The Bomber Roadmap

Enhancing the Nation's Conventional Bomber Force

June 1992

America's long-range bomber force has always had a unique ability to reach across the globe to project power. The end of the Cold War allowed the Air Force to think about using these unique assets—those on the ramp and those under construction—to augment our ability to fight regional wars, with highly effective conventional weapons, from day one of a crisis. The Roadmap lays out a careful, fiscally prudent plan to capitalize on the global reach inherent in the bomber force. It focuses on enhancing survivability, weapons carriage, and flexibility to match the demands of decreased overseas presence, declining defense budgets, and continuing American interests overseas. It is a prudent plan for a precious resource.

Over the next several decades, U.S. national security will increasingly depend on conventional bombers to meet the demands of responding rapidly and decisively to security threats that may emerge in various regions of the world. No other resource in our security arsenal brings together the reach, flexibility and precise firepower inherent in the land-based bomber force we are developing. To meet the challenge of converting from a bomber force focused on nuclear war to a smaller, more sophisticated force equipped to perform a variety of conventional missions, the Air Force decided earlier this year to prepare an internal study of the post-Cold War bomber force. Our "bomber roadmap" outlines the operational concept and structure for the bomber force—and presents an overview of the investments required to enhance and support it within a reduced Air Force budget.

A New International Environment

America shares a responsibility to defend U.S. interests and those of our allies in many regions around the world. A security strategy focused on regional dangers calls for the ability to deter and counter a range of potential threats, even though the location and technological sophistication of these threats will be hard to predict. Long-range conventional airpower is a core capability that enables us to act quickly and decisively in major regional contingencies and other scenarios. It is hard to say what type of international environment we will face or how fast we will have to respond ten or twenty years from now. The Iraq of 1981 did not have a threatening ballistic missile force or an underground network of nuclear facilities and command bunkers, and its air force and air defense network were rudimentary compared to what it achieved by the time of the invasion of Kuwait in 1990.

In the face of this uncertainty, bombers have inherent strengths no other weapon system can match. Their combination of range, payload and flexibility makes bombers the theater commander's weapon of choice for both crisis response and sustained operations.
With advanced conventional munitions and other upgrades, we can multiply these strengths.

Until recently, our plans for the bomber force centered on a dominant nuclear and a secondary conventional mission. The failed Moscow coup in August 1991, the President's initiatives reducing nuclear weapons, and the breakup of the Soviet Union all but removed the threat of global war from our planning index. Nothing brought home the difference better than the day last winter when two USAF B-52 bombers and a KC-10 tanker left Barksdale AFB, Louisiana, for an official visit to Moscow. Incredulous air traffic controllers across northern Europe could not believe B-52s were heading for Russia. When they landed, it was more than a gesture of friendship. Parking B-52s on the ramp at Ryazan Air Base symbolically closed one chapter in bomber history and opened another.

"Conventional" is the key word in the title of that new chapter. To prepare the bomber force for a primary emphasis on a range of conventional missions we looked to another milestone: the role of airpower in the Gulf War. Operation Desert Storm graphically illustrated that over the next several years we must draw on a rising curve of technological sophistication to multiply the effectiveness of conventional bombers—by investing in precise munitions, stealth and other conventional enhancements—even as the bomber force structure declines.

Bottom line budget realities challenge us to set clear priorities. Programs scheduled in the roadmap build on already planned investments in the bomber force to add maximum capability for a small price tag. One of the tasks of the roadmap is to determine what modifications are required for the B-1 and B-52, in part to compensate for decreasing the B-2 buy to 20 aircraft. Another task is to trim the B-52 force. Most of all we aim to increase conventional capabilities across the fleet, and work on smart tactics to integrate the B-2s, B-1s, and B-52Hs into an effective whole.

With these tasks in mind, the roadmap was originally prepared in response to Air Combat Command's and the Assistant Secretary of the Air Force for Acquisition's requirement for a "roadmap" to serve as an internal Air Force guide to investment and force structure priorities for the conventional bomber force. This document combines Air Combat Command's force analysis with investment priorities to answer three main questions:

- What is the conventional bomber mission?
- What is the right bomber force structure and what should be our operational concepts and specific plans for the B-52, B-1 and B-2?
- What is the investment plan for the 1994-99 FYDP and beyond?

The Conventional Bomber Mission

With the end of the Cold War, America's bomber force best serves the warfighting commander—and the taxpayer—with an increased emphasis on the conventional role.
The bomber force will retain its nuclear capability, but our training and force structure planning is shifting toward a wide range of conventional missions. Two years ago, B-1 crew members logged less than a third of their time covering conventional mission training. This year, they will spend two-thirds of their training time putting the B-1 through its paces for conventional missions.

Under the new Air Combat Command, bomber crews are preparing for a range of missions that break old stereotypes. There will almost certainly be occasions in the future when the United States must act to protect American lives, property, or interests around the globe. Bombers can provide the tools for an initial response or a precision strike like that in Libya in 1986, or deploy forward for a show of force. For campaigns of greater duration, bombers can deliver mass as well as precision. Closing more bases overseas will increase our dependence on long-legged bombers to respond to any threat around the globe.

The bomber force will also fulfill its bedrock commitment to nuclear deterrence missions. While nuclear requirements are reduced, bombers will still provide the most flexible leg of our deterrent triad and contribute unique abilities (to go on alert, deploy, launch, recall, or redirect) in a crisis. We may particularly value the bomber's flexibility as a deterrent in the future, if more states gain and deploy nuclear weapons. The focus on conventional missions does not mean that we will shortchange fundamental nuclear mission requirements. Rather, with the roadmap investments, we gain greater value from the force.

In planning for the future, the sustained theater air campaign joins deterrence as the core mission of the bomber force—and the one that makes a flexible, tailored response to other situations possible. The plans and priorities laid out in the roadmap revolve around improving our performance in what we see as the most demanding bomber missions: providing both initial response and sustained firepower for a theater air campaign, from CONUS bases if necessary. Our future bomber force must enable the theater commander to hold at risk and attack an enemy's war-making potential, especially those time-critical targets which, if not destroyed in the first hours or days of a conflict, would allow unacceptable damage to be inflicted on the friendly side. These targets include:

- Emerging capabilities for the production, support and use of weapons of mass destruction
- Massed conventional forces of an adversary threatening or invading a friendly state
- Key nodes of enemy command and control, and air defenses
- Enemy air attack assets and other offensive capabilities
- Enemy capacity to wage war

The art of inflicting operational paralysis depends on hitting a careful selection of the enemy's most valuable targets in a short span of time. Before Operation Desert Storm,
General Horner's staff compiled a list of over 200 priority strategic targets to strike with joint and coalition air forces at the beginning of the war. The list reflected the types of priority targets listed above. We used the Desert Storm experience as an example for future requirements and identified a hypothetical list of 238 initial, high priority targets that a theater CINC might have to destroy early on—within the first five days— to unhinge an enemy's strategic plan, stall his offensive and pave the way for joint forces arriving in theater. The list divided into 1250+ individual target elements—the aimpoints or corners of a building, for example—that must be hit to destroy the target set.

To provide maximum support for the theater CINC, the bomber force should be able to strike the priority target elements in the first five days and have adequate force structure to sustain operations against the next layers of targets. In the chart shown below, we projected the performance of today's bomber force of B-52s and B-1s under wartime conditions, assuming a .4 sortie rate from the United States (with a 75% mission capable rate added on) and a standard crew ratio. Under those conditions, in 1992 the B-52s and B-1s could destroy at best about 300 or 24% of the 1250+ target elements. That falls short by 76%, because today's force of B-52s and B-1s is limited in precision conventional weapons capability, robust anti-armor capability, and flexible employment options. Without substantial improvements, the theater CINC would not be able to inflict operational paralysis on enemy ground, air attack or air defense forces—or even stall operations—until weeks or months passed to allow time to bring joint forces into the theater.

![Pie chart showing Bomber Force Priority Target Coverage](image)

Target numbers alone do not give the full picture of why enhanced conventional weapons and the delivery of the B-2 are so important to increasing effectiveness. Time is also critical. Stretching out the first phases of the air campaign is not an option when enemy forces are on the move. Also, many of the enemy's most vital capabilities are fleeting targets that must be hit before they are dispersed. Paralyzing enemy operations demands
coordinated, simultaneous strikes on key nodes throughout the target system so that the
defenses, communications, and military forces collapse together.

In the future, we cannot bank on having the luxury of the five months of Operation
Desert Shield to deploy all the capability we need to hit critical targets with shorter range
forces. Future adversaries could overrun key objectives and capture ports and airfields,
crippling our ability to establish sustained in-theater operations and to inflict operational
paralysis. Even with forward deployed aircraft carriers and allies providing forward
bases, we cannot count on bringing in shorter range aircraft rapidly enough to stop enemy
forces on the offensive and sustain the attack. These trends make it prudent for us to build
more immediate and effective response capability into the bomber force so that we can help
defending forces keep a foothold—or more—for follow-on forces.

Also, future adversaries will harden valuable targets and improve air defenses around
the target areas we want to hit first—such as command and control facilities, and weapons
of mass destruction. Precision weapons are the only good answer to minimizing collateral
damage and reducing the number of sorties we must fly to strike difficult targets.

To meet future requirements, we plan to cut less capable force structure as we bring
advanced conventional munitions and support on line and take delivery of the B-2. With
roadmap programs, the bomber force of B-2s, B-1s and B-52s will become significantly
more effective in several key areas. Under the same wartime sortie conditions described
above, we achieve the ability to hit most of the priority targets just after the turn of the
century. By FY 01, with the enhancements, the bomber force will be able to destroy all
1250+ target elements of the most critical targets in the first five days—and bring
new antiarmor and other capabilities to bear against ground force targets, too. Completing
the B-2 buy will ensure that even the most heavily defended targets are not immune
to strike. As sustained operations continue, the theater commander can assign B-1s, for
example, to add mass to joint force packages and use bombers in a variety of mission
profiles.

The National Military Strategy requires us to prepare for a second contingency that
could arise while some forces are still engaged in the first. If such a threat emerged, a
portion of the bomber force could swing to deploy forward to the second theater and strike
time-critical targets until follow-on forces arrive. The bomber’s ability to neutralize high-
value targets provides us essential freedom of action to stop the enemy offensive and build
up our own joint forces.

**Force Structure, Weapons, and
Operational Concepts**

Once we outlined the bomber mission profile, the next step was to decide on the
appropriate force structure mix stemming from projected requirements for major regional
contingencies, plus nuclear deterrence. The Total Aircraft Inventory force structure of **95
B-52Hs, 96 B-1Bs, and 20 B-2s** meets future requirements. With that force structure,
our analysis shows that we will be able to strike the priority target set under the harshest
wartime conditions—35 hour CONUS to CONUS missions, an overall .4 sortie rate, and a 75% mission capable rate. A hard look at future requirements led us to the decision to retire all the B-52Gs in coming years, as we transfer their conventional capabilities onto B-52Hs.

Not all of the total number of airframes will be available to theater commanders. Accounting for training requirements and backup inventory (depot maintenance, tests, etc.), the force structure provides theater commanders with a maximum of about 80 B-52Hs, 80 B-1Bs and 16 B-2s. For the B-2, we plan just 4 aircraft in backup inventory. The total force structure is consistent with Department of Defense guidance and Joint Staff analysis of the bomber role in major regional contingencies. The B-52H, B-1 and B-2 can retain their nuclear potential—as needed—in accordance with CINCSTRATCOM’s evaluation of future requirements.

Effectiveness is at a premium with a shrinking bomber force structure and there are two keys to maximum effectiveness in conventional roles: advanced munitions and smart tactics.

The Joint Direct Attack Munition (JDAM) program grew out of Air Force and Navy requirements and will provide direct attack capability based on an inertially-guided, Global Positioning System (GPS) assisted munition. The JDAM I is a 2000 pound weapon that will be accurate to within less than 45 feet. (JDAM II centers on a 500 pound class Navy weapon.) JDAM III, a more advanced 2000 pound class weapon, will combine the INS/GPS technology of JDAM I with a precision seeker to strike within less than 10 feet of a target, day or night, in adverse weather. Even in regions like the Middle East, cloud cover can obstruct targets up to 30% of the time and for Northeast Asia the figure rises to as high as 60% in the worst weather seasons. JDAM’s ability to overcome poor weather conditions is a big step forward.

The Joint Standoff Weapon (JSOW) will provide accurate standoff anti-armor capability, enabling bomber aircraft to launch outside the range of ground unit antiaircraft defenses, and achieve multiple kills per JSOW using sensor-fuzed submunitions. The Tri-Service Standoff Attack Missile (TSSAM) will combine extended range (100nm+) with an autonomous precision warhead and a combined effects submunition in a highly stealthy cruise missile to yield tremendous flexibility and the ability to destroy small, high-value targets from outside the high-threat environment.

Older, less glamorous weapons remain essential. The B-52, B-1 and B-2 will carry conventional ordnance such as the 2000 pound Mk 84 bomb, for use against a range of targets that do not demand precision delivery. All three bombers will also have air-deliverable mine-laying potential to augment the Navy’s sea denial capability. B-52Hs with Harpoon provide anti-ship capabilities.

Our operational concepts rely on each system to employ advanced conventional weapons in ways that play to the platform’s strong points, as shown below.
This chart depicts the foundation of what we call “smart tactics”—employing each bomber against the threats where it will perform best. Smart tactics is about gaining top performance from the whole force by starting with the job of equipping and developing complementary tactics for individual systems.

The B-52

• **Primarily a standoff platform**

• **Precision and massive firepower in low threat environments**

Boeing's Stratofortress, designed in the late 1940s and early 1950s, has served superbly for decades as the mainstay of our nuclear and conventional bomber force. Modification of B-52Gs in the early 1980s provided a credible conventional capability which we exercised in the Gulf War. Despite the B-52Gs' outstanding record, we chose to retain the slightly newer B-52Hs for several reasons. Their fanjet engines are 30% more powerful than the B-52G water-injected engines, and the B-52Hs cost less to operate, have a greater range and can fight more easily from austere locations on short notice.

The B-52Hs we keep will fill two important roles. The first is as a **standoff weapons carrier**. We plan to incorporate this capability early to compensate for the increasing drawbacks of the B-52's large radar cross section and slower speed. Using conventional
cruise missiles, the B-52H will be able to strike fixed targets in defended areas at acceptable risk. In some cases, after U.S. forces deploy to a theater, the B-52H may be able to launch standoff weapons from airspace secured by joint air superiority assets. Second, just as in Desert Storm, the B-52H will retain the ability to deliver massive firepower in areas of lower threat. The B-52’s ability to lift 38,000 lbs of bombs from bases anywhere in theater will grow to include precision weapons toward the end of the decade. Ongoing upgrades such as GPS are enhancing penetration and stand-off capabilities. The B-52Hs will continue to penetrate for special missions until the B-1s and B-2s are ready to pick up these taskings.

B-52H PROGRAM PLAN

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Investment today in converting the B-52H to a conventional role will pay off quickly by bringing advanced conventional capabilities into the force within five years. Forty-seven B-52Hs will gain new precision standoff (conventional ALCM and TSSAM) and precision direct attack (JDAM I) capabilities. These modifications will enable it to stand off and attack many targets early in the war, and operate in a more effective direct (precision) attack mode later. Heavy stores adapter beams on the pylon stations will allow the B-52H to carry heavier weapons—like TSSAM and JDAM—under the wing of the aircraft. Integrating the military standard 1760 interface between the cockpit and the weapons bay adds the capability required to target and employ advanced weapons. The B-52H is already capable of carrying the ALCM, or conventional ALCM-C, on ALCM unique pylons.
Ten of the 47 B-52Hs will be modified to carry Have Nap and 19 will carry Harpoon missiles. In May 1992, the Air Force redirected the RDT&E and integration of the Tri-Service Standoff Attack Missile (TSSAM) from the B-52G to the B-52H.

The B-1

• **Standoff or penetrating platform**

• ** Adds sustained mass and precision in composite packages**

The B-1 is a superior airframe that will guarantee leading-edge performance well past the turn of the century. Of all three bombers, the B-1 has the highest speed and greatest payload. After completion of an improvement program on its electronic countermeasures equipment the B-1 will be able to penetrate all but the highest-threat environments (where only the B-2 can perform.) Modern capabilities and sheer numbers make the B-1 the backbone of the conventional bomber force, and the only system that can compensate for the potential shortfalls in target coverage stemming from the decision to complete the B-2 buy at 20.

**Destroying the bulk of defended time-critical targets** early in a conflict, using direct attack or standoff munitions, will be the B-1’s primary role. To sustain the theater campaign, the B-1 will also **add mass to composite force packages**. Near-supersonic sustained airspeed and maneuverability give the B-1 the unique ability to fly with Air Force fighter aircraft in force packages much like the F-111 did in the Gulf—but instead of four 2000 pound weapons, the B-1 can carry as many as **twenty-four**.

Enhancements to the B-1 will complete its transition from a nuclear-focused system to a more versatile bomber. It will receive more precise attack capabilities, both direct and standoff, to allow it to “shoot and penetrate.” These capabilities can work in tandem with the B-2’s strong suit in leading the initial response, and will allow the theater commander to plan a broad range of airstrike options even in the absence of substantial forces predeployed to the theater.

The top-ranked programs in the roadmap invest in the B-1. These are essential programs that equip the B-1 to take over as the centerpiece of the bomber force. The Air Force will continue to request funds to procure deferred support equipment to establish in-house support capability and free itself from the annual cost of interim contractor support. On the roadmap procurement schedule we plan to phase out costly interim contractor support by FY 99.
The Electronic Countermeasures (ECM) program is also one of those top priorities. Our approach to the ECM program is a good example of how we are shifting away from Cold War missions. Originally, the ECM specifications were for low altitude missions against Soviet air defenses. In regional conflicts, enemy air defense systems may be less than state-of-the-art—but considerably more varied and unpredictable. Concentrations around valuable targets may be nearly as difficult as some of the postulated routes in the former Soviet Union. Because this diversity increases the number of countermeasures challenges for the B-1 crews, implementing effective ECM and other endgame capabilities is actually more crucial for conventional mission profiles. The roadmap ECM program completes the aircraft ECM improvement that was stopped in FY 90 after restrictions were enacted by Congress. Funds requested in FY 93 recommence the ECM activities and analysis; then, in FY 94, the roadmap starts Engineering and Manufacturing Development (EMD) under a completely revised ECM program. The program emphasizes filling the 13 B-1 aircraft currently lacking full ECM, standardizing the defensive configuration within the fleet, and providing the improved ECM capability for the B-1.

The B-1 currently has an unguided conventional bombing capability and limited sea-mining potential. Certification for additional types of conventional munitions is underway. Adding the JDAM I, JDAM III, JSOW and TSSAM will give the B-1 highly accurate weapons and expand the number of targets the B-1 can strike. The priority funding for the JDAM I also incorporates the military standard 1760 interface and replaces the 1970s vintage, 128K computer with high-speed, high-capacity computers fitted with new software to employ smart weapons.
Not shown on the chart is the investment in readiness spares that will outfit 48 B-1 bombers to deploy overseas on short notice. In a crisis, the spares will keep the B-1s flying at the heavy utilization rate required under the high-stress conditions of sustained CONUS or forward-based conventional operations.

The B-2

- **Penetrates and survives on the first nights**
- **Destroys highly valued, heavily defended targets**

Future adversaries will vigorously defend their most valuable and critical targets. The B-2's ability to penetrate to the heart of an enemy's defenses is key to a theater commander's ability to wage a devastating air campaign. Low B-2 numbers stress its unmatched qualitative contribution—striking the toughest targets with precision and enabling the other bombers to strike theirs.

The B-2 is the pivotal tool for inflicting rapid operational paralysis. To attack heavily defended targets, the B-2 will penetrate current and projected threat environments with a very high degree of survivability against enemy fighters and air defenses. Stealth and precision give the B-2 a revolutionary advantage in combat operations, making it the leading edge of our initial response to conflict. Reaching from U.S. bases the B-2 can attack the nerve center of enemy capabilities alone and at will. In sustained operations, B-2s can neutralize defenses to allow the less survivable, but more numerous, bombers and other systems to operate in a less lethal environment. Also, the B-2 has the potential to employ precision weapons to attack ground forces, adding flexibility for initial response and throughout the campaign.

Bringing the 20 B-2 fleet into day-to-day operations is an integral part of our plans for the bomber force. The first B-2s are currently due for delivery to Air Combat Command by the end of calendar year 1993. Two squadrons of B-2s, equipped with the proper precision munitions, give the theater commander the ability to hit both priority strategic targets and advancing enemy ground forces in the first stages of a conflict. B-2s on the ramp at Whiteman AFB hold at risk targets ranging from nuclear and chemical weapons production to command and control facilities. Because they can hit these heavily defended, time-critical objectives before most other assets are positioned in theater, the B-2s add their own unique contribution to our forward presence before they even leave the country.

For the B-2, the costs of integrating the conventional weapons covered in the roadmap are funded in the President's FY 93 budget request and within the total baseline program cost to complete the B-2 buy of 20 aircraft. The following chart shows the schedule for integrating advanced conventional weapons on the B-2.
B-2 PROGRAM PLAN

Also included is a deployable mission planning system for specialized stealth route planning and advanced weapons targeting away from the main operating base. This is a major improvement over the mission planning system originally designed to support predetermined nuclear and conventional missions via planning done at STRATCOM in Omaha. The current system has only a limited capability at the main B-2 operating base at Whiteman AFB, but the deployable mission planning system accommodates rapid changes in scenarios and mission profiles. It will become an integral part of the common Air Force Mission Support System (AFMSS) now under development.

Investment Strategy

The end goal of the roadmap is to spell out an investment strategy for procuring and integrating the major support and conventional enhancements we will need. (A number of already ongoing safety and reliability and maintenance modifications are not discussed here because they do not specifically address evolving combat capabilities.)

Priority investment items meet two demanding requirements: they bring about an immediate payoff in conventional capability, and invest for the long term to achieve the greatest payoff in total bomber force capability. As shown in the figure below, there are two major categories of investments.
Support costs—such as spares and war reserves, B-1 deferred logistics, and ECM fixes—account for the largest share of roadmap investment. These support programs are critical to our ability to deploy bombers and to decrease maintenance costs. Other support programs include changing bomb racks and adding GPS receivers. Conventional enhancements cover the stand-off weapons (TSSAM and JSOW), JDAM, and supplements such as deployable mission planning for the B-2 and simple modifications for the B-52H to employ advanced conventional munitions. Specific programs for both support and conventional enhancements are outlined in the next chart.

All the programs follow a “fly-before-buy” approach: each advanced weapon will be developed and proven before full procurement. Weapons integration dovetails with the process of weapons development to reduce potential integration risks and unforeseen costs of integrating the weapons on the bombers. Accordingly, integrating the first advanced
weapon will carry the burden of the total integration cost for all systems. Each follow-on will be relatively low risk and cost since the military standard 1760 interface will already have been installed.

The chart below compares the relative investment for each aircraft when the cost of all roadmap priorities are considered.

The **B-52H** investment is minimal—primarily for GPS and stand-off capability. Modifications will be installed using organic Air Force assets to maintain combat readiness to the maximum extent possible. As the **B-1** becomes the mainstay of the bomber force, its inherent capabilities of speed, payload and maneuverability make it worthy of the majority of the investment. Several investments in capability and weapons to switch the B-1’s emphasis from nuclear to conventional roles are already in the budget and new costs capitalize on prior investments. The majority of the roadmap costs are B-1 related, because **investment in the B-1 has the highest payoff in the long run**. The **B-2** weapons integration and support are fully funded and contained in the $44.4 billion baseline B-2 program. There is no additional price tag for the capabilities featured here; these enhancements are discussed because they are a logical part of our plan for the bomber force.

The total investment for both support and conventional enhancements is very modest in real terms. Investment gleaned from within the overall Air Force budget yields a high payoff in added capability and clears the way for savings to be reaped from overall reductions. The following chart shows the funding profile for each system. For the **B-52H** and the **B-1**, new investment for FY 94-99 covers weapons integration and continues support programs.
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<td>*Funding deferred logistics investments allows well over $300M savings in ICS to end of FYDP, and $150M per year thereafter</td>
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All B-2 costs are included in $44.4B baseline program

Totally funded, the roadmap is paced at an average of $485 million annually (then year dollars) over the next six years, or 18% of the total annual expenditure on bombers. Even with the roadmap programs the overall total expenditures for the bomber force drops 63% by the end of the decade. TOA spent on bombers tapers off even more sharply than the overall defense budget slope.

The “cost to go” below displays the cost required to support the bomber force over the FYDP (FY 94 - FY 99) in relation to the Total Obligation Authority (TOA) for the three strategic platforms beginning in FY 92. The large shaded area represents all the operations and maintenance, military construction, spares, safety modifications and other costs routinely associated with the daily operations of the bomber force. Also included is the decline in cost for RDT&E and procurement for the B-2. The shaded area investments are the foundation to maintain and operate the bomber force. These costs, although not “fixed” costs, represent the funds required regardless of mission enhancements. The top
bands show that both support and conventional enhancements maximize capability for a fraction of foundation costs.

About three quarters of the total roadmap investment is complete by FY 99. Some investment will be required beyond the FYDP and through FY 03 to complete all weapons integration and other roadmap programs in FY 04. This level investment strategy reduces the overall risk and allows for the most prudent integration of the advanced weapons as their development and flight tests reach completion toward the turn of the century.

What do we get for the money? The roadmap programs translate the rising curve of technological sophistication in advanced conventional weapons into a dramatic upswing...
in capability. The chart above reiterates raw quantitative measurement of effectiveness: the number of targets hit by the bomber force in the first five days of conflict.

Comparing the beginning and the end of the roadmap programs shows the proportionate increase in capability. What this simple graph cannot show is the corresponding increase in flexibility for theater commanders to tailor the initial response and to combine bomber forces with other assets in sustained operations.

**FY 1993 President's Budget**

Funds in the FY 93 President's Budget are an indispensable bridge leading to the roadmap programs.

**B-52:** The FY 93 President's budget requested a total of $76.7 million for continued modifications to the B-52. Of that request, $47.2 million will be directly applied to the roadmap priority programs for the B-52H. On the list are the continued installations of the secure voice ARC/210 radios and the GPS receiver hardware. The FY 93 request also starts installation of the integrated stores management system in the B-52H offensive avionics, and begins Harpoon and Have Nap integration. All are on the priority list for the B-52H for FY 94 and beyond.

**B-1:** The B-1 request for FY 93 includes both RDT&E projects and aircraft procurement activities that will "jump start" the top roadmap priority programs. RDT&E projects include funding for the ECM suite and the integration of the MIL-STD 1760 interface—essential equipment for all the planned advanced conventional weapons. Procurement funds are requested in FY 93 to continue the necessary interim contractor support, continue buying deferred logistic support equipment and carry on with installation of the 1122 ECM antenna.

**B-2:** The B-2 request for FY 93 matches the baseline program. The B-2 will have an inherent military standard 1760 interface. The RDT&E efforts in FY 1993 that directly lead into the roadmap priorities include integration of JDAM I and TSSAM on the B-2.

**Conclusion**

In the B-2, B-1, and B-52 the nation has an unmatched resource for global striking power. The ability to strike our adversaries—and strike hard—without waging a long, potentially contested buildup of forces in theater sets apart the long-range bomber force as a national asset. We must maintain and improve our ability to fight from a distance, both because it may influence the course of a conflict early on, and because we must be able to do battle effectively while shorter range air, land, and sea forces deploy. Bombers, acting autonomously and then in concert with other deployed forces, are capable of making a real difference in the course of a future military clash.

Today we have made the choice to capitalize on the new technological advantages that enhance the bomber's performance in a conventional role. The resources we propose
to spend to integrate advanced conventional capabilities are small in comparison to the potential payoff—and to the costs of other means of putting bombs on target.

The bomber roadmap is a careful appraisal of the size, military potential and cost of the bomber force we will take into the 21st century. As our deployed forces are brought back home, our defense budget shrinks and our global interests become more complex, it is imperative we move past old stereotypes and modify our bombers and our thinking to match the realities of this changing world.