conjunction with the Office of Management and Budget (OMB); to facilitate interagency efforts involving science and technology and research and development; and to win support for the administration's science and technology initiatives in Congress.

The National Science and Technology Council, which includes virtually every cabinet official and Executive Branch agency head, has a committee structure designed to facilitate interagency cooperation. Committees are headed by OSTP personnel, but the participants from other departments and agencies have other, usually more pressing duties. Hence, with the exception of their chairmen, NSTC committees are populated by part-timers.

The President may also use the President's Council of Advisors on Science and Technology (PCAST), composed of non-governmental experts, to help him decide science and technology policy. Its use, as with the use of the NSTC, is largely dependent on the interests and inclinations of the President. The relationships among the OSTP, the NSTC, and the PCAST vary from administration to administration.

While these coordinating and advisory bodies do exist, they are inadequately staffed, funded, and utilized to carry out their significant functions. The current OSTP is not small by White House standards, but it will increasingly be unable to keep up with its mandate as science and technology issues become more important to the national welfare. The NSTC permanent administrative staff is too small to support its committee work, and it has no permanent science and technology professional staff at all. The NSTC itself meets relatively rarely and only episodically takes on specific subjects of interest; e.g., more fuel-efficient automobiles or nanotechnology research.³

One main reason to improve these organizations, in this Commission's view, is to enable the Executive Branch to strengthen its grip on the R&D process. Three changes are required:

- The R&D budget has to be rationalized, and in order to do that a much better effort at physical and human/intellectual inventory stewardship is required.
- Those organizations responsible for rationalizing and managing the R&D process should more systematically review and redesign, as necessary, the science and technology personnel profile of Executive Branch agencies.
- The R&D budget has to be allocated through a more creative and competitive process than is the case today.

We take these issues in turn.

The ability of the White House Office for Science and Technology Policy, together with OMB and other relevant agencies, to rationalize R&D investment presupposes the ability to identify the best, generative opportunities for the investment of government R&D monies. Unfortunately, this is not the case.

³ There is, in addition, a Federally-Funded Research and Development Center mandated by Congress—the Critical Technologies Institute located within RAND—that acts as a think-tank for the OSTP. It plays a useful role and should be preserved, but it cannot substitute for a more capable OSTP itself.

Rationalizing the way that public R&D money is spent must include better accounting of both human and physical capital. It is not possible to spend \$80 billion wisely each year, let alone twice that much, unless we know where research bottlenecks and opportunities exist. There is no one place in the U.S. government where such inventory stewardship is performed. Rather, elements are dispersed in the National Science Foundation, in the Commerce Department (the Patent and Trademark Office, the National Technical Information Service, and the National Institute of Standards and Technology), in the Departments of Defense, Energy, Agriculture, Health and Human Services, and in parts of the intelligence community. We believe that collating and analyzing this information *in one place*, and using the conclusions of that analysis to inform the R&D budget process, is the *sine qua non* of a more effective public R&D effort.

Moreover, without such a basic inventory of the nation's science and technology "property," the United States could lose critical knowledge-based assets to competitors and adversaries without ever knowing it, and without understanding the implications of their loss. In an age when private, proprietary technology development outpaces publicly-funded R&D, high-end science and technology espionage is a growth industry in which both foreign corporations and governments participate. The United States therefore needs to take seriously the protection of such assets to the extent possible and practical—but it cannot protect what it cannot even identify.⁴

To achieve effective inventory stewardship for science and technology, *we recommend that OSTP, in conjunction with the National Science Foundation—and with the counsel of the National Academies of Science⁵—design a system for the ongoing basic inventory stewardship of the nation's capital knowledge assets.* The job of inventory stewardship could be vouchsafed to the National Science Board, the governing body of the National Science Foundation, were it to be provided staff for this purpose.

In addition, this Commission urges a more systematic effort at *functional budgeting* for R&D so that we know how we are spending the public's money in this area. More effective R&D portfolio management for research is needed with emphasis on critical R&D areas with high potential long-term benefits. We therefore recommend the following:

● 9: The President should empower his Science Advisor to establish non-military R&D objectives that meet changing national needs, and to be responsible for coordinating budget development within the relevant departments and agencies.

This budget, we believe, should emphasize research over development, and it should aim at large-scale experimental projects that can make best use of new synergies between theoretical advances and progress in scientific instrumentation.

We also believe that the President, in tandem with strengthening the White House Office of Science and Technology Policy, should raise the profile of its head—the Science Advisor to the President.

⁴ We believe that the creation of a counterintelligence "czar," announced by the out-going Clinton Administration on January 4, 2001, is a step in the right direction for this purpose. But proper inventory stewardship is a *precondition* for such a "czar" to be effective.

Founded in 1863 by Abraham Lincoln, the National Academy of Sciences today consists of four parts: the National Academy of Science, the National Academy of Engineering, the Institute of Medicine, and the National Research Council. The NAS advises the government, but it is not a government organization.

The Science Advisor needs to be empowered as a more significant figure within the government, and we believe the budget function we have recommended for him will be instrumental for this purpose.

There is yet another task that a strengthened OSTP should adopt. As things stand today, more than two dozen U.S. government agencies have science and technology responsibilities, meaning that they have personnel slots for science and engineering professionals and budget categories to support what those professionals do. (Of the several thousand such personnel in government, some 80 of these slots are for senior scientists and engineers who must be appointed by the President and confirmed by the Senate.)

Despite the significant numbers of science and technology (S&T) personnel and their obvious criticality, there is no place in the U.S. government where S&T personnel assets as a whole are assessed against changing needs. In the past two decades, the Congressional Research Service, the General Accounting Office, and the now-defunct Office of Technology Assessment have all explored this issue. The Office of Management and Budget, too, has looked regularly at individual departments and agencies, but not at the government's S&T personnel structure as such. It appears, then, that *no one above the departmental level examines the appropriateness of the fit between missions and personnel in this area as a whole.*

Dealing with government S&T personnel issues in a disaggregated manner is no longer adequate. It is hard for senior department and agency managers—and for the Office of Personnel Management (OPM) or the OMB staff—who are themselves not scientists or engineers, to know if they are operating with the right numbers and kinds of science and technology professionals. Hence, the Commission recommends that *the President, with aid from his Science Advisor directing NSF's National Science Board, should reassess and realign, as necessary, government needs for science and technology personnel for the next quarter century.*

Indeed, such a review ought to be made routine. The Science Advisor with the National Science Board and OPM, in consultation with the National Academies of Science, should periodically reevaluate Executive Branch needs for science and technology personnel. They should also suggest means to ensure the recruitment and retention of the highest quality scientists, engineers, and technologists for government service—a general subject we have noted above, and to which we return below in Section IV in the context of recommendation 42.

At present, as we have said, the U.S. government spends more than \$80 billion each year in publicly funded R&D, of which about half is defense related. Much of the budgeting, however, still reflects legacies of the Cold War and the Industrial Age. We do not suggest that this money is being wasted in any direct sense, but its benefits are not being maximized. For example, we believe that defense-related R&D should go back to funding more basic research, for in recent years it has tilted too much toward the “D” over the “R” in R&D.⁶

More important, we could derive more benefit from our investment in non-defense R&D if the context for it were a more competitive one. The Commission holds competition to be an important ingredient for the creative use of new ideas. Though we believe centralization of budget development is

⁶ Research accounts for approximately ten percent of DoD's \$38 billion R&D budget for fiscal year 2001. See AAAS Report XXV, *Research and Development FY 2001*, p. 71.

unnecessary, tailoring the various R&D budgets to meet overall national objectives would be beneficial. Different organizations address different needs and bring different perspectives, as do those working in different scientific disciplines. ***We therefore recommend that the President's Science Advisor, beyond his proposed budget coordination role, should lead an effort to revise government R&D practices and budget allocations to make the process more competitive.***

One barrier to a more competitive, opportunity-based environment for R&D is institutional inertia. The current structure of public R&D funding is partly a result of inherited arrangements. We do not suggest disrupting important relationships between particular government agencies and, say, the Lincoln Laboratory at M.I.T., for the turbulence created would not be worth the advantages. But if innovation is to be encouraged, we need greater competition for government R&D funds. Hence, ***we propose that the government foster a "creative market" for a greater number of research institutions to bid on government research funds.***

To create a more competitive market means narrowing the gap between the two tiers of research institutions that currently exist: the relatively small number of high-prestige major schools with ample endowments, and the larger number of less capable institutions. There are several ways to do this. One is through direct federal investment in or subsidization of second-tier institutions. Another is to encourage second-tier institutions to concentrate effort on new fields of inquiry in which older, more established institutions do not have comparative advantages. We see no reason, as well, to prevent amateurs from competing, because the history of science and technology is laden with the genius of the professionally uninitiated.

In addition, ***we recommend that a strengthened and more active National Science and Technology Council preside over an on-going effort to multiply creative, targeted R&D programs within government.*** The Council's enlarged professional staff should identify areas of priority research that the private sector is unlikely to pursue, and challenge those government agencies with R&D capabilities to form coalitions to bid on R&D monies set aside for such purposes. To meet such challenges, the National Aeronautics and Space Administration and the Defense Advanced Research Projects Agency might combine talents, in league with their associates outside of government, to bid against a Department of Energy-NSF team. The national laboratory system should also be involved in such competitions—a topic to which we now turn.

The U.S. national laboratory system is badly in need of redefinition and new investment. The national laboratories, though vestiges of the Cold War, remain a national R&D treasure. Unfortunately, they are a treasure in danger of being squandered.

Without any compelling force analogous to that of the Cold War to drive government funding and the direction of R&D, the labs have been left to drift. Nuclear research has given way mostly to maintenance of the nation's nuclear arsenal and efforts to dismantle nuclear weapons and manage their radioactive wastes. But however important, these are tasks that a single major laboratory can handle. Many of the other large and small laboratories within the system no longer have the sense of purpose and shared vision that drove the tremendous scientific accomplishments that advanced national security during the Cold War.

Compounding the labs' identity problem is the fact that the highest rewards and most interesting scientific and technical work now take place in the private sector. The Commission found broad consensus that the labs are no longer competitive in attracting and keeping new scientific talent. The

physical circumstances in which lab professionals work have also deteriorated, in many instances, to unacceptable levels.⁷ The security breaches and the subsequent series of investigations in recent years have produced a serious morale problem—and made recruitment and retention problems even more acute. If this cycle is not broken, our national advantage in S&T will suffer further.

The labs remain critical in fulfilling America's S&T national security needs and in addressing S&T issues pertinent to the public good. Each major laboratory needs a clearly defined mission area. The smaller labs, among the several hundred that exist, need to be better connected to one another so that their staffs share a sense of common purpose; in some cases, smaller labs may benefit from consolidation. The Commission therefore recommends the following:

● 10: The President should propose, and the Congress should fund, the reorganization of the national laboratories, providing individual laboratories with new mission goals that minimize overlap.

The President's Science Advisor, aided and advised by the OSTP, the NSTC, the PCAST, and the National Academy of Science, should lead this effort. For example, one lab could focus on nuclear weapons maintenance, while others could specialize in such fields as energy and environmental research, biotechnology, and nanotechnology. Whatever goals are determined, more resources are clearly needed to ensure that the national laboratories remain world class research institutions, with facilities, resources, and salaries to fulfill their missions.

Finally, the potential for good and ill stemming from many of the recent developments in the scientific and technical domain is at least as great, if not greater, than that of atomic energy in 1945-46. As this Commission stressed in its Phase I report, new scientific discovery and innovation in information technologies, nanotechnology, and biotechnologies will have a major impact on social, economic, and political life in the United States and elsewhere.

It is not in the public or the national interest to allow these impacts to be determined exclusively by the private sector. The United States prides itself on having a system of government that does not smother or try to shape the social or moral life of the nation. But we have always granted government a role in managing science and technology under special or extreme circumstances—as for example in the creation of the U.S. Atomic Energy Commission after World War II. As was the case then, a public-trust institution is needed to gather knowledge and to develop informed judgment as the basis for public policy. We especially need a permanent framework that brings public sector, private sector, and higher education together to examine the implications of today's technological revolution.

Now as then, there is a pointed national security dimension to this requirement. As was the case in the late 1940s, if the United States does not maintain leadership in this area, the country will forfeit its ability to protect itself from those countries that do.

At present, there is a National Bioethics Advisory Commission (NBAC) to study the moral implications of bioscience. This commission is composed of distinguished and committed members, but its composition is narrow, consisting mainly of bioethicists. As is the case with any federal commission, too, it meets only episodically, operates on a relatively small budget, and has but a modest professional

⁷ About 43 percent of the labs' physical facilities is more than forty years old, and 73 percent is more than twenty years old.

staff. In practice, this commission cannot influence or communicate as an equal with the National Institutes of Health, the Food and Drug Administration, the Department of Agriculture, or other government bodies that play major roles in monitoring and regulating the products of bioscience. Nor can it effectively anticipate issues when its meetings and reports are consumed mainly by concerns that have already been raised. In short, we believe that the NBAC is inadequate to the task of dealing with the looming public policy agenda sure to be generated by bioscience and biotechnology over the next quarter century.

We need an institution that provides a forum for the articulation of all responsible interests in the implications of new biotechnology and other new technologies. Without such a forum, it is doubtful whether public confidence in the progression of bioscience can be sustained amid all the controversies it will surely provoke over the next 25 years. We need a place where government officials, scholars, theologians, and corporate executives can meet regularly to discuss issues of concern. We need an institution that can deal effectively with the other governmental agencies regularly involved in these issues; otherwise its findings will remain peripheral to the actual processes of decision. ***We therefore recommend that Congress transform the current National Bioethics Advisory Commission into a much strengthened National Advisory Commission on Bioscience (NACB).***

The NACB should focus on the intersection of bioscience with information science and nanotechnology for, as we have said, it is this intersection that will form the pivot of major transformation. Such change will affect a wide range of public policy issues, including health, social security, privacy, and education. Nor should the NACB's mandate be limited to ethical questions. It should concern itself, as well, with the social and public safety implications of bioscience.

For now, we envision no regulatory authority for such a strengthened commission such as that possessed by the Atomic Energy Commission. However, should the Executive and Legislative Branches together come to believe that an institution along such lines is needed for biotechnology, this strengthened commission could serve as a basis for it.

B. EDUCATION AS A NATIONAL SECURITY IMPERATIVE

The capacity of America's educational system to create a 21st century workforce second to none in the world is a national security issue of the first order. As things stand, this country is forfeiting that capacity. The facts are stark:

- The American educational system needs to produce significantly more scientists and engineers, including four times the current number of computer scientists, to meet anticipated demand.⁸
- To do this, more than 240,000 *new and qualified* science and mathematics teachers are needed in our K-12 classrooms *over the next decade* (out of a total need for an estimated 2.2 million *new teachers*).⁹

⁸ National Commission on Mathematics and Science Teaching for the 21st Century, *Before It's Too Late* (Washington, DC: September 27, 2000), p. 12.

⁹ *Ibid.*, p. 21.

- However, some 34 percent of public school mathematics teachers and nearly forty percent of science teachers *lack even an academic minor* in their primary teaching fields.¹⁰

- In 1997, Asia alone accounted for more than 43 percent of all science and engineering degrees granted worldwide, Europe 34 percent, and North America 23 percent. In that same year, China produced 148,800 engineers, the United States only 63,000.¹¹

Education is the foundation of America's future. Quality education in the humanities and social sciences is essential in a world made increasingly "smaller" by advances in communication and in global commerce. But education in science, mathematics, and engineering has special relevance for the future of U.S. national security, for America's ability to lead depends particularly on the depth and breadth of its scientific and technical communities.

At the base of American national security, clearly, is the strength of the American economy. High-quality preparation of Americans for the working world is more important than ever. The technology-driven economy will add twenty million jobs in the next decade, many of them requiring significant technical expertise. The United States will need sharply growing numbers of competent knowledge workers, many of them in information sciences, an area in which there are already significant shortages.¹² But it is misleading to equate "information science" with "science" itself. It was basic science and engineering excellence that brought about the information revolution in the first place and, over the next quarter century, the interplay of bioscience, nanotechnology, and information science will combine to reshape most existing technologies. The health of the U.S. economy, therefore, will depend not only on professionals that can produce and direct innovation in a few key areas, but also on a populace that can effectively assimilate a wide range of new tools and technologies. This is critical not just for the U.S. economy in general, but specifically for the defense industry, which must simultaneously develop and defend against these same technologies.

The American educational system does not appear to be ready for such challenges and is confronted by two distinct yet inter-related problems. First, there will not be enough qualified American citizens to perform the new jobs being created today—including technical jobs crucial to the maintenance of national security. Already the United States must search abroad for experts and technicians to fill positions in the U.S. domestic economy, and Congress has often increased category limits for special visas (H-1B) for that purpose. If current trends are not stanchd and reversed, large numbers of specialized foreign technicians in critical positions in the U.S. economy could pose security risks. More important, however, while the United States should take pride in educating, hosting, and benefiting from foreign scientific and technical expertise, it should take even more pride in being able to educate American citizens to operate their own economy at its highest level of technical and intellectual capacity.

Our ability to meet these needs is threatened by a second problem—that we do not now have, and will not have with current trends, nearly enough qualified teachers in our K-12 classrooms, particularly in science and mathematics. The United States will need roughly 2.2 million new teachers within the next

¹⁰ U.S. Department of Education, National Center for Education Statistics, *1993-1994 Schools and Staffing Survey* (Teacher Questionnaire) (Washington, DC: 1997), p. 26.

¹¹ National Science Board, *Science and Engineering Indicators—1998* (Arlington, VA: National Science Foundation, 1998), p. A-36.

¹² We discuss these shortages and their implications for government below in Section IV.

decade.¹³ A continued shortage in the quantity and quality of teachers in science and math means that we will *increasingly* fail to produce sufficient numbers of high-caliber American students to advance to college and post-graduate levels in these areas. Therefore we will lack not only the homegrown science, technology, and engineering professionals necessary to ensure national prosperity and security, but also the next generation of teachers of science and math at the K-12 level.

A chronic shortage of teachers presages severe consequences in all fields, but is especially hurtful in science. Too few teachers means teaching loads and class sizes that exceed optimum levels. Having too many classes and too many students invariably translates into insufficient time to prepare, which is a *critical* variable in effective teaching—especially so in hands-on science classrooms. It also means the necessity to press into service teachers who are not adequately prepared for classroom rigors.

The broad effect of the shortages in science and math teachers, and of other deficits in curricula and method, is already evident. Mathematics and science exam scores for U.S. students have been rising, but not fast enough to keep up with a large number of other countries. The lag is particularly significant for the nation's high school students. Americans have performed relatively well in both mathematics and science at the 4th grade level, and slightly above the international average at the 8th grade level, but show a sharp relative decline in the high school years.¹⁴ The most recent test shows a relative decline at the 8th grade level as well.¹⁵ This, as former Secretary of Education William Bennett has pointed out, creates the impression that the longer students remain in the American education system, the poorer their relative performance becomes.

Another major concern is that not all American citizens have the benefits of an adequate education. Wide economic disparity persists among K-12 public school districts. Fully 34 percent of the total public school student population (seventeen million children) is being educated in economically-depressed school districts that face the greatest shortages of teachers. Many teachers in these districts are not qualified by a degree in the field they teach, and many lack teaching certification as well. The disparity in the availability of qualified science and math teachers between regular and economically-depressed school districts is particularly alarming.

¹³ This is because the majority of public school teachers are currently in their forties, with the normal retirement age being around 65 years old. U.S. Department of Education, National Center for Education Statistics, "Schools and Staffing Survey."

¹⁴ In 1995, the Third International Mathematics and Science Study (TIMSS) ranked the performance of American 12th graders in general mathematics and science knowledge among the lowest of all participating countries. Americans placed 19th out of 21 in general mathematics and 17th out of 21 in general science. In advanced mathematics and physics knowledge, American 12th graders placed 15th out of 16 in mathematics and dead last in physics. In all content areas of physics and advanced mathematics, the American students' performance was among the lowest of all the nations participating in the TIMSS. Some observers question the utility of these tests on the grounds that in many other countries only the brightest students take the test because children are separated into vocational and college tracks at an early age. Most believe, however, that the test results are instructive of general trends.

¹⁵ See Diana Jean Schemo, "Students in U.S. Do Not Keep Up in Global Tests," *The New York Times*, December 6, 2000, pp. A1, A18.

In short, our problems in this area are becoming cumulative. The nation is on the verge of a downward spiral in which current shortages will beget even more acute future shortages of high-quality professionals and competent teachers. The word “crisis” is much overused, but it is entirely appropriate here. If the United States does not stop and reverse negative educational trends—the general teacher shortage, and the downward spiral in science and math education and performance—it will be unable to maintain its position of global leadership over the next quarter century.

Resolving these cumulative problems will require a multi-faceted set of solutions. Educational incentive programs are needed to encourage students to pursue careers in science and technology, and particularly as K-12 teachers in these fields. Yet such incentives alone will not be adequate to avert the looming teacher shortage. Therefore, a set of additional actions must be taken to restore the professional status of educators and to entice those with science and math backgrounds into teaching. Only by addressing the systemic need to increase the number of science and math teachers will we ensure the supply of qualified science and technology professionals throughout our economy and in our national security institutions, both governmental and military.

As a major first step, we therefore recommend the following:

- **11: The President should propose, and Congress should pass, a National Security Science and Technology Education Act (NSSTEA) with four sections: reduced-interest loans and scholarships for students to pursue degrees in science, mathematics, and engineering; loan forgiveness and scholarships for those in these fields entering government or military service; a National Security Teaching Program to foster science and math teaching at the K-12 level; and increased funding for professional development for science and math teachers.**

Section one of the National Security Science and Technology Education Act should provide incentives for students at all levels—high school, undergraduate, graduate, and post-graduate—to pursue degrees in the fields of science, mathematics, and engineering.

Section two should provide substantial incentives to bring talented scientists, mathematicians, and engineers into government service—both civil and military. [The social science complement to this section is discussed in recommendation 39.]

Section three should address the need to recruit quality science and math teachers at the K-12 level. To accomplish this goal, Congress should create a National Security Teaching Program through which graduates and experienced professionals in the fields of science, math, and engineering will commit to teach in America’s public schools for three to five years. In return, NSTP Fellows will receive fellowships to an accredited education certification program, a loan repayment or cancellation option, and a signing bonus to supplement entry-level salaries. A national roster of districts in need of qualified teachers should be compiled and matched with the roster of NSTP Fellows.

The National Security Teaching Program will place teachers in the classroom who have both a teaching certification and a degree in their field. It will also encourage experienced professionals to teach, bringing deep subject matter expertise and a wealth of experience into America’s classrooms.¹⁶ These

¹⁶ The National Academy of Sciences/National Research Council, through its Center for Science, Mathematics, and Engineering Education, has completed the Defense Reinvestment Initiative (DRI) funded by the Department of Defense. The program worked with the Los Angeles Unified School District to build a model for the transition of

lateral entrants might be Ph.Ds who have not found other suitable professional niches and “young” retired people, such as those who leave the military in their forties and fifties.¹⁷ Enabling this latter group to teach will also require further changes in tax laws so that those receiving retirement and pension benefits are not penalized unduly for taking on a second educational career.

Section four must emphasize professional development focused on the needs of science and mathematics teachers. On-going professional development for science teachers is particularly important, as they must prepare their students to contend with the rapidly evolving pace of scientific innovation and discovery. The Eisenhower Program run by the Department of Education to meet the professional development needs of science and math teachers is a good example of a program that works.¹⁸ It should be expanded and resourced accordingly.

Professional development that involves a substantial number of contact hours over a long period has a stronger impact on teaching practice than professional development of limited duration. Today, however, more than half of all science teachers in the United States report receiving no more than two days of professional development per year.¹⁹ For this reason, we believe the emphasis of the National Commission on Mathematics and Science Teaching for the 21st Century (the Glenn Commission) on continuing professional education is right on the mark. The Glenn Commission emphasized Summer Institutes as well as Inquiry Groups and distance learning through a dedicated Internet portal for on-going professional education.²⁰

Congress should also establish and fund a National Math & Science Project to provide additional support for continuing professional development. Such a program can be modeled after the National Writing Project, an outstanding example of university/district collaboration. Its goal has been to improve student writing and learning in K-12 and university classrooms by providing schools, colleges, and universities with an effective professional development model. The National Writing Project also suggests itself as a model because it has been both cost-effective and has focused significant resources on traditionally-neglected impoverished areas.²¹

All fifty states should also fund professional enrichment sabbaticals of various durations for science teachers, and should do so wherever possible in concert with local universities, science museums, and other research institutions. The federal government should strongly encourage and support the states in such endeavors. A more widespread sabbatical system for science educators would also improve liaison between secondary school teachers of science and math and university faculties adept in such subjects. Some metropolitan areas in the United States have developed excellent working relationships between high school teachers and both university and science museum faculties, and we encourage Education Department officials to carefully study and model these success stories.

professional scientists, mathematicians, and engineers from military duty, defense-related and aerospace industries, and national laboratories into careers teaching secondary school science and mathematics. See the *Final Report to the U.S. Department of Defense on the Defense Reinvestment Initiative*, Defense Reinvestment Initiative Advisory Board, National Research Council, 1999. <http://www.nap.edu>.

¹⁷ As recommended by the National Academy of Science in *Attracting Science and Mathematics Ph.Ds to Secondary School Education* (Washington, DC: National Academy Press, 2000).

¹⁸ The Eisenhower Professional Development Program (Title II of the Elementary and Secondary Education Act, as amended by the Improving America's Schools Act of 1994) focuses on the professional development of mathematics and science teachers. See U.S. Department of Education, Office of the Under Secretary, Planning and Evaluation Service, *Designing Effective Professional Development: Lessons from the Eisenhower Program, Executive Summary* (Washington, DC: 1999).

¹⁹ “ETS Report Discusses Teacher Quality,” *NSTA Reports*, Dec. 2000-Jan. 2001, p. 11.

²⁰ *Before It's Too Late*, pp. 19, 26-30.

²¹ National Writing Project, *1999 Annual Report*.

We recognize that the widespread institution of enrichment sabbaticals for science teachers would be expensive, for it would require a personnel “float” to compensate for teachers who are on sabbatical. But this should be a long-term goal for science educators in at least grades 7-12, which should come to resemble professional standards at universities to the extent possible.

While the National Security Science and Technology Education Act would provide educational benefits and ongoing professional development opportunities for those who choose to teach, a range of additional actions are needed to improve both teacher recruitment and retention and the overall strength of school districts.

The anticipated shortage of quality teachers is a challenge, *but it also offers tremendous opportunity*. As we renew our pool of teachers, we can produce and train the best teachers with the best curricula, the best texts, and the best teaching methods. It is clear, too, that if the general national teacher shortage problem is not addressed, *efforts to address deficiencies in the science and mathematics arena will not be met either*. One cannot significantly improve the quality of science and math education without improving education in general. After all, science and math are taught in the same buildings, working under the same systems and budgets, and in the same general environment as that in which all other subjects are taught. That is why ensuring a superior scientific and technical community, one that satisfies both national economic and security needs, must start with reforming the educational system as a whole.

In this light, the Commission recognizes the need to take immediate steps, beyond the National Security Teaching Program, to attract much greater numbers of qualified graduates into the teaching profession, and to raise the quality of professional achievement across the board. We therefore recommend:

- **12: The President should direct the Department of Education to work with the states to devise a comprehensive plan to avert a looming shortage of quality teachers. This plan should emphasize raising teacher compensation, improving infrastructure support, reforming the certification process, and expanding existing programs targeted at districts with especially acute problems.**

First, we must *raise salaries for teachers*, science and mathematics teachers in particular, to or near commercial levels.²² As long as sharp salary inequities exist between what science and math teachers are paid and what equivalently-educated professionals make in the private sector, the nation’s schools will lack the best qualified teachers in science and mathematics. Given the exigencies of the market, we see no reason why science and math teachers should not earn more than other teachers even in the same school system.

While increased funding from the federal and state governments is needed to achieve this, public-private and community-wide partnerships that link universities and businesses with local school districts

²² In lieu of or in addition to raising salaries, which may be restricted in some places by issues of inter-jurisdictional equity and union complications, signing bonuses can be used to attract people to teaching.

could help fulfill both faculty and student needs through endowments and other programs.²³ Endowments are a proven means for enhancing professional competitiveness. Beyond their contribution to funding higher teacher salaries, they involve corporate and private philanthropy more effectively in improving American education. K-12 education should develop a resource base similar to that of higher education with which to meet educational needs. The federal government—through the Department of Education, the National Science Foundation, and the National Research Council—can also help by standing ready to provide supplementary or matching funds for communities that take bold local initiatives to recruit and retain quality teachers. National, state, and local leaders should encourage corporate and private philanthropists to match disbursed endowment money, and Congress should work to ensure enhanced corporate tax benefits for monies provided for NSSTEA science/math education purposes of all sorts.

Endowment and other partnership programs could be used in several important ways, in addition to raising teacher salaries. They can provide the up-to-date laboratory facilities that are essential to effective discovery-based learning, and that are usually more expensive than most local school districts choose to bear. Without investment by the federal government and through these partnership programs in the modernization of high school laboratory facilities, even the highest quality science teachers will be unable to maximize their talents. Funds could also be used to develop innovative uses for technology such as up-to-date modular texts in science that can be conveyed nationwide through the Internet.

Finally, these programs can provide student incentives to choose science and math careers. This may be through summer co-op programs—somewhat analogous to co-op programs on the university level—where students take summer jobs or internships related to their interests at companies and foundations that help endow the schools. Alternatively endowments might be used to pay students at the high school level for taking courses in science and math beyond minimal requirements. Some believe that it is foolish to let students work at fast food chains, for example, when they could be induced for similar rewards to study physics and calculus. In lieu of, or in addition to, direct payment, students may be offered scholarship money to be set aside for university tuition.

Second, we must improve infrastructure support. Other knowledge-workers in the general economy are the beneficiaries, on average, of ten times the basic infrastructure investment than that afforded to teachers. This is a national disgrace. Beyond the laboratory facilities already mentioned, administrative support and resources are needed to ensure a disciplined and safe environment, and to provide such seemingly basic services as desk space, telephones, and copying facilities. This will not only help provide a better educational environment but, along with salary increases, will also help restore full professional status to the teaching profession. This will go a long way toward attracting and retaining high-quality teachers.

Third, we must create more flexible certification procedures to attract lateral entrants in to education. We have already discussed the benefits of encouraging experienced professionals to become K-12 educators and certification procedures should reflect these benefits. In general they should be changed to emphasize teacher mastery of substance over matters of pedagogy at least at the grade 7-12 level.

²³ We note the successful example of the Long Beach Unified School District. Over the past five years, it has partnered with California State University Long Beach (CSULB), and Long Beach City College, in collaboration with additional local, regional, and national partners, to develop a seamless (preK-18) approach that has aligned content standards, learning methodology, and assessment from pre-school through the masters level. The aim is to ensure coherent exit and entry expectations among the three institutions. They have collaborated to address curriculum, preparation, and professional development issues as well.

Fourth, we should supplement these measures by expanding existing specially-targeted federal programs for geographical and socio-economic zones with especially acute problems. Through the National Security Teaching Program, we should strengthen federal loan repayment and cancellation options for recent college graduates engaged in these programs and increase their salary and housing benefits. Supplementary teacher training and certification programs should be provided, as well, in exchange for an additional commitment to teaching in selected public school systems. At the same time, we recommend the following:

- **13: The President and Congress should devise a targeted program to strengthen the historically black colleges and universities in our country, and should particularly support those that emphasize science, mathematics, and engineering.**

Clearly, serious educational improvement will cost money. It will also require changes in attitudes toward education professionals. But if the American people want quality education and a truly professional environment in schools that is conducive to educational success, they will have to demand it, pay for it, and show greater respect to those professionals who deliver it.

We believe, however, that while more money for is a necessary condition for major improvement in the education system, it is not a sufficient condition. Despite significant investments in special programs, much professional attention, and significant expenditure of resources, many results of the educational system are still disappointing. New and creative approaches are needed, including approaches that harness the power of competition. As important, local communities must be empowered and involved more fully in education, for nothing tracks more directly with high student performance as parental involvement in their children's education.

In addition to the previous recommendations, this Commission believes that core secondary school curricula should be heavier in science and mathematics, and should require higher levels of proficiency for all high school students. Many specialists believe that tracking math and science students sometimes leads to a sharp deterioration of expectations, and hence discipline, in the lower tracks. According to nearly all professional evaluations, such a deterioration of expectations is lethal to the attitudes necessary to make the classroom experience work.²⁴ Given the exigencies of advanced 21st century economies, it is not good enough that we produce a sufficient elite corps of science, math, and engineering professionals. We must raise levels of math, science, and technology literacy throughout our society. Among other things, that means changing enduring perceptions that taking four years of science and math in high school is only for the "brainy" elite. This is a perception that, ultimately, could cause an economic disaster in this country.

Finally in this regard, as with nearly every other commission and professional study that has looked at this problem, we favor more rigorous achievement goals for both American teachers and students in science and math, and we favor making both accountable for improvements. We also believe that science curricula, in particular, must be better designed to teach science for what it is: a way of thinking and not just a body of facts. In our judgment, too much high school science curricula is still distorted by inappropriate evaluation methods. If testing and evaluation methods for science education better reflect the reality of science as a discovery-based rather than as a fact-based activity, it would be easier to reform curricula in an appropriate fashion as well.

²⁴ "New Study Examines Why Minnesota Eighth Graders Scored High in TIMMS," *NSTA Reports*, Dec. 2000-Jan. 2001, p. 23.

One related matter must be addressed. As noted earlier, increasing numbers of the qualified engineers and scientists educated in the United States are coming from outside U.S. borders. Far from being negative, the cycle of their coming and going to and from the United States helps sustain U.S. needs. However, should they stop coming, or further accelerate their return home, the American population alone may not be able to sustain the needs of the U.S. economy over the next decade.

Fully 37 percent of doctorates in natural science, 50 percent of doctorates in mathematics and computer science, and 53 percent of doctorates in engineering at U.S. universities—the best in the world—are awarded to non-U.S. citizens.²⁵ However, the percentage of science and engineering doctoral recipients with firm plans to stay in the United States is declining.²⁶ The growing emphasis on science and technology in many foreign countries is enticing many U.S.-trained foreign students to return to their countries of origin, or to go to other parts of the world. They are doing so in increasing numbers.

Given the uncertainty as to whether U.S. nationals alone can fill U.S. economic needs, Congress should adjust the appropriate immigration legislation to make it easier for those non-U.S. citizens with critical educational and professional competencies to remain in the United States, and to become American citizens should they so desire. The White House Office of Science and Technology Policy, along with the Immigration and Naturalization Service and the appropriate Congressional committees, is the proper place to design such adjustments.

We believe strongly that America's future depends upon the ability of its educational system to produce students who constantly challenge current levels of innovation and push the limits of technology and discovery. They are the seed corn of our future. Presidential leadership will be critical in addressing the initiatives in education addressed by this Commission. That is why the Commission is heartened to learn that the new administration has declared education to be its first priority. It is the right choice.

IV. The Human Requirements for National Security

As it enters the 21st century, the United States finds itself on the brink of an unprecedented crisis of competence in government. The maintenance of American power in the world depends on the quality of U.S. government personnel, civil and military, at all levels. We must take immediate action in the personnel area to ensure that the United States can meet future challenges.

In its Phase I report, this Commission asserted that “the ability to carry out effective foreign and military policies requires not only a skilled military, but talented professionals in all forms of public service as well.”²⁷ We reaffirm here our conviction that the quality of personnel serving in government is critically important to U.S. national security in the 21st century. The excellence of American public servants is

²⁵ National Science Board, *Science & Engineering Indicators 2000*, National Science Foundation, 2000 (NSB-00-1).

²⁶ *Ibid.* According to the best estimates available, the numbers are 47.9 percent for China, 27.5 percent for Taiwan, 22.6 percent for Korea, 54.7 percent for India, 52.6 percent for the United Kingdom, and 40.5 percent for Germany.

²⁷ *New World Coming*, p. 130.

the foundation upon which an effective national security strategy must rest—in large part because future success will require the mastery of advanced technology, from the economy to combat, as well as leading-edge concepts of governance. We therefore repeat our conclusion from the Phase II report, that the United States “must strengthen government (civil and military) personnel systems in order to improve recruitment, retention, and effectiveness at all levels.”²⁸

In this light, the declining orientation toward government service as a prestigious career is deeply troubling. The problem manifests itself in different ways throughout various departments, agencies, and the military services, yet all face growing difficulties in recruiting and retaining America’s most promising talent. These deficits are traceable to several sources, one of which is that the sustained growth of the U.S. economy has created private sector opportunities with salaries and advancement potential well beyond those provided by the government. This has a particular impact in shaping career decisions in an era of rising student debt loads. The contrast with the private sector is also organizational. In government, positions of responsibility and the ability to advance are hemmed in by multiple layers, even at senior levels; in the private sector, both often come more quickly. Rigid, lengthy, and arcane government personnel procedures—including those germane to application, compensation, promotion, retirement, and benefits systems—also discourage some otherwise interested applicants.

Another source of the problem is that there is no single overarching motivation to entice patriotic Americans into public service as there was during the Cold War. Careers in government no longer seem to hold out the prospect for highly regarded service to the nation. Meanwhile, the private and non-profit sectors are now replete with opportunities that have broad appeal to idealistic Americans who in an earlier time might have found a home within government service. Government has to compete with the private sector not only in salary and benefits, then, but often in terms of the intrinsic interest of the work and the sense of individual efficacy and fulfillment that this work bestows.

At the same time, the trust that Americans have in their government is buffeted by worrisome cynicism. Consistent criticism of government employees and agencies by politicians and the press has magnified public dissatisfaction and lowered regard for the worthiness of government service. Political candidates running “against Washington” have fueled the impression that all government is prone to management and services of a quality below that of similar organizations in the private sector. This is not the case, but virtually every Presidential candidate in the past thirty years has deployed campaign rhetoric criticizing “the bloated bureaucracy” as a means of securing “outsider” status in the campaign. Neither critics nor their audiences often differentiate between performance failures based on political maneuvering and the efforts of apolitical professional public servants striving to implement policy. The cumulative effect of this rhetoric on public attitudes toward the government is demonstrated in a 1999 study highlighting American frustration with “the poor performance of government” and “the absence of effective public leadership.”²⁹

A final reality is that today’s technological age has created sweeping expectations of speed, accuracy, and customization for every product and service. Government is not immune to these expectations, but its overall reputation remains that of a plodding bureaucracy. Talented people seeking careers where they can quickly make a difference see government as the antithesis to best management practices, despite many government improvements in this area. Part of the recruitment and retention

²⁸ *Seeking a National Strategy*, p. 9.

²⁹ Panel on Civic Trust and Citizen Responsibility, *A Government to Trust and Respect: Rebuilding Citizen-Government Relations for the 21st Century* (Washington, DC: National Academy of Public Administration, 1999), p. iii.

problem, therefore, flows from the image of overall government management and must be addressed by making government more effective and responsive at every level.

The effect of these realities on recruiting and retention problems is manifest. The number of applicants taking the Foreign Service entrance exam, for example, is down sharply and the State Department shows signs of a growing retention problem. The national security community also faces critical problems recruiting and retaining scientific and information technology professionals in an economy that has made them ever more valuable. The national security elements of the Civil Service face similar problems, and these problems are magnified by the fact that the Civil Service is doing little recruiting at a time when a retirement wave of baby-boomers is imminent.

For the armed services, the aforementioned trends have widened the cultural gap between the military and the country at large that continues to be affected by the abolition of the draft in the 1970s. While Americans admire the military, they are increasingly less likely to serve in it, to relate to its real dangers and hardships, or to understand its profound commitment requirements. With a total active strength of 1.4 million, only one-half of one percent of the nation serves in the military. Military life and values are thus virtually unknown to the vast majority of Americans.

The military's capabilities, professionalism, and unique culture are pillars of America's national strength and leadership in the world. Without a renewed call to military service and systemic internal personnel reform to retain quality people, the requisite leadership and professionalism necessary for an effective military will be in jeopardy. For this reason, the Commission asserted in its Phase II report that the "United States must strengthen the bonds between the American people and those of its members who serve in the armed forces."³⁰ We reaffirm that assertion here.

A. A NATIONAL CAMPAIGN FOR SERVICE TO THE NATION

To remedy these problems, the Commission believes that *a national campaign to reinvigorate and enhance the prestige of service to the nation* is necessary to attract the best Americans to military and civilian government service. The key step in such a campaign must be to revive a positive attitude toward public service. It has to be made clear from the highest levels that frustrations with particular government policies or agencies should not be conveyed through the denigration of federal employees *en masse*. Calls for smaller government, too, should not be read as indictments of the quality of government servants. Instead, specific issues should be addressed on the merits, while a broader campaign should be waged to stress the importance of public service in a democracy.

Implementing such a campaign requires strong and consistent Presidential commitment, Congressional legislation, and innovative departmental actions throughout the federal government. We know this is a tall order, but we take heart in previous examples of such leadership. The clarion call of President John F. Kennedy, encompassed in but a few well-chosen remarks spread over several speeches, had enormous impact and inspired an entire generation to public service. We also remember how President Ronald Reagan reinvigorated the spirit of the U.S. military after the tragedies of the Vietnam War and subsequent periods of low funding and plummeting morale. What the President says, and how he

³⁰ *Seeking a National Strategy*, p. 9.

says it, matters. Moreover, only the President can shape the Executive Branch agenda to undertake the changes needed in U.S. personnel systems.

While the President's involvement is central, other leaders must help build a new foundation for public service. Congress must be convinced not only to pass the legislative remedies proffered below, but also to change its own rhetoric to support national service. It must work with department heads and other affected institutions to ensure that a common message is conveyed, and that Executive departments and agencies have the flexibility they need to make real improvements.

Rhetoric alone, however, will not bring America's best talent to public service. The Commission believes that unless government service is made competitively rewarding to 21st century future leaders, words will surely fade to inaction. Section II of this report highlighted the urgent national need for outstanding science and technology professionals. So, too, does government need high-quality people with expertise in the social sciences, foreign languages, and humanities. The decreased funding available for these programs from universities and foundations may threaten the ability of the government to produce future leaders with the requisite knowledge—in foreign languages, economics, and history to take several examples—to meet 21st century security challenges.

Therefore this Commission proposes a complement to the National Security Science and Technology Education Act (NSSTE A) presented in recommendation 11 of this report. As in the case of the NSSTE A, which applies to math and hard science majors, we would extend scholarship and debt relief benefits to those social science, foreign language, and humanities students who serve the nation. We therefore make the following recommendation:

● 39: Congress should significantly expand the National Security Education Act (NSEA) to include broad support for social sciences, humanities, and foreign languages in exchange for military and civilian service to the nation.³¹

The current National Security Education Act (NSEA) of 1991 provides limited undergraduate scholarships and graduate fellowships for students to study certain subjects, including foreign language and foreign area studies. The Act also allows the use of funds at institutions of higher learning to develop faculty expertise in the languages and cultures of less commonly studied countries. Recipients of these funds incur an obligation either to work for an office or agency of the federal government involved in national security affairs, or to pursue careers as educators for a period equal to the time covered by the scholarship.³²

An expanded Act would increase the subjects currently designated for study, offering one- to four-year scholarships good for study at qualified U.S. universities and colleges. Upon completion of their studies, recipients could fulfill their service in a number of ways: in the active duty U.S. military; in National Guard or Reserve units; in national security departments and agencies of the Civil Service; or in the Foreign Service. To prepare students to fulfill their service requirements, the scholarship program

³¹ Our model is the National Defense Education Act of the late 1950s and 1960s, which provided loan forgiveness incentives for those willing to serve in the military or teach in schools with disadvantaged students or in disadvantaged areas. That act provided scholarships to those studying hard sciences and mathematics, as well as those studying critical foreign languages where the country at large confronted significant deficiencies.

³² National Security Education Act 1991 (Public Law 102-183—December 4, 1991.)

should include a training element. One model of this training might be a civilian equivalent of the Reserve Officers Training Corps (ROTC) or Platoon Leader Course (PLC).³³

The Act should also provide for those who choose government service after completing their education. In those cases, the Act could offer several sorts of incentives in lieu of scholarships foregone. One such incentive would be the deferral of educational loan repayment while individuals serve in government. Another would reduce school loan principal amounts by a set percentage for every year the individual stays in government service up to complete repayment.³⁴ In such cases, the government would assume the financial obligations of the graduate, so that neither financial nor educational institutions suffer.

The Commission believes the combination of the NSSTEA for math and science, and for other majors this significantly expanded NSEA will prepare Americans for many forms of service and more generally help recruit high-quality civil service and military personnel.

B. THE PRESIDENTIAL APPOINTMENTS PROCESS

A concerted campaign to improve the attractiveness of service to the nation is the first step in ensuring that talented people continue to serve in government. However, fundamental changes are also needed to personnel management systems throughout the national security agencies of government. Not least among the institutions needing reform is the Presidential appointments system.

The problem with government personnel starts at the top. Unlike many other countries, the United States staffs the high levels of its national government with many outside, non-career personnel. The most senior of these are Presidential appointees whose positions require Senate confirmation. While career personnel provide much-needed expertise, continuity, and professionalism, Presidential appointees are a source of many valuable qualities as well—fresh ideas, experience outside government, specialized expertise, management skills, and often an impressive personal dynamism. They also ensure political accountability in policy execution, by transmitting the President’s policies to the departments and agencies of government. Indeed, the tradition of public-spirited citizens coming in and out of government is an old and honorable one, serving the country well from the days of George Washington. This infusion of outside skills is truly indispensable today, when the private sector is the source of so much of the country’s managerial and technological innovation.

What a tragedy, then, that the system for recruiting such outside talent has broken down. According to a recent study, “the Founders’ model of presidential service is near the breaking point” and “the presidential appointments process now verges on complete collapse.”³⁵ The ordeal to which outside nominees are subjected is so great—above and beyond whatever financial or career sacrifice is involved—as to make it prohibitive for many individuals of talent and experience to accept public service. To take a vivid recent example: “The Clinton Administration . . . had great difficulty filling key Energy Department positions overseeing the disposal of nuclear waste because most experts in the field

³³ The Marine Corps PLC scholarship program is similar to the ROTC program, but is not affiliated with a particular learning institution and is not tied to an actual cadre unit at a specific school.

³⁴ A limited version of this loan reduction concept is currently under development in a portion of the Civil Service. See “Proposed Rules—Repayment of Student Loans,” *Federal Register*, June 22, 2000, pp. 38791-38794.

³⁵ Paul C. Light and Virginia L. Thomas, *The Merit and Reputation of an Administration: Presidential Appointees on the Appointments Process* (Washington, DC: The Brookings Institution and The Heritage Foundation, April 28, 2000), p. 3.

came directly or indirectly from the nuclear industry and were thus rejected for their perceived conflicts of interest.”³⁶ The problem takes several forms.

First, there are extraordinary—and lengthening—delays in the vetting and confirmation process. On average, the process for those appointees who required Senate confirmation has lengthened from about two and one-half months in the early 1960s to an extraordinary eight and one-half months in 1996—suggesting that many sub-cabinet positions in the new administration will be fortunate to be in place by the fall of 2001.³⁷ As Norman Ornstein and Thomas Donilon point out: “The lag in getting people into office seriously impedes good governance. A new president’s first year—clearly the most important year for accomplishments and the most vulnerable to mistakes—is now routinely impaired by the lack of supporting staff. For executive agencies, leaderless periods mean decisions not taken, initiatives not launched, and accountability not upheld.”³⁸ The result is a gross distortion of the Constitutional process; the American people exert themselves to elect a President and yet he is impeded from even beginning to carry out his mandate until one-sixth of his term has elapsed.

Second, the ethics rules—conflict of interest and financial disclosure requirements—have proliferated beyond all proportion to the point where they are not only a source of excessive delay but a prohibitive obstacle to the recruitment of honest men and women to public service. Stacks of different background forms covering much of the same information must be completed for the White House, the Senate, and the FBI (in addition to the financial disclosure forms for the Office of Government Ethics). These disclosure requirements put appointees through weeks of effort and often significant expense. The Defense Department and Senate Armed Services Committee routinely force nominees to divest completely their holdings related to the defense industry instead of exploring other options such as blind trusts, discretionary waivers, and recusals.³⁹ This impedes recruiting high-level appointees whose knowledge of that industry should be regarded as a valuable asset to the office, not reason for disqualification.

The complexity of the ethics rules is not only a barrier and a time-consuming burden before confirmation; it is a source of traps for unwary but honest officials after confirmation. This is despite the fact that the U.S. federal government is remarkable for the rarity of real corruption in high office compared to many other advanced societies. Yet we proliferate “scandals” because of appearances of improprieties, or inadvertent breaches of highly technical provisions. Worse, these rules are increasingly matters of *criminal* rather than administrative remedies. It appears to us that those who have written these conflict of interest regulations themselves have little conflict of experience in such matters.

Third, and closely related, are the post-employment restrictions that a new recruit knows he or she must endure, particularly appointees subject to Senate confirmation. We will simply cease to attract talented outsiders who have a track record of success if the price for a few years of government service is to forsake not only income but work in the very fields in which they had demonstrated talent and found success. The recent trend has been to *add* to the restrictions. However, we applaud the recent revocation of Executive Order 12834 as an important step in removing some unnecessary restrictions.⁴⁰

³⁶ Norman Ornstein and Thomas Donilon, “The Confirmation Clog,” *Foreign Affairs*, November/December 2000, p. 91.

³⁷ Defense Science Board, *Final Report of the Defense Science Board Task Force on Human Resources Strategy* (Washington, DC: Office of the Secretary of Defense, February 2000), p. 41.

³⁸ Ornstein and Donilon, p. 89.

³⁹ Defense Science Board, p. D-6.

⁴⁰ The recently-rescinded Executive Order 12834, signed by President Clinton on January 20, 1993, his first day in office, extended to five years the previous one-year ban on an ex-official’s appearance before his or her former agency. This restriction was placed on the most senior presidential appointees. All former employees face certain limitations, but Senate-confirmable employees paid at the EL-V or EL-IV level (and non-career SES appointees

A fourth dimension of the problem is the proliferation of Presidential-appointee positions. In the last 30 years, the number of Senate-confirmable Presidential-appointee positions throughout the federal government has quadrupled, from 196 to 786. Within the Defense Department, the figure has risen from 31 to 45 during the same period.⁴¹ The growing number of appointees contributes directly to the backlog that slows the confirmation process. It also makes public service in many of these positions less attractive; as the Defense Science Board noted in the case of the Defense Department, “an assistant secretary post may be less attractive buried several layers below the secretary than as a number two or three job.”⁴² Moreover, Presidential appointments can hardly serve as a transmission belt of Presidential authority if multiple layers of political appointees diffuse accountability and make departments and agencies more cumbersome and less responsive. And it runs glaringly counter to the trend in today’s private sector toward flatter and leaner management structures.

Finally, the appointments process feeds the pervasive atmosphere of distrust and cynicism about government service. The encrustation of complex rules is based on the presumption that all officials, and especially those with experience in or contact with the private sector, are criminals waiting to be unmasked. Congress and the media relish accusations or suspicions, whether substantiated or not. Yet the U.S. government will not be able to function effectively unless public service is restored to a place of honor and prestige, especially for private citizens who have achieved success in their chosen fields.

We need to rebuild the present system nearly from the ground up, and the beginning of a new administration is the ideal time to start. Our recommendations support those made in the Defense Science Board’s Human Resource Study, in the joint survey undertaken by the Brookings Institution and the Heritage Foundation, and by Norman Ornstein and Thomas Donilon. We therefore recommend the following:

● 40: The Executive and Legislative Branches should cooperate to revise the current Presidential appointee process by reducing the impediments that have made high-level public service undesirable to many distinguished Americans. Specifically, they should reduce the number of Senate confirmed and non-career SES positions by 25 percent; shorten the appointment process; and moderate draconian ethics regulations.

Reducing non-career positions would, as the Defense Science Board has noted, “allow more upward career mobility for Senior Executive Service employees and provide greater continuity and corporate memory in conducting the day-to-day business affairs of the Defense Department during the transition between administrations.”⁴³ Recommendation 43 below to create a National Security Service Corps should help ensure that career employees develop the qualifications to be eligible to hold senior positions throughout the government.

The aim of reducing the number of Presidential appointees is not to weaken Presidential political authority over the bureaucracy, but to eliminate the excessive layering that clogs the government’s functioning in addition to slowing the appointment process. That said, an exact balance between political and career appointees cannot be specified in the abstract. Both groups include skilled and talented people.

whose salaries fall within this range) face additional regulations potentially very harmful to their post-service careers. Under Executive Order 12834, they could not lobby their former agency for five years, while other appointees are restricted only for one year. See Defense Science Board, p. D-7 and the relevant section of the U.S. Code, 18 USC §207.

⁴¹ Defense Science Board, pp. 42-43.

⁴² *Ibid.*, p. 43.

⁴³ *Ibid.*, p. 44.

But Presidents should be held to a qualitative standard—that political appointees, whether for Ambassadors or for policymaking positions in Washington, should be chosen for the real talents they will bring and not the campaign contributions they brought. [See recommendation 23]

To streamline and shorten the current appointment process, the President and leaders of the new Congress should meet as soon as possible to agree on the following measures.

- CONFIRM THE NATIONAL SECURITY TEAM FIRST. By tradition, the Senate Foreign Relations, Armed Services, and Intelligence committees hold hearings before inauguration on the nominees for Secretaries of State and Defense and the Director of Central Intelligence, and vote on inauguration day. This practice should continue. Future Presidents should also present to the Senate no later than inauguration day his nominees for the top ten positions at State and at Defense and the top three posts at CIA. Leaders of the relevant committees should agree to move the full slate of appointments to the full Senate within 30 days of receiving the nomination (barring some serious legitimate concern about an individual nominee).⁴⁴
- REDUCE AND STANDARDIZE PAPERWORK REQUIREMENTS. The “Transition to Governing Project” jointly undertaken by the American Enterprise Institute and the Brookings Institution is developing software that will enable appointees to collect information once and direct it to the necessary forms. The new President should direct all relevant agencies and authorities to accept these computerized forms and to streamline the paperwork requirements for future appointees.⁴⁵
- REDUCE THE NUMBER OF NOMINEES SUBJECT TO FULL FBI BACKGROUND CHECKS. Full field investigations should be required only for national security or other sensitive top-level posts. Most other appointees need only abbreviated background checks, and part-time or lesser posts need only simple identification checks.⁴⁶ The risks to the Republic of such an approach are minor and manageable, and are far outweighed by the benefit that would accrue in saved resources and expedited vetting.
- LIMIT ACCESS TO FULL FBI FILES. Distribution of raw FBI files should be severely restricted to the chairman and ranking minority member of the confirming Senate committee.⁴⁷ Nothing deters the recruitment of senior people more than the fear that their private lives will be shredded by the leakage of such material to the national media.

To significantly revise current conflict-of-interest and ethics regulations, the President and Congressional leaders should meet quickly and instruct their top aides to make recommendations within 90 days of January 20, 2001. This Commission endorses retention of basic laws and regulations that prevent bribery and corrupt practices as well as the restrictions in the U.S. Code that ban former officials from lobbying their former agencies for one year. We also endorse lifetime prohibitions against acting as a representative of a foreign government and against making a formal appearance in reference to a “particular matter” in which he or she participated personally and substantially, or a matter under his or her official responsibilities. However, the Commission recommends two important actions:

⁴⁴ Ornstein and Donilon, p. 97. We also advocate accelerating the appointment process for the 80 key science and technology personnel in government. See Section II above, and *Science and Technology in the National Interest: The Presidential Appointments Process* (Washington, DC: National Academies of Science, June 30, 2000). The 80 positions of which we speak are listed on p. 8.

⁴⁵ Ornstein and Donilon, p. 94.

⁴⁶ *Ibid.*, p. 95.

⁴⁷ Former FBI (and CIA) Director William Webster has noted that these files are “often freighted with hearsay, rumor, innuendo, and unsubstantial allegations.” Quoted in *ibid.*, p. 95.

- *Conduct a comprehensive review of the regulations and statutory framework covering Presidential appointments to ensure that regulations do not exceed statutory requirements.*
- *Make blind trusts, discretionary waivers, and recusals more easily available as alternatives to complete divestiture of financial and business holdings of concern.*

The conflict of interest regime *should also be decriminalized*. Technical or inadvertent misstatements on complex disclosure forms, or innocent contacts with the private sector, should not be presumptively criminal. The Office of Government Ethics should be enabled and encouraged to enforce the disclosure and post-employment statutes as civil or administrative matters; to decide questions expeditiously; and to see its job as clearing the innocent, as well as pursuing wrongdoers.

These recommendations can be accomplished through Executive Branch action, such as that which rescinded Executive Order 12834. Other recommendations, however, will require Congressional concurrence and action. We therefore urge the new President to take the initiative immediately with Congress to agree on future statutory reforms.

C. THE FOREIGN SERVICE

An effective and motivated Foreign Service is critical to the success of the Commission’s restructuring proposal for the State Department [see Section III above]. Yet among career government systems, the Foreign Service, which is set apart from other civilian personnel systems by its specialized entrance procedures and up-or-out approach to promotion, is most in need of repair.

While some believe the Foreign Service has retained much of its historical allure and cachet, many close observers contend that the Foreign Service no longer attracts or retains the quality of people needed to meet the diplomatic challenges of the 21st century. Overall educational competence in areas crucial to a quality Foreign Service—including history, geography, economics, humanities, and foreign languages—is declining, resulting in a shrinking pool of those with the requisite knowledge and skills for this service.⁴⁸ The proposed revision to the National Security Education Act [recommendation 39 above] is one response to this deficit.

Data indicate that recruitment is currently the Foreign Service’s major concern.⁴⁹ There are now 25 percent fewer people taking the entrance exam as there were in the mid-1980s. Other careers, in corporations and non-governmental organizations, now offer many of the same opportunities on which the Foreign Service used to hold the monopoly: living overseas, learning foreign languages, and developing negotiating experience. These other opportunities generally pay better, do not entail the same

⁴⁸ According to the National Center for Education Statistics, 30 to 35 percent of students at three different grade levels performed below the “basic” level of civics knowledge. 38 percent at the 4th grade level, 41 percent at the 8th grade level, and 59 percent at the 12th grade level performed below the “basic” level of U.S. history knowledge. Roughly 30 percent of students at all grade levels performed below the “basic” level in geography.

⁴⁹ There are indications that retention may be a looming concern as well. According to data provided by the State Department, while most Foreign Service entering classes have shown attrition rates between 12 and 17 percent by the eighth year of service, two recent classes show figures at 23 and 32 percent. These indications are not conclusive but they are supported by two major studies on departmental talent management, one completed by McKinsey & Company for the department and the other by the Overseas Presence Advisory Panel. Both found that while qualified applicants valued faster advancement and greater autonomy, it is precisely those things, along with quality management and respect for their family situations, they found lacking once in the Foreign Service.

level of austerity and danger often faced by Foreign Service officers posted abroad, and do not impose the same constraints on two-career families.

Beyond this lack of flexibility, many of the State Department's own policies are detrimental to attracting and keeping the highest quality people. The recruiting process is exceedingly slow, often taking two years from written exam to the first day of work. At a time when potential officers have many other career choices they may elect, this is a fatal weakness.

The oral exam also works at odds with the goal of attracting those with the range of knowledge (foreign policy, economics, cultural studies) and skills (languages, leadership, technology) necessary to an effective Foreign Service. The exam's "blindfolding" policy, whereby the examiners who decide who enters the Service know nothing about an applicant's background, has the admirable goal of ensuring a level playing field. But it runs completely counter to common sense in selecting the most qualified applicants.

The lack of professional educational opportunities currently afforded Foreign Service officers is also a problem both for the quality of those who stay and as a reason for those who leave. While the Foreign Service certainly needs more training in languages and emerging global issues, recent studies find an additional problem involving the lack of effective management and leadership throughout the State Department.⁵⁰ We therefore recommend the following:

● 41: The President should order the overhauling of the Foreign Service system by revamping the examination process, dramatically improving the level of on-going professional education, and making leadership a core value of the State Department.

In order to revamp the exam process, *changes must be made to shorten the hiring process dramatically without compromising the competitiveness of the system.* The Commission is encouraged by the use of the shorter Alternative Examination Program (AEP) which allows applicants (now limited to current government employees) to advance to the oral examination on the basis of their professional experience. Contingent upon evaluation of its success, this program should be broadened and other innovative approaches encouraged. If the written exam is retained, it might be administered by computer, allowing applicants to sit for the test at different times throughout the year.

In addition, *the oral exam's blindfolding policy should end.* While we sympathize with the aim of fair consideration for all, and with the State Department's eagerness to avoid legal harassment, this approach seriously damages the effectiveness of the examination process. It omits consideration of the professional and other experiences candidates may bring to the Foreign Service. It also makes it impossible for examiners to counsel applicants on the appropriateness of their backgrounds to particular cones (political, economic, consular, public diplomacy, or administrative). There is no legal requirement for this practice.

A successful Foreign Service also requires officers who are consistently building new knowledge and skills. As we recommend below for the Civil Service, *the Commission endorses a 10-15 percent*

⁵⁰ The State-commissioned report by McKinsey & Company, *The War for Talent: Maintaining a Strong Talent Pool*, emphasized that for the State Department to sustain its talent base, it must improve talent management. The final report of the Overseas Presence Advisory Panel built on McKinsey's finding and highlighted that "private sector managers were almost twice as likely as public-sector managers to give high performers the best development opportunities and fast-track growth. More than 70 percent of the private-sector managers viewed motivating and attending to people as a prime priority, while less than 30 percent of State Department managers interviewed considered it a top priority." [Overseas Presence Advisory Panel, p. 52.]

increase in personnel to allow for that proportion of the overall service to be in training at any given point.⁵¹ Current State Department professional development, focused mostly on languages, must be greatly expanded to ensure a diplomatic corps on the cutting edge of 21st century policy and management skills. We agree with the recommendations of McKinsey and the Overseas Presence Advisory Panel that call for a full range of mandatory educational courses in functional topics, languages, leadership, and management. Training milestones should be met in advance of promotions or advancements to supervisory positions.

Beyond problems with the exam process and the lack of professional development programs, all levels of the State Department suffer from a lack of focus on leadership and management. Improvements will require a cultural shift that must flow from the top. We urge future Presidents and Secretaries of State in selecting senior State Department officials to consider management strengths and departmental leadership abilities in addition to substantive expertise. Our proposal for restructuring the State Department [recommendation 19] is also aimed at fostering better management skills.

At lower levels, too, the State Department must develop sound talent management practices. We endorse many of the McKinsey report's findings: allow leaders more discretion in making key talent decisions; reduce time-in-grade requirements to allow the best performers to advance more quickly; and improve feedback to allow managers to gain from insights provided both from above and below.

Most of these problems can be handled effectively by the State Department without additional legislative mandate; yet some of these changes, particularly promoting professional education, require Congress to appropriate additional funds. The Department of State estimates that it would cost \$200 million annually to create a 10-15 percent training float. The Commission endorses such an investment.

Additionally, the Commission believes we must restore the external reputation of those who serve our nation through diplomatic careers. As a means of achieving this, ***we recommend changing the Foreign Service's name to the U.S. Diplomatic Service.*** This rhetorical change will serve as a needed reminder that this group of people does not serve the interest of foreign states, but is a pillar of U.S. national security.

D. THE CIVIL SERVICE⁵²

While there is disagreement as to the extent of the crisis in Civil Service quality, there are clearly specific problems requiring substantial and immediate attention.⁵³ These include: the aging of the federal workforce; the institutional challenges of bringing new workers into government service; and critical gaps in recruiting and retaining information technology professionals and those with less-common language skills. Most striking is how many of these problems are self-inflicted to the extent that departmental authority already provides some remedy if only the institutional will and budgetary resources were also available. Fixing these problems will make a major contribution to improving recruitment and retention.

⁵¹ *Ibid.*, p. 55.

⁵² The Commission considers personnel from the Departments of State (excluding the Foreign Service), Defense, Commerce, Justice, and Treasury and members of the Intelligence Community to constitute the core national security members of the Civil Service. Members of the Intelligence Community are governed by separate personnel regulations and authorities.

⁵³ On the general question, compare the pessimistic study led by Paul Volcker [The National Commission on the Public Service, *Leadership for America: Rebuilding the Public Service* (Washington, DC: The National Commission on the Public Service, 1989)] with the more optimistic assessment of Joel D. Aberbach and Bert A. Rockman [*In the Web of Politics: Three Decades of the U.S. Federal Executive* (Washington, DC: Brookings Institution Press, 2000).]

A prominent problem confronting all of the Civil Service is its aging workforce. The post-World War II baby-boomer generation heeded President Kennedy's call to government service in unprecedented numbers, but the first of this age cohort will turn 55 in 2001. A retirement wave that will continue for the next eighteen years will reach crisis proportions in many departments. Nearly 60 percent of the entire civilian workforce is eligible for early or regular retirement today.⁵⁴ Within that overall figure, 27 percent of the career Senior Executive Service (SES) is eligible for regular retirement now; 70 percent will be eligible within five years.⁵⁵ This growing retirement wave is exacerbated by the small numbers of employees in their twenties and thirties in most agencies. When agencies such as the Department of Defense and those within the Intelligence Community chose to downsize through hiring freezes, they contributed to this trend.

While some have argued that the "Generation X" cohort is less inclined toward government employment, our analysis suggests that this cohort does see government as one of several desirable career tracks. If recruiting were resumed, many within this age group would seek federal jobs. This is suggested by the fact that the one current mechanism for bringing graduate students into government—the Presidential Management Internship program—has remained highly competitive.⁵⁶

Yet there are still two major problems in converting interest in government positions to actual service. First, many young adults have completed or are enrolled in graduate school, and thus carry a much heavier student loan burden than their predecessors. Our recommendations for expanding student loan forgiveness programs [recommendations 11 and 39] should help mitigate this problem.

Second, the length and complexity of most application and security clearance processes is devastating in an economy where private sector firms can make on-the-spot offers. In a survey of employees from the Departments of Commerce and the Treasury, fully 54 percent of Treasury respondents and 73 percent of Commerce respondents reported that it took at least four months to receive an offer from the time they submitted an application.⁵⁷ Departments must shorten the appointment and security clearance process.

Yet a third major problem for the civil service is the difficulty of attracting and retaining information technology (IT) professionals who are in great demand throughout the economy. To meet expected demand, the nation will need an additional 130,000 new IT workers each year through at least 2006. The federal government will also need more IT capability, requiring constant hiring to keep up with requirements. The strong demand for IT professionals in the private sector will insure a continuing pay gap between public and private opportunities, making it even more difficult for the government to attract needed talent. This is compounded by a growing "speed-to-seat metric"—a measure of the time taken to recruit, hire, and place an employee. It means that some government IT projects with compressed life-

⁵⁴ U.S. Office of Personnel Management, *The Fact Book: Federal Civilian Workforce Statistics* (Washington, DC: Office of Personnel Management, September 1999).

⁵⁵ U.S. Office of Personnel Management and Senior Executives Association, *Survey of Senior Executive Service* (Washington, DC: Office of Personnel Management, 1999); United States General Accounting Office, *Senior Executive Service: Retirement Trends Underscore the Importance of Succession Planning* (Washington, DC: General Accounting Office, May 2000), p. 2. This latter document offers startling figures for individual departments: 77 percent of those at the Department of Commerce, 74 percent of those at the Department of Defense, and 71 percent of those at the Department of the Treasury will be eligible for regular retirement by 2005 (p. 46).

⁵⁶ The Office of the Secretary of Defense has received between 100 and 140 applications each year since 1997 for six to eight open PMI positions. Data provided by the OSD, July 7, 2000.

⁵⁷ Booz-Allen & Hamilton, Inc., *Employee Recruitment and Retention Survey Results*, August 30, 2000, pp. 33.

cycles, including some too sensitive to contract out, may expire before a new hire can even start the project.⁵⁸

Beyond recruiting difficulties, the federal government faces significant IT retention challenges. Deficiencies in governmental occupational structures and position descriptions contribute to the loss of IT personnel to the private sector. Corporations can alter the role of IT personnel rapidly as technology advances, while government position structures are comparatively sluggish. As a result, IT position descriptions in the government often do not match those in the private sector.⁵⁹

These trends pose particular problems for the national security community. IT professionals are needed not only for crucial support functions but also to help run sophisticated intelligence platforms. Lengthy security clearance processes and less competitive compensation packages make recruiting high-quality IT personnel for these purposes very difficult. There are also retention problems as younger IT civil servants are lured away by the private sector. The National Security Agency (NSA) reports growing attrition rates particularly among young professionals, the group most skilled in new technologies and most in demand.⁶⁰

There is a corresponding problem, though of lesser magnitude, for less common (“low density”) languages. The United States faces a broader range of national security challenges in the post-Cold War world, requiring policy analysts and intelligence personnel with expertise in more countries, regions, and issues. The people most likely to bring these skills are native speakers of other languages with direct cultural experiences; yet members of this group often face the greatest difficulties in getting a security clearance. We therefore recommend the following:

● 42: The President should order the elimination of recruitment hurdles for the Civil Service, ensure a faster and easier hiring process, and see to it that strengthened professional education and retention programs are worthy of full funding by Congress.

The federal government must *significantly increase recruiting programs* through programs like the National Security Education Act [recommendation 39], which will link educational benefits to a service requirement. To anticipate the coming wave of retirements, the government needs to adopt a range of policies that make hiring and promotion practices more flexible.

Some progress has been made, particularly in the IT field, in shortening the length of the hiring process. This is crucial to improving government competitiveness. Organizations like the Central Intelligence Agency (for its non-clandestine employees) have authorized recruiters to negotiate on-the-spot offers—including compensation packages—contingent upon successful completion of background investigation and polygraph requirements. These programs should be generalized throughout the national security community, not least for critical science and technology personnel.

The *security clearance process itself must be revamped* to provide for more efficient and timely processing of applications. There are several ways to go about this. One is to re-code intelligence community positions to allow some employees to start work before receiving the most sensitive security clearances. A bipartisan Executive-Legislative commission could be helpful in examining other methods of streamlining the security clearance process, while maintaining the rigor required for national security positions.

⁵⁸ CIO Council, *Meeting the Federal IT Workforce Challenge* (Washington, DC: CIO Council, June 1999), p. 15.

⁵⁹ *Ibid.*, p. 11.

⁶⁰ Evidence provided by the National Security Agency.

The U.S. Office of Personnel Management (OPM) and individual agency personnel offices have designed many incentive programs to recruit and retain quality employees.⁶¹ But many departments and agencies have not used these programs for lack of funds. Because all incentive programs are drawn from the same pool of money as that for salaries, administrators must trade off incentives for some employees against the ability to hire additional personnel. *Additional funds must be provided to maximize agencies' options in recruiting and retaining high-quality personnel.*

Similarly, existing authorities provide funds for professional education. Such opportunities are crucial in maintaining a knowledgeable cadre of national security professionals. Supporting employees' desire for professional development is also a means of ensuring retention. Yet the degree of downsizing in national security agencies has yielded a system whereby the workload of an employee on training must be split among others in the office, creating a powerful disincentive for managers to allow their best employees to pursue these opportunities. As a complement to proposals made for the Foreign Service, *the Commission would apply the recommendation of the U.S. Overseas Presence Panel to all national security departments and agencies:* that "the workforce structure and resources available for staff *should take into account the 10-15 percent of employees who will be in training. . . at any given time.*"⁶² Thus "full staffing" of a department or agency should be defined as a number ten to fifteen percent greater than the number of available positions.

We also need to give special priority to measures to secure and retain information technology (IT) talent in the most mission-critical areas while finding ways to outsource support functions.

For the mission-critical areas, this means *using existing and seeking additional authorities to allow direct-hiring and to provide for more market-based compensation.* While the government cannot completely close the pay gap with the private sector, higher salaries, signing bonuses, and performance rewards can narrow it. Some agencies have begun this effort by paying senior IT professionals market-based salaries.⁶³

Further, the Commission endorses the recommendation of the CIO Council, a group of departmental and agency Chief Information Officers, to use and expand existing OPM authorities to lift pay cap restrictions on former Civil Service and military employees.⁶⁴ For entry-level talent, we recommend expanding the newly authorized Cyber Corps, akin to the Reserve Officer Training Corps (ROTC) program, whereby the government would pay for two years of a student's schooling in exchange for two years of governmental IT service.

⁶¹ Examples include recruitment and retention bonuses, the use of special pay scales for specific types of professionals, and pay banding whereby agencies would have greater flexibility in allocating personnel funds among employees of different quality and skills. New regulations currently under review at OPM would allow departments to repay federally funded student loans by \$6,000 a year up to a maximum of \$40,000. See "Proposed Rules—Repayment of Student Loans."

⁶² Overseas Presence Advisory Panel, p. 55.

⁶³ The Director of Central Intelligence (DCI) currently has the authority and funding to conduct a five-year pilot program through which he can hire up to 39 technical specialists in critical functions and pay them on the basis of market standards rather than on the federal pay scale. The Federal Bureau of Investigation has a similar program.

⁶⁴ CIO Council, p. 13. On the CIO Council, see note 14 in Section I.

Efforts to retain young IT professionals should recognize that their career plans will likely not include a 30-year or even a ten-year stint in government service. OPM developed departmental flexibility for Y2K programs, including temporary appointments (one to four years) within the competitive service.⁶⁵ We believe such authorities should be instituted and expanded for IT professionals. In its own interest, the government needs to maximize the ease with which transitions can be made between government service and the private sector. Young employees' interest in staying may be prolonged through performance-based retention bonuses and through the establishment of a unique and adaptive career path for IT professionals that includes rotational assignments and better opportunities for education and responsibility. Such an effort might also permit the government to move IT capabilities more fluidly across departments and agencies.

Where appropriate, *outsourcing IT support functions is still needed*. NSA has already turned development and management of non-classified technology over to a private-sector contractor, allowing NSA to focus its in-house IT talent on developing and overseeing core intelligence technologies. More programs like this can be used to supplement the other steps outlined here.

The implementation of these proposals for the civil service will require a multifaceted approach. We believe the endorsement of these recommendations by the President would set a proper tone of importance and urgency. Because many recommendations will affect many departments, *an interagency coordinating group should be convened to help OPM develop new provisions*. From there, heads of departments and agencies can take steps to implement them. We know that some recommendations, such as improving the recruitment and retention of IT professionals, cannot be fully implemented in the near term. In such cases, we urge departments to set timelines for reaching goals and, for those issues that cross agency lines such as IT needs, departments and agencies should work collaboratively.

These recommendations also presuppose greater Congressional appropriations devoted to making these changes possible. The preceding analysis demonstrates that, in order to allow for critical professional education, agency end-strengths must be increased by 10-15 percent, requiring *a significant increase in personnel funding*.

Beyond training, an aggressive recruitment campaign will require additional funds as well. In proposing the information technology "cyber corps" program, the Clinton Administration requested \$25 million annually to pay for two years of college for 300 students. IT positions that pay close to market rates will have considerably higher salaries than is currently the case; however, this group would be relatively small. Finally, IT outsourcing proposals are likely to save the government money on a net basis since the cost of contracted labor is less than that of paying civil servant salaries, benefits, and retirement contributions.⁶⁶

The national security component of the Civil Service is faced with an additional problem: the need to develop professionals with breadth of experience in the interagency process, and with depth of knowledge about substantive policy issues. Both elements are crucial to ensuring the highest quality policy formulation and analysis for the United States across a range of issues. They are also key to maintaining a robust national security workforce as professionals seek a diversity of experiences along their career paths.

⁶⁵ *Ibid.*, p. 15.

⁶⁶ Recent NSA outsourcing is estimated to save the government \$1 billion over the ten-year life of the contract.

The Commission’s Phase II report argued that “traditional national security agencies (State, Defense, CIA, NSC staff) will need to work together in new ways, and economic agencies (Treasury, Commerce, U.S. Trade Representative) will need to work closely with the national security community.”⁶⁷ Better integration of these agencies in policy development and execution requires a human resource strategy that achieves the following objectives: expanded opportunities to gain expertise and to experience the culture of more than one department or agency; an assignment and promotion system that rewards those who seek broad-based, integrative approaches to problem solving instead of those focused on departmental turf protection; and the erasure of artificial barriers among departments.

The current Civil Service personnel system does not achieve these objectives because career civilians in the national security field rarely serve outside their parent department.⁶⁸ We therefore recommend the following:

- **43: The Executive Branch should establish a National Security Service Corps (NSSC) to enhance civilian career paths, and to provide a corps of policy experts with broad-based experience throughout the Executive Branch.**

Such a National Security Service Corps would broaden the experience base of senior departmental managers and develop leaders skilled at producing integrative solutions to U.S. national security policy problems.

Participating departments would include Defense, State, Treasury, Commerce, Justice, Energy, and the new National Homeland Security Agency—the departments essential to interagency policymaking on key national security issues. Members of the NSSC would not hold every position within these departments. Rather, each department would designate Corps positions. Members of the participating departments could choose to stay in positions outside the NSSC without career penalty. They would continue to be governed by the current Civil Service system.

In order to preserve the firewall that exists between intelligence support to policy and policymaking, intelligence community personnel would not be part of the NSSC. A limited number of rotational spots, however, should be held in selected interagency intelligence community centers (such as the Non-Proliferation Center and the Counter-Terrorism Center) to allow members of the Corps to understand better intelligence processes and products.

While the Foreign Service will remain separate from the NSSC, an organic relationship between the Foreign Service and the NSSC needs to exist. Members of the Corps would be eligible to compete for all policy positions at the Department of State’s headquarters while Foreign Service officers would be able to compete for NSSC positions in all the participating departments. In addition, NSSC personnel could fill select positions in some overseas embassies and at military unified commands. Over time, the difference between the Foreign Service and the NSSC could blur.

A rotational system and robust professional education programs would characterize the NSSC. In designating positions for Corps members, departments will need to identify basic requirements in education and experience. Rotations to other departments and interagency professional education would

⁶⁷ *Seeking A National Strategy*, p. 14.

⁶⁸ For example, a recent OPM survey of SES personnel indicates that only nine percent of those surveyed have changed jobs to work in another agency since becoming an SES member, despite the fact that 45 percent said that mobility would improve job performance. See U.S. Office of Personnel Management and Senior Executives Association, pp. 27-8.

be required in order to hold certain positions or to be promoted to certain levels.⁶⁹ Of course, a limited number of waivers could be granted to allow departments to fill particular gaps as necessary.

While the participating departments would still retain control over their personnel and would continue to make promotion decisions, an interagency advisory group will be key to the NSSC's success. This group would ensure that promotion rates for those within the NSSC were at least comparable to those elsewhere in the Civil Service. They would help establish the guidelines for rotational assignments needed for a Corps member to hold a given position and for the means of meeting the members' educational requirements. Such guidance and oversight will help ensure that there are compelling incentives for professionals to join the NSSC. For this type of interagency program to be successful, employees must see it as being in their own best interest to meet these new requirements.

The Commission believes such a Corps can be established largely through existing departmental authorities and through new regulations from OPM. Specific legislative authority is not necessary.

E. MILITARY PERSONNEL

Today the military is having even greater difficulty recruiting quality people than the civilian sector of the government. Despite significant post-Cold War force reductions in recruiting goals, the Services have missed their quotas in some recent years.⁷⁰ Moreover, recruiting costs have risen by nearly one-third over the last four years, while DoD quality indicators of those enlisting have declined by 40 percent.⁷¹ Some Services, struggling to fill ROTC programs with officer candidates, will continue to fall short for the next three years despite a much larger college population and reduced quotas for officer accessions.⁷²

Even more ominous are the problems in *retaining* quality personnel. Increased operational commitments are being carried out by a smaller number of military forces, which—along with aging equipment, stringent budgets, depleted family benefits, healthcare deficiencies, and spousal dissatisfaction—has engendered an atmosphere of widespread frustration throughout military ranks.⁷³ Job

⁶⁹ For example, departments might designate that personnel must hold one assignment outside his or her parent department in order to become a member of the SES and another such assignment to be promoted to SES-4. [SES pay scales are numbered one through six. An additional rotation is suggested for promotion to SES-4 because this is the pay grade at which many SES members serve during their final tours, when they generally have the highest level of responsibility for interagency activities.]

⁷⁰ Data provided by the Office of the Secretary of Defense, showing both active and reserve recruiting results, July 2000. See also William S. Cohen, *Annual Report to the President and the Congress* (Washington DC: Department of Defense, 2000), chapter 4.

⁷¹ Statement of the Honorable Rudy De Leon, Under Secretary of Defense (Personnel and Readiness) before the Military Personnel Subcommittee of the Armed Service Committee, "Sustaining the All-Volunteer Force: Military Recruiting and Retention," March 8, 2000.

⁷² Department of Defense, *Quarterly Readiness Report to Congress*, January-March 2000.

⁷³ Some numbers illustrate the problem. The Navy is nine hundred pilots short of necessary levels, while the Air Force reported the largest peacetime pilot shortage in its history (1,200 pilots short of operational requirements). The Air Force pilot loss rate is projected to double by 2002 [William Taylor, S. Craig Moore, and C. Robert Roll, Jr., *The Air Force Pilot Shortage: A Crisis for Operational Units?* (Washington, DC: RAND, 2000, pp. iii and 1). Over the past ten years, the Army has experienced a 58 percent increase in the percentage of Captains voluntarily leaving the military before promotion to Major [Information Paper TAPC-ARI-PS, October 22, 1999]. High-quality junior officers are also leaving military service earlier. In 1987, 38 percent of the Army's West Point graduates left military service before ten years of active duty—the best retention rate among all Army commissioning sources. In 1999, 68

satisfaction has declined significantly, and increasing numbers of quality people are leaving military service well in advance of retirement, or, in other cases, are retiring as soon as they are eligible.⁷⁴ Moreover, data indicate that it is not just the junior officers who are leaving; retention of senior non-commissioned officers (NCOs) has declined as well.⁷⁵

The Commission believes retention in the Services is a growing problem in part because the triple systems of “up-or-out” promotion, retirement, and compensation do not fit contemporary realities. The Defense Officer Personnel Management Act (DOPMA) of 1980⁷⁶ mandates retirement at a specific time in an officer’s career depending on rank,⁷⁷ or, in many cases, separation before retirement in cases of non-promotion up until the grade of O-4. This system itself stems, in part, from a 1947 assumption of a virtually unlimited pool of manpower geared for total war mobilization. The current environment, however, is very different. The supply of incoming personnel is limited and the skills required more specialized. Moreover, older people are not “unfit” for many of today’s critical military tasks, and the country cannot afford to squander the investment in training and experience that military professionals possess. The military services do not need to retain everyone, but they do need most of all to retain superior talent for longer periods.

Without decentralizing the career management systems, introducing new compensation incentives, and providing an array of institutional rewards for military service, the Commission believes that the United States will be unable to recruit and retain the technical and educated professionals it needs to meet 21st century military challenges.

These problems call for four sets of changes. First, the enhancement of the professional military must proceed hand in hand with the reinvigoration of the citizen soldier. Indeed, confronting many threats to our national security, including those to the American homeland, will necessarily rely heavily on reserve military components, as we have specified above in Section I, recommendation 6 in particular.

Second, we must change the ways we recruit military personnel. This means putting greater effort into seeking out youth on college campuses and providing grants and scholarships for promising

percent of West Point graduates left before the ten-year point, the lowest retention rate among all Army commissioning sources. [DMDC West DoD Officer Retention Data, July 2000, verified by Army Personnel Branch, July 2000]. High-quality Lieutenant Colonels/Colonels and their Navy equivalents (O-5s and O-6s who have had Department/Battalion/Squadron/Ship-level commands in their careers) are leaving early, as well. The Navy reports that both post-department officers and post-squadron Commanders are separating at a rate *three times higher* than a decade ago.

⁷⁴ See “Spring 1999 Sample Survey of Military Personnel: Career Intent,” U.S. Army Research Institute for the Behavioral and Social Sciences Survey Report, October 1999.

⁷⁵ Garnered from ten-year point junior officer retention data provided by Defense Manpower Data Center to USCNS/21, July 2000.

⁷⁶ DOPMA Public Law 96-513.

⁷⁷ Those Majors/Lieutenant Commanders not selected for promotion must normally retire at twenty years; Lieutenant Colonels and Navy Commanders must retire at 28 years if not selected for promotion to Colonel/Captain; Colonels, and Navy Captains have until the 30-years point to make promotion to flag officer rank before mandatory retirement; and most flag officers that remain in grade have a 35-year limit of commissioned service. It should be noted that most Colonels/Navy Captains know by the time of their promotion to O-6 whether they have a chance at further promotion. Most do not, and the incentives currently in place encourage those officers to retire at the earliest possible time. The result is a significant talent drain of officers who, under the current system, could have served at least five or six additional years.

candidates. The military must also innovate in such areas as rapid promotion, atypical career paths and patterns, and flexible compensation to attract and retain talented candidates. The Services must also offer a greater variety of enlistment options, including short enlistments designed to appeal to college youth, and far more attractive educational inducements.⁷⁸ This may include scholarships, college debt deferral and relief, and significantly enhanced GI Bill rewards in exchange for military service.

Third, we must change the promotion system. Promotion has been, and remains, a primary way to reward performance. But the rigidity of the promotion system often has the effect of either taking those with technical specialties away from the job for which they are most valuable, or failing to provide timely and sufficient incentives for quality personnel to stay in military service. In the Commission's view, the promotion system needs to be more flexible. Current law states that promotion rates must comply with Congressionally-mandated grade tables, which specify the number of personnel permitted in each grade by Service.⁷⁹ This denies needed flexibility. Moreover, promotion should be only one of many rewards for military service. The Services need the flexibility, beyond new forms of fair and competitive compensation, to provide institutional benefits, including more flexible assignments, incentive retirement options, advanced education, alternative career paths, negotiable leaves of absence, and rewards for career-broadening experiences.

The fourth set of changes must address the military retirement system, which is centered on a twenty-year career path. If one serves fewer than twenty years or fails promotion to minimum grades, no retirement benefits are forthcoming either for officers or those in the enlisted ranks.⁸⁰ In this "all-or-nothing" system, junior personnel have to commit themselves to a long-duration career. For those who make a twenty-year career choice, the system induces them to leave the military in their early forties.⁸¹ In other words, the current system either requires separation at mandatory points for each grade, or actively entices all personnel who do make it to twenty years of service to leave at or just beyond that point.⁸²

Talented people in uniform, generally in their early forties, thus confront a choice between working essentially at "half pay," or beginning a second career at a time when they are generally most marketable.⁸³ To those with particularly marketable skills (e.g., pilots, information technology professionals, and medical personnel), the inducements to leave often prove irresistible. But such cases are only the most visible portion of a widespread problem that induces high performers of every description to abandon the military profession. Thus the armed services lose enormous investments in training, education, and experience at the very moment that many mid-grade officers and mid-grade and senior NCOs are poised to make their most valuable contributions.

We urge the President and the Congress to give the Services the flexibility to adapt and dramatically reshape their personnel systems to meet 21st century mission needs. The 1947/1954/1980

⁷⁸ Charles Moskos, *Military Recruitment Survey, Northwestern University Students*, report prepared for the Commission, March 2000.

⁷⁹ See DOPMA Public Law 96-513 §3202, 8202, 5444, 5442.

⁸⁰ Military Retirement Act of 1986 (Public Law 99-348). This authorizes military benefits for personnel after twenty years of service at 40 percent of their five years' highest basic pay. Effective October 1, 1999, the Military Retirement Act of 1986 (REDUX), U.S. Code, Title 10, §1409(b), was repealed by the National Defense Authorization Act 1999 (Public Law 106-65; U.S. Code, Title 10, §1409 (b) which restored to the military service members who entered military service after July 31, 1986, 50 percent of the highest three years average basic pay for twenty years of active duty service, rather than 40 percent under REDUX. Also, it provided for full cost of living adjustments (COLAs) rather than the Consumer Price Index (CPI) minus one percentage point under REDUX.

⁸¹ There is 2.5 percent increase in the retirement percentage of base pay for each year of service past twenty years, which stops at 30 years. In addition, 26 years of service is where the last bi-yearly longevity salary increase occurs.

⁸² DOPMA Public Law 96-513, §633 requires that Lt. Colonels and Navy Commanders who are not listed for promotion to the next higher grade be retired upon completion of 28 years of active commissioned service.

⁸³ Half-pay is a term of art referring to the fact that after twenty years' service, a soldier is entitled to 50 percent of pay upon retirement. Since a soldier would get half pay even if he were not still in service, staying in service can be characterized as working for the other 50 percent—hence the phrase "working for half pay."

legislation⁸⁴ that defines military career management, coupled with legislation that governs military retirement and compensation, gives the Services too little authority to modernize and adapt their personnel systems at a time of accelerating change.⁸⁵ Mandatory promotion rates, officer grade limitations for each Service, required separation points under “up-or-out,” rigid compensation levels, special pay restrictions and retirement limits, collectively bind the Services to the point of immobility. Similar restrictions and disincentives apply to enlisted careers and particularly affect senior NCOs and technical specialists.

Earlier in this section we strongly recommended a major expansion of the National Security Education Act (NSEA), as well as the creation of the National Security Science and Technology Education Act (NSSTEA), to provide significantly better incentives for quality personnel to serve in government—civil and military. The Commission believes that these Acts are especially relevant to the recruitment of high-caliber military personnel. In particular, programs offering either college scholarships or college loan repayments in exchange for service after graduation will make uniformed service more attractive to all segments of the population.

In addition to the enactment of an expanded NSEA and the creation of a NSSTEA, we propose the following complement:

● 44: Congress should significantly enhance the Montgomery GI Bill, as well as strengthen recently passed and pending legislation supporting benefits—including transition, medical, and homeownership—for qualified veterans.

The current version of the Montgomery GI Bill (hereafter GI Bill) is an educational program in which individuals first perform military service and then are eligible for educational benefits. While in military service, participants must authorize deductions from their salaries, to which the government then adds its contribution.⁸⁶ To receive benefits while still in service, service men and women must remain on active duty for the length of their enlistment. To receive benefits after service, one must receive an honorable discharge. The GI Bill is both a strong recruitment tool and, more importantly, a valuable institutional reward for service to the nation in uniform.

Another important source of reward for military service is Title 38, which provides a range of veterans’ benefits including medical and dental care, transition training, and authorization for Veterans Administration (VA) homeownership loans. Collectively, VA benefits are an institutional reward for honorable military service and integral to the covenant between those who serve in the military and the nation itself. Given the historical value, relevance, and proven utility of these programs, we recommend restoration and enhancements to them as a way of rewarding and honoring military service.

GI Bill entitlements should equal, at the very least, the median education costs of four-year U.S. colleges, and should be indexed to keep pace with increases in those costs.⁸⁷ Such a step would have the

⁸⁴ See Bernard Rostker, Harry Thie, James L. Lacy, Jennifer H. Kawata, and S.W. Purnell, *The Defense Officer Personnel Management Act of 1980: A Retrospective* (Santa Monica, CA: RAND, 1993).

⁸⁵ Defense Science Board, p. 79

⁸⁶ The program is administered by the Veterans Administration, under agreements with the Secretary of Defense and the Secretary of Transportation, who submit an annual request to Congress detailing the necessary appropriations. Funds are transferred to the Veterans Administration from the Department of Defense Education Benefits Fund administered by the Treasury Department, or from appropriations made to the Department of Transportation in the case of the Coast Guard.

⁸⁷ See Veterans Administration web site October 2000, Summary of Educational Benefits under the Montgomery GI Bill Active Duty Educational Assistance Program, Chapter 30 of Title 38 U.S. Code and Selected Reserve Educational Assistance Program Chapter 1606 of Title 10 U.S. Code. Active duty servicemen and women can elect a

additional social utility of seeding veterans among the youth at elite colleges. The Bill should accelerate full-term payments to recipients, extend eligibility from ten to twenty years, and support technical training alternatives. The GI Bill's structure should be an institutional entitlement that does not require payments or cost-sharing from Service members. It should allow transferability of benefits to qualified dependents of those Service members who serve more than fifteen years on active duty. In addition, it should carry a sliding scale providing automatic full benefits for Reserve and National Guard personnel who are called to active duty for overseas contingency operations.

We also believe that funding for these GI Bill institutional entitlements is not sufficient and should be separated within the defense budget to give the department more flexibility.⁸⁸ Additionally, Title 38, should be modified to reinforce medical, transition, and VA homeownership benefits for career and retired service members. We support recently proposed legislation on this and other veterans benefits, but believe that additional measures are still needed.

Taken together, such changes would fulfill the nation's promise of real educational opportunities and place greater value on the service of military personnel. In addition, those in uniform are likely to serve longer to secure these greater benefits.

The laws that make military personnel systems rigid and overly centralized must be altered to provide the required flexibility to meet 21st century challenges. The Commission recommends the following:

- **45: Congress and the Defense Department should cooperate to decentralize military personnel legislation dictating the terms of enlistment/comm issioning, career managem ent, retirem ent, and compensation.**

Specifically, revised legislation should include the following acts:

- **1980 DEFENSE OFFICER PERSONNEL MANAGEMENT ACT (DOPMA):** Provide Service Secretaries increased authority to selectively exempt personnel from “up-or out” career paths, mandatory flight assignment gates, the double pass-over rule,⁸⁹ mandatory promotion and officer/enlisted grade sizes, the mandatory retirement “flowpoints” by grade, and active duty service limits. The individual Services should be funded to test alternative career and enlistment paths that are fully complemented by modified compensation, promotion, and retirement/separation packages.

\$100/month reduction in pay for twelve months in exchange for up to 36 months of educational entitlements. The maximum entitlement rate is \$552 per month. However, servicemen do not necessarily receive the full \$552. Monthly rates are calculated according to the cost of tuition. Recipients are entitled to a full 36 months of benefits, not the compounded total of \$552 for 36 months. Reservists do not contribute \$100 per month, but receive a maximum of only \$263 per month. Bill S1402, currently pending Presidential approval, would increase the Active Duty Rate to \$650 per month in educational entitlements. In the event of death, the \$1,200 reduction in pay is refunded, but benefits are non-transferable.

⁸⁸ The College Board, *Trends in College Pricing 2000*. The College Board report indicates 2000-01 annual costs for a commuter student at a public four-year institution is \$9,229 and \$7,024 for a two-year institution. This far exceeds the current maximum GI Bill entitlement of \$552 per month for active duty members.

⁸⁹ The double pass over rule refers to officers who have been in the primary zone for promotion to the next higher grade but who have been passed over for promotion for two consecutive years. Once such officers are passed over twice, they become subject to DOPMAs mandatory “up-or-out” exit flowpoints.

- 1999 NATIONAL DEFENSE AUTHORIZATION ACT: Permit testing of a conversion of the defined benefit systems to a partial defined contribution system, as well as early vesting schedules and other progressive alternatives to the current military retirement system. Allow the Services to shape modified retirement plans to complement alternative career paths and specialty service.
- U.S. CODE TITLE 37 (Compensation): Correct immediately the pay compression of senior NCOs in all the Services and test merit pay systems and alternative pay schedules based on experience, performance, and seniority.⁹⁰ Allow Service Secretaries discretion concerning continued flight pay for pilots undergoing non-flying career-broadening billets by modifying the 1974 Aviation Career Incentive Act.
- SYSTEM INTEGRATION: Reconcile a new DOPMA system (active duty) with ROPMA (Reserves), with the Technician Act (1968), the Guard AGR Act (National Guard), and with Civil Service personnel systems to facilitate and encourage increased movement among branches.

This Commission understands that implementing these recommendations will take time and require the support of the President, Congress, senior military officers, and Defense Department civilian leadership. We urge the creation of an Executive-Legislative working group that would set guidelines for service-centered trial programs. The working group should also evaluate new forms of enlistment options, selective performance pay, new career patterns, modified retirements for extended careers, and other initiatives that may support the Services. The group should undertake to estimate the projected costs as well as assess any unintended consequences that may result. At the same time, the Congressional Budget Office should further define and detail the costs of our proposed enhancements to the GI Bill and other veterans' benefits.

These recommendations will cost money. Treating the GI Bill's benefits as an entitlement, indexing tuition allotments with rising education costs, extending benefits to dependents, and enhancing veteran benefits to include medical, dental, and homeownership benefits will incur substantial costs. But we believe that the cost of inaction would be far more profound. If we do not change the present system, the United States will have to spend increasingly more money for increasingly lower-quality personnel.

Moreover, balanced against the initial costs of an enhanced National Security Education Act and a National Security Science and Technology Education Act would be long-term gains in recruiting and retaining quality personnel that would more than offset these costs. A 1986 Congressional Research Service study indicated that the country recouped between \$5.00 and \$12.50 for every dollar invested in the original GI Bill enacted after World War II.⁹¹ We believe this would also be the case under our proposed legislation. Moreover, there will be significant budgetary savings associated with reducing high first-term attrition, as well as with improving the retention of both mid-level enlisted personnel and junior officers, particularly in technical specialties.⁹²

⁹⁰ In 1964 senior enlisted leader (E-8s) pay was by comparison to junior enlisted (E-2's) pay a 7:1 ratio. With the pay increases associated with the All-Volunteer Force, the ratio of senior to junior enlisted pay is currently 3:1. In other words, in relation to the junior personnel they supervise, senior enlisted service members are paid significantly less than senior NCOs were in the draft military. In addition, the advent of large enlistment and reenlistment bonuses for junior enlisted personnel means that ratio of senior to junior enlisted pay has compressed even further.

⁹¹ This resulted from increased taxes paid by veterans who achieved higher incomes made possible by college education.

⁹² About one-third of all recruits do not complete their initial military obligation.

In sum, the Commission recommends major personnel policy reforms for both the civilian and the military domains. For the former, we emphasize the urgent need to revamp the Presidential appointment process for senior leadership, to attract talented younger cohorts to government service, to fix the Foreign Service, and to establish a National Security Service Corps that strengthens the government's ability to integrate the increasingly interconnected facets of national security policy. With respect to military personnel, our recommendations point to increasing the attractiveness of government service to high-quality youth, providing enhanced rewards for that service, and modernizing military career management, retirement, and compensation systems. Each of this Commission's recommendations in the area of the human requirements for national security aims to *expand* the pool of quality individuals, to *decrease* early attrition, and to *increase* retention.

The need is critical, but these reforms will go along way to avert or ameliorate the crisis. In a bipartisan spirit, we call upon the President and Congress to confront the challenge. Let it be their legacy that they stepped up to this challenge and rebuilt the foundation of the nation's long-term security.