SUBJECT: MANAGING LARGE-SCALE PRESIDENTIAL INITIATIVES

FROM: DWIGHT INK, JOHN KAMENSKY, and HARRY LAMBRIGHT

Every President will likely face the need to get large-scale initiatives done sometime during his term of office. "Large-scale initiatives" refers to challenges that reach across agency and program boundaries, oftentimes involving states, localities, citizens, businesses, and the non-profit sector. Recent examples include the implementation of the Recovery Act, initiating large-scale management reforms across the government, or undertaking big science projects such as the Human Genome Project.

The governance framework for such initiatives will differ depending on whether the big initiative is thrust upon the President, such as a large-scale economic or natural emergency, or whether it is self-initiated, such as the interstate highway construction project, or whether it is a large-scale, long-term science or technology initiative. Oftentimes, the framework was developed in an ad hoc manner, since the initiatives were seen as unique.

However, by looking back at previous large-scale initiatives, there are common success characteristics that should be incorporated into any future initiatives. For example:

- A seasoned senior executive was put in charge to lead the effort, with a simple organizational structure, and streamlined operations.
- There was a shared clarity around mission, goals, and objectives among key stakeholders.
- There was a core team of innovative federal employees who are comfortable with change and whose main job was focused on transformation.
- There was cross-agency and cross-sector collaboration around common outcomes.
- There was a sense of urgency that promotes rapid resolution of day-to-day issues.
- The initiative provided an unusually high level of transparency during implementation.
- There was freedom to innovate and deviate from existing administrative rules if necessary.

The memos that follow offer several recommendations to the President and Congress on ways to incorporate these characteristics into the way government approaches large-scale initiatives in the future, to ensure greater chances of success. These include the President using existing new authority to manage large-scale initiatives as well as Congress providing new authorities and working in new ways with the executive branch.

Memo #1: Managing Large-Scale, Time-Urgent Presidential Initiatives (by Dwight Ink)

Abstract: Presidents will invariably face a large-scale unanticipated event that is time urgent. This could be a natural disaster, a pandemic, or an economic crisis. In the past, these have largely been treated as unique, non-recurring events. But a review of such events over the past 60 years has identified common attributes of success. The key ingredients of success seem to be the individual chosen to lead the effort, a simple organizational structure, and streamlined operations that he or she uses to operate within. We recommend the President and Congress put in place several capacities in advance that will increase the chances of success when the nation faces its next large-scale, time-urgent event.

Much of the public image of the federal government is that of a ponderous entity that lacks the capacity to respond nimbly or economically to major challenges. Not surprising, in view of our failure to handle the Katrina recovery, prevent the failure of our early attempts to help stabilize Iraq after our successful military operations, or our continuing failure to deal with the mounting debt and fiscal crisis. Yet, in a globalized and increasingly competitive world, major challenges cutting across departmental lines are increasing in magnitude and urgency.

Three Cases of Successfully Managed Large-Scale, Urgent Presidential Initiatives

Fortunately, failures such as those just mentioned are not difficult to avoid if we will profit from those cases in which we have found ways to overcome the typical obstacles to action. Three cases under very difficult circumstances illustrate how we can handle complex undertakings if we manage them properly.

Recovering from the 1964 Alaskan Earthquake. In 1964, the second most severe earthquake ever recorded devastated the portion of Alaska where most of the people lived. The surface shifted both vertically and horizontally over 55,000 square miles, making rebuilding the infrastructure above and below ground very challenging, and the short Alaskan construction season made the speed of recovery urgent. President Lyndon Johnson designated career executive Dwight Ink to lead the recovery effort. Working from the White House, he involved every significant federal agency. No Alaskan engineer believed the relocation, design, and construction of public facilities such as water and sewer systems, or the rebuilding of the fishing harbors on which the state economy rested, could be accomplished in the short construction season. Yet through innovative policies established by a cabinet-level commission and innovative project management administered by experienced career managers, the construction required to enable people to remain in Alaska was completed in record time.

Fixing the Y2K Computer Bug. Near the end of the 20th century, it became clear that a software coding decision made in the early years of the computer could prevent computers across the nation to move into the 21st century. President Clinton called upon an experienced manager, John Koskinen, to manage the transition. Many said it was too late, and the task too complicated to succeed, predicting horrendous consequences in both government and business operations. With the support of the President and OMB, Koskinen quickly organized the most massive interagency and intergovernmental coalition, together with businesses here and abroad. Rather than establishing a large organization with

numerous procedures, he created a small staff and worked out of the White House. He relied on existing agency personnel and streamlined procurement and other administrative systems so that he could move rapidly. Instead of the chaotic morass of confusion widely predicted, Koskinen skillfully mobilized the resources of all these organizations in achieving a remarkable success.

Implementation of the 2009 Recovery Act. The American Recovery and Reinvestment Act of 2009 involved the allocation of roughly $800 billion – roughly equivalent to the size of the prior year's domestic spending. This legislation included a mix of tax cuts, grants to state and local governments, and new federal programs. These covered a wide range of policy areas, including healthcare, science, transportation, and energy. Everyone involved in this complex effort was under enormous pressure to move the funds very rapidly to help stem the rising rate of unemployment. At the same time, Congress had required an extra dimension of external oversight that was not always conducive to rapid action. Prospects for confusion, bottlenecks, and scandals were believed to be high. The President designated Ed DeSeve, an experienced federal manager, to lead the effort. He was given a small staff and an office in the White House to organize a series of "managed networks" of stakeholders. These interagency, and intergovernmental, networks shared best practices, resolved misunderstandings, and created trust among a wide range of stakeholders.

Each of these three undertakings was regarded by many as impossible challenges. Each faced unprecedented levels of urgency, yet had no road map to follow. Each involved many, if not all, of the federal agencies, plus state and local governments and the private sector that had to work together. Each occurred under different Presidents and political environments that spanned a half century. Yet there were common attributes that were key to the success of these initiatives and are worth looking at for adaptation for future large undertakings.

Common Attributes of Successful Large-Scale Urgent Initiatives

Following are seven attributes that seemed to be present in most of the successful large-scale urgent Presidential initiatives over the past 60 years. These include:

Attribute 1: Experienced Leadership. Government experience is important for the political appointee selected to lead urgent undertaking in the event the political leadership is not provided by the President or vice President personally. Jim Webb's leadership in leading the NASA moon landing project is a familiar example. Likewise, the leadership of John Koskinen and Ed DeSeve was key to the success of those initiatives. All three had significant prior governmental experience as the head of the management part of OMB. Operational leadership must be in the hands of a person with extensive governmental operational experience, such as a career leader.

Attribute 2: Transparency. Investing in the establishment of transparent operations saves time because stakeholders better understood the decisions, and opposition is reduced. For example, the Recovery Accountability and Transparency Board posted on-line every dollar spent under the Recovery Act, along with information on how it was spent. In the case of the 1964 Alaska earthquake recovery operation, every operating decision was made in public meetings where the public could ask questions, make suggestions, or register objections. Accountability was clear.

Attribute 3: Structural Simplicity. Each of these three cases used small, central organizations working out of the White House, rather than building large organizations. Their roles were to provide leadership and coordination of existing agencies, not to take over operations that could be performed by existing departments and agencies that had resources a White House group could never replicate, but would add complexity that would likely cost more and slow operations.

Attribute 4: Streamlined Operations. Similarly, each of the three cases gave priority to simplifying or bypassing existing processes and taking care to add very few new ones. Because of the size of expenditures, the Recovery Act had to develop some new operating procedures, which were required for fiscal accountability. In Alaska, the executive director, Dwight Ink, had tacit authority from the President and key congressional committees to modify, or even suspend, agency procedures that jeopardized the construction timetables required to rebuild public facilities before the short construction season ended. Contracting timetables were sharply compressed.

Attribute 5: Innovation. The combination of complexity and urgency forced each of these three undertakings to provide an environment in which innovation and creativity were essential. This meant careful selection of personnel possessing these characteristics. Prior government experience enabled the leaders to assess the level of risks that could be safely taken.

Attribute 6: Collaboration. Each of these cases relied heavily on collaboration among federal agencies, but even more importantly, collaboration across levels of government and sectors in the economy. For example, fixing the Y2K bug affected not only government at all levels but every sector of society – healthcare, finance, industry, and more. In addition, it affected governments and the private sector around the world. Only addressing the problem in the U.S. was insufficient because of the interdependence of the global economy. So that effort required a global reach.

Attribute 7: Interdependence. Concentrating on just one of the foregoing attributes would have resulted in all three cases failing. For example, in the case of the 1964 Alaska earthquake recovery example, the high levels of transparency, the extra provisions for internal and external oversight, and the emphasis on selecting highly qualified leaders, all contributed to the public acceptance of the dramatic streamlining of operating processes. Otherwise, this approach would not have been accepted by Congress and the media would have launched an array of distracting investigations.

The federal government's capacity to address large-scale challenges that require numerous agencies, as well as state and local governments and the private sector, has declined over the years. Several actions are suggested.

Recommendations to National Leaders to Ensure Capacity to Address Large-Scale Urgent Challenges in the Future

Following are four recommendations that the President and Congress should act upon to ensure the needed capacity is there when the next large-scale, urgent national challenge faces the nation:

Recommendation 1: Use the Career Service More Effectively. The President should rely more heavily on experienced senior career staff to lead large-scale initiatives. Too often, the mindset of incoming political appointees is that their task is to "gain control of the bureaucracy" rather than empower it to move Presidential initiatives forward. The more complex and urgent the government effort is, the more likely that this mindset could contribute to costly failures.

Recommendation 2: Institutionalize the Role of OMB Management Staff. The President and Congress should restore and expand an institutionalized management staff within OMB, but outside the budget process. This staff would be responsible for the design of large-scale management initiatives on behalf of the President. This would include efforts spanning levels of government and sectors of the economy. Presidents used to be able to rely on a cadre of career staff to organize large-scale initiatives, called the Office of Executive Management. President Roosevelt used it to establish and terminate World War II agencies; President Truman used it to organize the Marshall Plan; President Johnson used it to establish HUD and DOT, as well as organizing the Alaskan recovery; and President Nixon used it to launch a government wide organization and program streamlining agenda. The authority exists in OMB. However, Congress should raise its profile by institutionalizing and expanding the staff as it has already done in specialized areas such as procurement and information technology.

Recommendation 3: Restore Congressional-Executive Cooperative Arrangements. The current political climate is serious, but much could be done to restore cooperation on how government is managed as distinguished from the controversial issues surrounding what government is to do or not do. Much of the strength of the earlier Office of Executive Management resulted from reaching beyond narrow confines of budget processes to engage Congress and other actors in partnerships. This earlier management staff helped to establish special temporary congressional linkages in times of crisis. For example, President Johnson appointed a powerful senator, Clinton Anderson, to chair the cabinet policy commission for rebuilding Alaska. In addition, as reconstruction director, Dwight Ink detailed three experienced engineers from two congressional committees to serve as full time members of his staff, ensuring a constant flow of information between the two branches of government.

Recommendation 4: Pre-Authorize Emergency Measures. In times of crisis, special temporary arrangements should be authorized. For example, Congress should enact legislation that permits forwarding requests to Congress for authority to suspend certain categories of agency procedures for a specified period to expedite executive action. Transparency and reporting measures would be required, and some areas such as safety would not be eligible. In addition, Congress should modify its rules to facilitate congressional action during national crises, such as temporary combining key members from several committees into a temporary committee. For example, during the Cold War, there was a House-Senate Joint Committee on Atomic Energy. Also an emergency, a Senate rule is needed to avoid filibusters during a crisis.

Memo #2: Managing Large-Scale, Non-Urgent Presidential Initiatives (by John Kamensky)

Abstract: *Presidents often launch large scale "signature" initiatives on coming into office that are oftentimes implemented through executive directives, not legislation. Their governance structures differ from those used in urgent initiatives because they are longer-term and also they will be – after a time – no longer central to the attention of the President because of the press of events, even if they are still seen as important. We recommend the President use some of the strategies that provided success to other similar initiatives.*

Presidents run for office because they want to do great things for the nation and the world. But how do Presidents get large-scale initiatives done? The President's White House staff typically focuses on developing policy initiatives and getting them adopted. But historically once a policy is adopted; it is delegated to an operating agency for implementation.

This hierarchical model has historically been effective and will continue to work for targeted policy initiatives in areas where a single agency is clearly the exclusive agent for action, such as the implementation of the No Child Left Behind Act. However, increasingly in recent years, success on really large Presidential priorities – climate change, health care reform, management reforms – has depended on extensive cross-agency, and sometimes cross-sectoral, efforts.

The traditional tools of governmental control -- accountability, resource allocation, and congressional oversight jurisdictions – are designed for the hierarchical agency model for implementation and oversight. Managing large-scale initiatives outside the bounds of these traditional tools does occur, but often as an outgrowth of a specific, time-bound, administrative implementation challenge, such as the government's response to the Y2K computer bug, the implementation of the Recovery Act, or to natural disasters.

The governance structure for administratively-initiated large-scale initiative will differ somewhat from government's response to unanticipated, large-scale emergencies – where pre-existing structures are in place and where the agencies involved regularly conduct actual or table-top exercises to keep their skills and networks active. The structure will also differ from Presidential involvement in large-scale scientific endeavors, where it is important to develop long-term consensus among key stakeholders around outcomes that may take many years to bring to completion, often across Presidential administrations.

Three Cases of Successfully Managed Large-Scale Non-Urgent Presidential Initiatives

A review of recently large-scale administrative efforts has identified some conditions for their success, which largely build upon those conditions mentioned earlier for the urgent initiatives – effective leadership and appropriate organizational structures. For example, the following recent initiatives reflect these, as well as several other common attributes:

Reinventing Government Initiative. The Bill Clinton Administration during the 1990s launched a government reform initiative to make the government "work better and cost less to get results

Americans care about." That effort extended the duration of the Administration's two terms in office. It was led by the Vice President and an interagency staff of career managers on rotation from their home agencies. Each agency had its own internal reinvention team. The initial project generated over 1,000 recommendations whose implementation were overseen by the Vice President's project team. These included procurement reform, streamlining administrative functions, and technology reform. In later years, it also sponsored a number of other initiatives, such as streamlining regulations, customer service improvement, advocacy of plain writing in government, and the use of balanced scorecards to manage. The effort ended at the conclusion of the Clinton Administration.

Faith-Based and Community Initiative. The George W. Bush Administration undertook efforts to open up billions in grant money competition to faith-based and non-profit charities so they could be close partners of government in providing social services to the needy. He signed several executive orders, including one that laid out principles and policymaking criteria, and created a White House office devoted to this initiative, which was led by a deputy assistant to the President. Eleven major grant-making agencies were directed to create centers for faith-based and community initiatives and launch their own initiatives. Progress was tracked by the Office of Management and Budget. Thirty-three governors and 100 mayors created similar organizational structures in their respective state or city governments. The effort continued, with a number of changes, in the Obama Administration.

Open Government Initiative. The Barack Obama Administration launched a broad open government effort that focused on the principles centering around increased transparency, collaboration, and citizen engagement. The effort was White House-led with agencies creating their own teams and plans of action. The President also advocated a parallel global initiative on open government, with nearly 50 other countries committing to a set of principles and developing their own plans of action.

Common Attributes of Successful Large-Scale Non-Urgent Initiatives

These various initiatives were typically based on guiding principles rather than detailed guidance. This allowed each agency to adapt the principles to their own operating cultures. Cross-agency working groups permitted the sharing of ideas and created a network of committed individuals. This also helped the White House embed these initiatives into the bureaucracy. In addition, each initiative relied on periodic symbolic events – such as new executive orders, awards, progress reports, and conferences -- to demonstrate the continued commitment of the President toward the initiative.

The common attributes of success among these initiatives include:

- Pairing a political head with a career deputy to offer "reach" into agencies involved in implementation
- Replicating the function or initiative within agencies (and states, where appropriate) to provide greater reach and ongoing commitment within agencies
- Measuring and reporting progress on a regular basis
- Relying on agency-provided staff on temporary assignment
- Relying on shared agency funding, either direct or in-kind.

Based on the experiences of these initiatives, the President should proactively anticipate the need for both the talent and the administrative governance framework necessary for successful implementation of his key policy initiatives.

Recommendations to the President to Ensure Capacity to Address Large-Scale, Non-Urgent Challenges in the Future

Recommendation 1: Identify a Cadre of Seasoned Executives. The President's transition team should consider designating someone – such as the Deputy Director for Management, a Deputy White House Chief of Staff, or the Director of the Office of Administration – as the point person to help lead the implementation of any large initiative once a particular policy has been adopted. Having such a contingent capacity in place will make it easier to take action and to ensure the elements of success from past efforts can be put into action.

This person should develop a list of highly-regarded individuals, from among the existing cadre of career senior executives, with experience in managing large-scale initiatives that reach across agency boundaries. This list should number between 50 – 100 people from across the government in different policy arenas. They should have prior experience in working on cross-agency initiatives.

Provide these people with targeted training and opportunities to convene among themselves, or at least with counterparts with common areas of expertise, so they can create informal networks. This approach is used successfully in developing senior military flag officers and should be expanded to their civilian counterparts. Also consider high-profile rotational assignments for these individuals, so they can expand their experiential knowledge across agency and expertise boundaries.

Recommendation 2: Develop a "Lessons Learned" Guide for Network Governance. Seasoned and experienced leaders cannot operate alone. Past experience shows that they operate most effectively in the context of an effective governing approach. Recent experiences have been that such governance approaches either evolve before an initiative is undertaken, or one is put in place once a leader has been designated. For example, Ink, Koskinen and DeSeve all chose to use a small staff located in the White House, instead of a large team. They found it much less costly and far less time consuming to quickly streamline existing processes and expedite agency operations than to complicate operations with adding a series of new structures and processes.

Sometimes, however, a leader finds him- or herself designed and constrained by structures or processes that may have been put in place shortly before they took the position and they find themselves having to work within those constraints. Understanding these statutory or procedural constraints in advance is critical to developing an effective strategy.

Since a President will likely undertake a large-scale initiative during his term, he should early in his administration ensure a common understanding of effective practices is developed among key stakeholders who would be involved in implementing any such initiative. The GPRA Modernization Act offers the statutory basis for expanding the use of cross-agency initiatives to achieve policy priorities. This law also requires the President to identify a handful of cross-cutting priorities for implementation

by February 2014. A handful of interim priority goals already exist, but each priority goal leader has been left to his or her devices in developing and staffing their individual priority goal teams. These interim efforts should be assessed and effective practices developed for use, beginning in early 2014, more widely by each of these teams, and by any other large-scale efforts proposed by the President.

The President's staff should undertake a "lessons learned" review of the governance approaches developed to manage the existing cross-agency priority goals. Successful practices from previous large-scale administrative initiatives, such as the implementation of the Recovery Act, should also be included. The resulting guide would speed the implementation of any new large-scale effort as well as improve the chances of success.

Memo #3: Managing Large-Scale Presidential Science and Technology Initiatives (Harry Lambright)

Abstract: Presidents periodically commit the nation to large-scale science and technology projects that may take years to complete. To survive different political administrations, successful "Big Science" projects have to be organized and managed differently than other large-scale Presidential initiatives. They require long-term consensus by key stakeholders, stable funding, and a strong leadership cadre within an agency setting. We recommend that the President heed these and other critical factors when launching a Big Science initiative.

If the next President decides to take a major policy initiative in science and technology, he will be in good company. Since World War II, most Presidents have used science and technology ("Big Science") programs to achieve major purposes. They establish large-scale ventures—national projects—often costing billions. Most projects take longer to go from concept to conclusion than the tenure of the Presidents who started them. Indeed, there are projects that last so long that succeeding Presidents can put their stamp on an activity a predecessor began.

Consider what various Presidents have done since World War II. President Roosevelt authorized the Manhattan Project; President Truman, the H-Bomb; President Eisenhower, long-range missile development; President Kennedy, Apollo; President Nixon, energy independence; President Carter, energy independence; President Reagan, "Star Wars" (the space based missile defense project); President Reagan, the Space Station; President George H.W. Bush, back to the Moon and on to Mars; President Clinton, the International Space Station; President George W. Bush, Moon-Mars (called "Constellation") and President Obama, space commercialization. Most national projects start off as agency proposals and are subsequently elevated to Presidential status, the most notable example being the Genome Project, which Clinton made his own.

Why do Presidents adopt Big Science initiatives? Why do some projects succeed, while others fail? What lessons does history have for a possible future venture by the man sworn into office in January, 2013?

The answer to the first question is that Presidents use science and technology to solve or mitigate problems. The problems are typically war, cold war, energy security, health, or economic development. Moreover, they also find science and technology programs valuable in making a statement about national prestige. They see Big Science as engaging extremely talented people and the general public in great ventures that equate with "progress." They use science and technology to demonstrate leadership—for the nation and themselves.

Critical Success Factors to Consider

But, as the list above makes clear, not all initiatives succeed. What are critical factors in success and failure in Big Science? Following are factors that we recommend the President and his team seriously consider if he decides to commit his Administration to a "Big Science" initiative:

Realistic goals. The goals must be technically realistic. Reagan's call for an impenetrable defensive shield based in space was undoable. So was a now-forgotten initiative of Nixon to wage a "war on cancer." At the same time, goals should be bold—as Apollo and Genome Project were. That way they can capture the attention of the public and politicians and the funds to succeed. How the goals are framed is

important. They have to be a good match with the problem to be addressed. The Moon landing within the decade, (a deadline) converted the Cold War competition with the USSR into a race that the US had a chance to win. The goal was clear, and clarity is important in focusing the nation.

Strong agency capacity. Big goals require strong agencies to carry them out. NASA in 1961 could not implement Apollo, but NASA in 1969 did so. Early in the 1960s, NASA was remade into a powerful organization. Where Big Science ventures succeed, there is a strong government agency in charge. Agencies can be built up, created anew, or reorganized to enhance capacity. They need outstanding personnel with "the right stuff." The Genome Project required transfer from DOE to NIH leadership and NIH needed to create a new institute to manage this project.

President Nixon, in seeking energy independence, did not establish an organization capable of promoting it effectively. President Carter, in pursing the same goal, created the Department of Energy— but it proved inadequate for the task.

Effective organizational systems. Science and Technology initiatives may be led by individual government agencies, but the work is performed by industry, universities, and federal laboratories. Historically, these organizational systems have been dominated by domestic teams (e.g. Apollo had 400,000 people at its peak). But, increasingly, agencies in the US require international partners in addition to domestic contractors and grantees. The Genome Project could not have been carried out at the pace undertaken without the partnership of NIH with a counterpart in England. Similarly, the International Space Station is an international project involving many nations. The US (NASA) is the "managing partner," but is reliant on Russia for transportation to the facility. Without Russia, it is arguable whether the Space Station could have succeeded given US problems with the Shuttle (another Big Science project of note).

The US may not always be the dominant partner in a large-scale project. The Large Hadron Collider is a European project, with the US as a junior partner. Typically, Presidents do not want initiatives where the US is a minor player.

Another emerging model of an organizational system is seen under Obama and his commercial space effort. Here, the US (NASA) seeks to create a new industry to take the place of the retired shuttle (and Russia) in transporting cargo and humans to the space station. Doing this requires public money, but also private money, with the balance in payments shifting from public to private over time. The goal of commercializing space is to free NASA to concentrate on deep space projects, ultimately Mars. Obama has made Mars the long-term goal, as had the two Bushes,. The difference is that Obama has called for an asteroid in 2025 as a stepping stone rather than the Moon.

Bi-partisan political support. Large scale science and technology projects require political support over the long haul. It is not enough to have goals that are technically ripe. They must be politically ready also in terms of congressional, interest group, and public support. And that support must be maintained through implementation. They first Bush came out with a Moon-Mars initiative that never reverberated with the democratic-run Congress. The second Bush also had a Moon-Mars initiative and he failed to give it political support in regard to promised resources. It is not clear how committed Obama was to his asteroid-Mars goals. Without big money, Big Science does not get done.

The real test lies with political will over the years. Apollo succeeded because Kennedy was followed by Johnson. When Nixon became President in 1969, Apollo was at the point of the lunar mission, and he let

it happen. But he ended the Moon program in 1972. It would appear essential for these projects to get off to a fast start and show results within ten years or sooner, even if they last longer. Apollo built up to the Moon through interim steps—Mercury and Gemini. There were genetic maps of simpler organisms leading to the human genome. Success breeds political support. Failure is an excuse for cancellation.

Obviously, Nixon, Carter, and DOE could not produce enough success in energy independence for this initiative to survive. Whatever support DOE had under Carter for energy independence vanished under Reagan. Reagan's Star Wars project faced the same fate as he gave way to the first Bush. Missile defense continued, but not the grandiose project of Reagan.

Competition. Interestingly, competition helps in creating and maintaining political support, and generating a sense of urgency. This was true in the space race with Apollo, between the U.S. and the Soviet Union, and in the human genome race between the public and private projects. In seeking to commercialize space transportation to the International Space Station, NASA has used competition among firms. However, competition is not always necessary. There are Big Science projects that have succeeded where competition was replaced with cooperation. For example, Clinton helped keep the Space Station going by adapting the goal from competition with the Soviet Union (Reagan's rationale) to cooperation with Russia after the Cold War ended. It became a symbol of post-Cold War cooperation (and a covert way to aide the new and shaky Russian regime).

Experienced Executive Leadership. Absent James Webb, it is unlikely NASA could have gotten to the Moon in 1969. The ideal executive for a large-scale science and technology project is one is both an astute manager (inside role) and a savvy politician (outside role). Lacking such qualities, a project usually has troubles. The leader has to be an institutional builder—and usually a change agent on a large scale. And he/she has to think increasingly across agency lines to organizational systems. The leader must be an able advocate for the project. Sometimes the qualities it takes to start a project are different from those to maintain it. That was surely true of the Genome Project. The charismatic James Watson got it underway; the steady and managerially competent Francis Collins implemented it. At the same time, stability in executive leadership may be essential for projects that last over different Presidential terms. Dan Goldin of NASA set a record for longevity, serving under Bush, Clinton, and Bush 2. That longevity helped him get the International Space Station up and occupied.

Conclusions

In conclusion, there are many factors that contribute to Big Science success and failure. Goals, agency capacity, organizational systems, political support, and executive leadership are all essential.

If the next President needs a candidate for a Big Science effort, I would vote for climate/energy. This is the biggest problem today for which science and technology is relevant. Other Presidents have sought energy independence and generally failed. Today, climate change creates a different driver for change in energy technology and one likely to be increasingly compelling for the US and world. True, the problem goes beyond science and technology to many other policy tools—such as regulation, fuel efficiency, and cap and trade. But science and technology is a substantial part of the mix of responses needed.

Can government lead in climate/energy? The "solutions" reach across agencies, public-private sectors and nations. Whoever is President could shy away from such a monumental challenge. But why run for President if you don't want an opportunity to deal with the biggest issues, and thus make history.