AIR FORCE SPACE COMMAND

STRATEGIC MASTER PLAN
FY06 and Beyond

Strategic Master Plan FY06 and Beyond

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AIR FORCE SPACE COMMAND

1 October 2003

Strategic Master Plan FY06 and Beyond

FOREWORD

Recent conflicts in Afghanistan and Iraq have clearly demonstrated the asymmetric advantage space brings to any fight, whether that fight is in the middle of the desert, isolated mountainous terrain, or a large metropolitan area. Our capabilities from space enable our nation's military forces to deliver decisive force precisely, with minimal collateral damage, while our Intercontinental Ballistic Missile (ICBM) force provides a deterrent effect unmatched by any other country.

However, we cannot rely on our current forces to carry us through the future. New anti-access threats and threats to our military, civil, and commercial space systems are creating new challenges to overcome. In order to continue providing our forces, and those of our allies, the level of support on which they depend, we must modernize our space forces and pursue truly transformational capabilities. Future challenges require that we develop flexible, responsive force projection capabilities to complement our nuclear deterrent force. In short, we must become a full spectrum space combat command.

The Strategic Master Plan (SMP) describes how we will transform this command into a space combat command. It outlines how we will sustain, modernize, divest and transform our forces in order to maximize our warfighting capabilities. This plan is the command's roadmap to ensure our military remains dominant in space, in the air, on the ground and on the sea.

LANCE W. LORD
General, USAF
Commander

AIR FORCE SPACE COMMAND

1 October 2003

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1 Introduction

1.1 PURPOSE

Air Force Space Command (AFSPC) develops the Strategic Master Plan (SMP) as the capstone document of the command's Integrated Planning Process (IPP). The SMP presents the AFSPC Vision, outlines a strategy to implement that Vision, and defines a 25-year plan. That plan is integrated across the AFSPC mission areas to provide the space capabilities required to achieve the Vision.

The SMP presents the AFSPC Vision, outlines a strategy to implement this Vision, and defines a 25-year plan … to achieve the Vision.

During the IPP, AFSPC works to produce a fiscally and technologically feasible SMP and develops products to provide programming and budgeting guidance for AFSPC organizations and Air Force Materiel Command (AFMC) product centers and research laboratories. The SMP also serves as the foundation for our inputs to Air Staff planning and programming activities.

1.2 BACKGROUND

Our space systems and capabilities have become key to our nation's military effectiveness. Without them, our military forces would not enjoy many of the advantages we currently have over our adversaries. Air Force Doctrine Document (AFDD) 2-2, "Space Operations," emphasizes the importance of space.

> *Just as the advent of airpower greatly enhanced military operations of the time, space forces, likewise, greatly enhance modern military operations across the spectrum of conflict.*
>
> *Air Force doctrine views air, space, and information as key ingredients for dominating the battlespace and ensuring superiority.*
>
> *Effective use of space-based resources provides a continual and global presence over key areas of the world … satellites permanently "forward deployed" add another dimension to the capability of our force's ability to quickly position themselves for employment.*
>
> *Military forces have always viewed the "high ground" position as one of dominance and warfare advantage. With rare exception, whoever owned the high ground owned the fight.*
>
> *This capability (Space) is the ultimate high ground of US military operations.*
>
> *Today, control of this high ground means superiority in information and significant force enhancement. Tomorrow, ownership may mean instant engagement anywhere in the world.*
>
> *Planners should consider integrating future development capabilities, such as the capability to deliver attacks from space, into the campaign plan when determining how best to strike adversary Centers of Gravity (COG). Space force application systems would have the advantages of rapid global access and the ability to effectively bypass adversary defenses.*

It is AFSPC's responsibility to organize, train, and equip our space and missile forces by developing, acquiring, fielding, operating, and sustaining systems and capabilities to exploit and control the high ground of space. A "capability" is the union of doctrine, organization, training, materiel, logistics, personnel, and facilities (DOTMLPF) that enables a force to execute a specified course of action. AFSPC already operates significant space and missile systems and a large supporting infrastructure in operation. To help understand these systems and their complexities and to facilitate its role to organize, train, and equip, AFSPC has organized these capabilities, based on the functions they perform, into four mission areas and one mission support area, as shown in Figure 1-1. This construct will be used throughout the SMP to present AFSPC's plan to more fully exploit and control space.

- **Space Force Enhancement (SFE)**
  - **Capabilities that contribute to maximizing the effectiveness of military air, land, sea, and space operations**
- **Counterspace (CS)**
  - **Capabilities to attain and maintain a desired degree of space superiority by allowing friendly forces to exploit space capabilities while negating an adversary's ability to do the same**
- **Space Force Application (SFA)**
  - **Capabilities to execute missions with weapons systems operating from or through space which hold terrestrial targets at risk**
- **Space Support (SS)**
  - **Capabilities to provide critical launch and satellite control infrastructure, capabilities and technologies that enable the other mission areas to effectively perform their missions**
- **Mission Support (MS)**
  - **Functional areas that cut across all mission areas and provide the required infrastructure**

Figure 1-1: AFSPC Mission Areas and Mission Support

1.3 SMP OVERVIEW

As with any plan, the SMP should be viewed as a guide to future actions and not a recipe to be strictly followed. In the next chapter, the SMP presents AFSPC's vision by briefly describing AFSPC today, where AFSPC wants to be in 25 years, the basic strategy to get there and our major thrusts to sustain, modernize and transform our capabilities. Chapter 3 then presents AFSPC's plan to implement its vision, with Chapter 4 illustrating the fiscally constrained results for this planning cycle. Chapter 5 addresses specific mission area issues, with the last chapter describing the way ahead and some of the implementation challenges AFSPC may face. The approved results of each phase of the IPP can be found in Appendix C.

2 AFSPC Vision

The AFSPC vision looks 25 years into the future:

Figure 2-1: AFSPC Vision

- "Full Spectrum" means a command fully capable of performing its roles as an Air Force Major Command (MAJCOM) to organize, train and equip, as a warfighting component to United States Strategic Command (USSTRATCOM) and in support of the Executive Agent for space by:

- Developing space professionals capable of intellectual / conceptual breakthroughs

- Providing the capabilities and Command and Control (C2) to deliver warfighting effects

- Accelerating and enhancing the technology-to-warfighting cycle

- "Space Combat Command" means the command has significant Counterspace (CS), Space Force Application (SFA) and information operations capabilities to present to the Joint Force Commander in addition to the traditional capabilities of Space Force Enhancement (SFE) and Space Support (SS). These capabilities will be presented to the theater Joint Force Commander through USSTRATCOM, though retaining the ability to work directly with the Commander Air Force Forces (COMAFFOR).

- "Preeminent in the application of space power to national security and joint warfare" means a command that is recognized as having the world's experts in all assigned systems and in the application of space power during peacetime, crisis and war.

Commanding the Future

AFSPC is executing an initiative titled "Commanding the Future" to further implement its vision. This initiative consists of seven "Thrust Areas" which focus the command's transformation efforts on those areas that will help make the command a full-spectrum space combat command. The "Commanding the Future" effort supports the IPP and SMP by expanding on the Commander's Intent and defining the command's vision for the future, further identifying the command's partners, and creating "wizards" (space experts) who can help develop strategic guidance. In turn, the IPP and SMP support the initiative by outlining an acquisition strategy that emphasizes warfighter value per dollar spent and integration with other agencies and Services, providing information AFSPC's partners require, outlining education and training initiatives that will aid the unleashing of human talent in the command, and reinforcing the AFSPC's warfighter focus by describing how the Command will acquire the warfighting component capabilities it requires to support USSTRATCOM.

Implementing this vision requires an understanding of where AFSPC is today as well as a look at how the military environment may change in the future. With this understanding we can envision how AFSPC's future force can contribute to the nation's warfighting team. This future vision will, in turn, allow us to make wise sustainment, modernization, and transformation decisions to achieve that desired end state.

2.1 AFSPC TODAY

Today, AFSPC serves as a force provider, operating the Intercontinental Ballistic Missile (ICBM) portion of the nation's strategic nuclear deterrent forces and as a force enabler to conventional forces. From Desert Storm to recent operations in Afghanistan and Operation Iraqi Freedom, military operations depend increasingly on space capabilities as force multipliers. Many of our space systems that are critical to the warfighter fall largely within the SFE mission area, primarily filling supporting roles with communications, positioning and timing, missile warning, and environment monitoring (EM) integrated into all aspects of military operations. Information collected from and disseminated through space, as well as the timely and tailored presentation of intelligence from and for space systems, is crucial to monitoring situations and status of forces worldwide, developing courses of action, and determining and engaging targets. AFSPC's space and missile capabilities also are integral to our ability to accomplish precision attacks from standoff locations and allow combatant commanders to "shorten the kill chain." Flowing through United States (US) space forces, key information is sent directly to the battlefield, providing location data to Global Positioning System (GPS) receivers in tanks, messages to hardened portable computers with the troops and satellite images to weather stations set up on the front lines.

Space capabilities have become essential to military operations, worldwide commerce and everyday life. Under a constant deluge of evolving technologies, traditional military, national and commercial capabilities in space are rapidly converging. Today, space capabilities previously accessible only to military and government users are available to almost anyone able to purchase them. For example, GPS has been integrated into military and civil applications ranging from precision weapons to rental cars. Satellite Communications (SATCOM) and space imaging continue to experience growth dominated by the commercial sector. This growth is placing increased demands on military launch resources, satellite operations, and space situation awareness (SSA) assets to effectively deploy, manage, and protect these capabilities as well as understand the threats posed by potential adversaries.

2.2 CHANGING ENVIRONMENT

Our ability to provide these supporting space capabilities to the warfighter depends on our ability to control space. To date, we control space and our access to space has been unchallenged. Additionally, the modernization of our ICBMs and other elements of the Strategic Triad will continue to provide the deterrent underpinnings so important to our nation's National Security Strategy.

While the US does not expect to face a global military peer in the next several decades, the Nuclear Posture Review (NPR) postulates rogue states or "states of concern" could provide a challenge to classical cold war deterrence. In addition, we must contend with non-state actors and terrorists who may acquire a "loose nuke" or a so-called "dirty bomb." To deter aggression in this new security environment, the US must possess credible capabilities to project military power and conduct rapid combat operations with a high probability of success across the spectrum of conflict.

A viable, prompt global strike capability, whether nuclear or non-nuclear, will allow the US to rapidly and accurately strike distant high-payoff, difficult-to-defeat targets. This capability provides the US with the flexibility to employ innovative strategies to counter adversary anti-access and area denial strategies. Such a capability will provide warfighting commanders the ability to rapidly deny, delay, deceive, disrupt, destroy, exploit, and neutralize targets in hours/minutes, even when US and allied forces have a limited forward presence. Thus, prompt global strike space capabilities will provide the President, Secretary of Defense, and warfighting commanders with flexible options to deter, or defeat, most threats in a dynamic security environment.

Equally important, we cannot expect to continue to have unchallenged access to our space capabilities. We must be prepared to protect our access to and operations in space. An operationally responsive spacelift capability is critical to place timely missions on orbit assuring our access to space. Additionally, the convergence of military, national and commercial space capabilities generates new challenges to protect our space systems, to capitalize on potential efficiencies in space capabilities and to create new partnerships. Space capabilities are proliferating internationally, a trend that can reduce the advantages we currently enjoy. For example, the European Galileo network of navigation satellites will provide capabilities comparable to our GPS network; however, we will have no control over who has access to the Galileo signal or the accuracies provided. The Galileo network could degrade US GPS signals and cause a downturn in GPS manufacturer refinements.

The benefits we derive from space assets are so pervasive that we depend on space capabilities often without realizing it. Our increasing reliance and dependency also creates vulnerabilities. US space dependency is not lost on our adversaries, making our position vulnerable to threats that could, in turn, affect our capabilities.

Current space oriented threats can be found in the following classified documents: *Interim Space Capstone Threat Capabilities Assessment* (NAIC-1564-0727-03 dated July 2003); *Threats to US Space Systems and Operations Over the Next Ten Years* (NIC-ICB 2003-09C dated February 2003). Based on these and other documents, three key judgments that lend insight to the future access to and threats in space are:

- The US military depends on national and commercial space systems of both domestic and foreign (or international consortia) origin. Offensive operations to disrupt or deny access to these systems could seriously affect US warfighting capabilities.

- Space systems are potentially susceptible to offensive counterspace (OCS) operations

- Potential adversaries could challenge US access to space by taking advantage of a range of OCS capabilities within their technological means. These offensive capabilities could include: denial and deception, ground station attack and sabotage, electronic attack, and direct attack on the satellites themselves.

Finally, as commercial space capabilities mature, many areas may be useful to the military. However, the core or distinctive capabilities must remain as military capabilities while limited needs may be satisfied through the purchase of services or partnering with civil and commercial entities. Effective military use of civil and commercial space capabilities will require new partnerships and understanding of commercial and consortia capabilities and operating constraints. These may lead to new policies for sharing civil and commercial space information.

2.3 AFSPC TOMORROW

As we implement our vision to fully exploit space as a space combat command, AFSPC will become a significant *force provider* of CS, conventional and strategic prompt global strike capabilities with even greater *force enabler* capabilities. As depicted in Figure 2-2, our space capabilities are built upon a structure where the uppermost portions of SFE and SFA depend on a solid foundation. While our ultimate goals are truly to "exploit" space through SFE and SFA missions, as with other mediums, we cannot fully "exploit" that medium until we first "control" it. The needed foundation, therefore, consists of the assured space access and infrastructure provided by the SS and MS areas along with the CS capabilities (SSA, Defensive Counterspace (DCS), and OCS) required to control space and ensure Space Superiority.

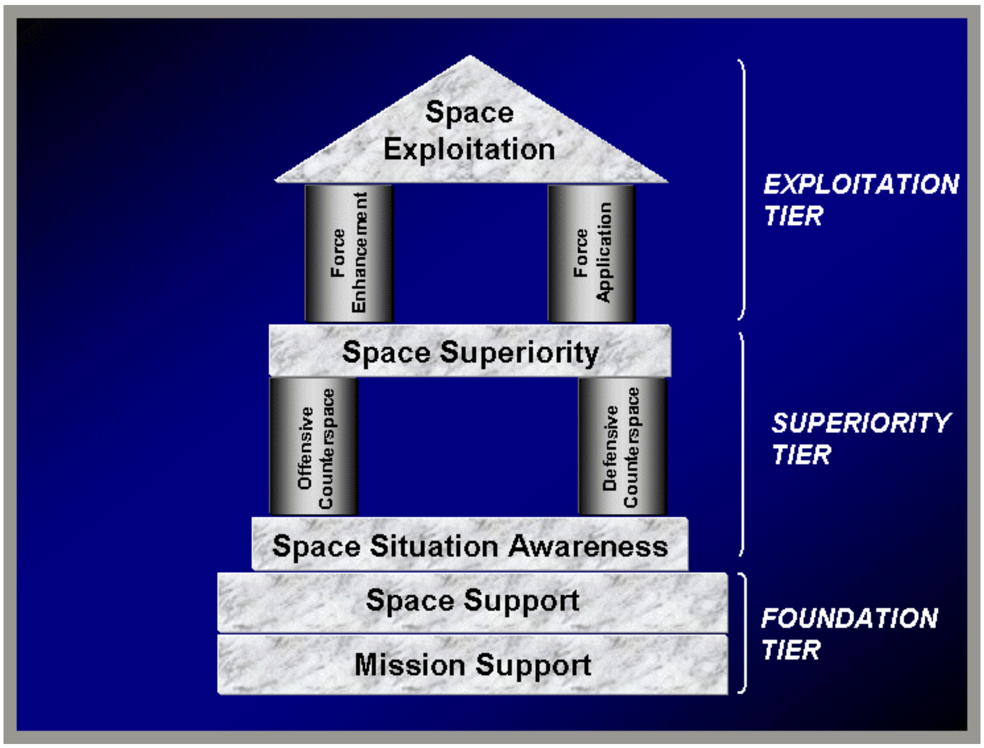

Figure 2-2: Military Space Power Construct

Currently, our use and control of space has essentially gone unchallenged, allowing us to focus largely on SFE to support the warfighter. This "default space control" will not continue in the future as potential adversaries come to better understand the great advantages our space capabilities provide us and recognize how our increasing dependence on space represents a vulnerability they need to exploit.

Our challenge, as we move into the future, is to strengthen the base of the pillar of space capabilities with operationally responsive spacelift, robust launch, satellite control, SSA, and infrastructure along with the supporting elements of OCS and Defensive Counterspace (DCS) to ensure continued control of space. This will enable us to more fully exploit space through improved SFE and SFA capabilities.

3 The Planning Process

3.1 PROCESS

AFSPC uses an IPP to develop its 25-year strategy. This capabilities-based process allows the command to identify needed capabilities, determine shortfalls that must be filled through modernization and transformation, and develop a fiscally and technologically achievable investment plan to achieve its long-term vision.

During the Integrated Planning Process, AFSPC performs the following four steps, as illustrated in Figure 3-1:

- Mission Area Assessment (MAA): A strategy-to-task analysis of the capabilities AFSPC must provide in order to accomplish its assigned missions. A comprehensive collection of national, Department of Defense (DoD), and Service guidance documents, including the Air Force Capabilities Concept of Operations (CONOPs), are used to develop the set of specific tasks the command must perform. These tasks are prioritized and quantified to form the basis of the IPP.

- Mission Needs Analysis (MNA): A needs analysis that identifies shortfalls in the command's programmed and planned capabilities. These shortfalls pinpoint requirements for new systems concepts (to provide needed capabilities) as well as provide guidance to the Science and Technology (S&T) community on what new technologies need to be developed.

- Mission Solutions Analysis (MSA): A development of improved or new concepts that can satisfy the shortfalls identified in MNA. These concepts reflect both fiscal and technological realities in order to provide executable options for the command.

- Integrated Investment Analysis (IIA): A model- and analysis-based development of an integrated investment plan that maximizes military value in a fiscally constrained, technologically achievable way.

USAF Capabilities CONOPS and the
AFSPC Strategic Master Plan

The Chief of Staff has directed the Air Force to develop a Concept of Operations (CONOPS)-based approach to develop the capabilities the service needs to accomplish its missions and to evaluate its progress towards that end. These "Capabilities CONOPS" were developed during the AFSPC IPP, which predate the Capabilities CONOPS language, and do not use the same terminology as the Air Force effort. However, AFSPC has been careful to ensure the capabilities required by the CONOPS are included in its plan, and these capabilities form the basis for both MAA and MNA. AFSPC can map each Air Force–wide capability to an equivalent capability or set of capabilities in the Strategic Master Plan. See Appendix D for Capabilities CONOPS linkage

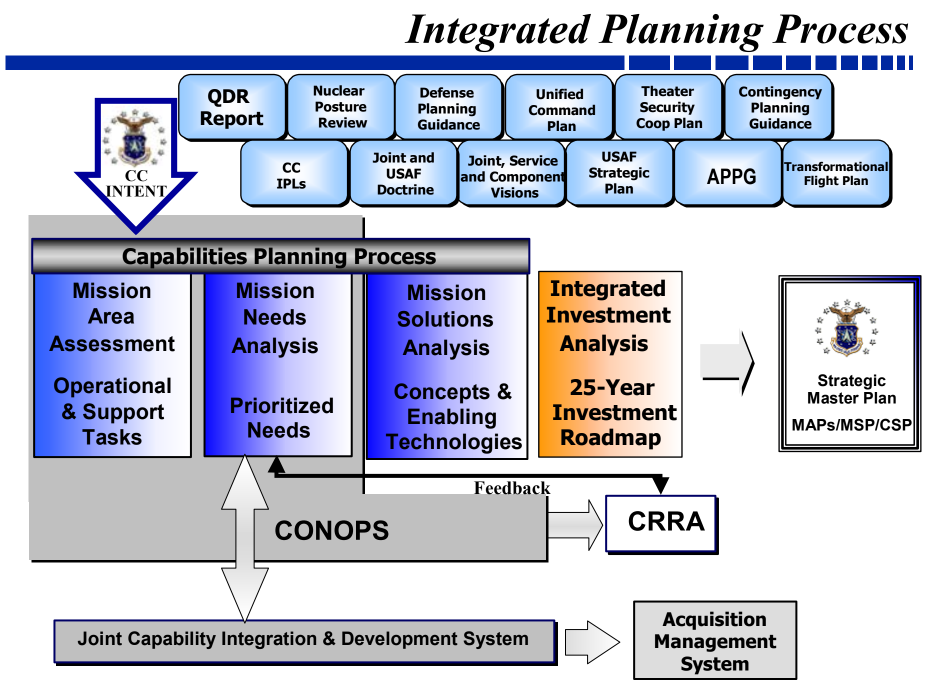

Figure 3-1: Integrated Planning Process

3.2 IMPLEMENTATION

This goal–attaining the command vision of a Space Combat Command–will require a phased approach. We will implement these capabilities across the planning horizon through the Near–(FY06 – 11), Mid–(FY12 – 17), and Far–(FY18 – 30) Term. AFSPC's strategy is to transform AFSPC into a full spectrum space combat command. We will organize, train and equip space and missile forces to provide the President with a range of options to deter and defeat aggression or any form of coercion against the US, our allies, or our friends.

AFSPC will focus on people, capabilities and effects. Our cadre of space professionals will integrate and employ our unique capabilities at the right place, at the right time and with the desired effects to prevail over any adversary.

Our charter is to rapidly obtain and maintain space superiority and the space, nuclear, and conventional strike capabilities that produce desired warfighting effects. This requires a fundamental shift in our thinking. Instead of focusing on the force enhancement role of our space systems and the deterrence role of our nuclear and conventional forces, we must also pursue the ability to apply conventional combat in, from, and through space. We will aggressively modernize our existing nuclear forces and pursue a follow-on system while developing a flexible and responsive global deterrent force.

In support of the Air Force's Executive Agent for Space role, we advocate space capabilities and systems for all services. Together we provide the space capabilities our nation requires today and into the future. Some of these capabilities are prompt global strike, predictive battlespace awareness and targeting-quality information, SSA, OCS, and DCS. These capabilities will also provide critical support to our nation's missile defense efforts.

Counterspace Planning:
The IPP Pathfinder

This cycle, AFSPC tested an advanced planning process (IPP Pathfinder or IP3) to increase the rigor of its analysis in the CS mission area. This test program used more detailed concept analysis, architecture processes, and military utility analysis (including warfighting scenario modeling) to determine and evaluate CS investment options. The result was a proposed CS investment strategy that integrates SSA, DCS, and OCS while showing the architecture's utility in warfighting terms (e.g., decrease in blue force attrition).

3.2.1 NEAR-TERM (FY06-11)

In the Near-Term, AFSPC will continue to produce a cadre of space experts -- fluent in land, sea, air and space power missions-who will seamlessly integrate space capabilities into military operations. AFSPC will also forge strong co-operative partnerships with other military services and national Security Space partners to allow us to maximize limited resources and focus technology development. This will enhance our ability to rapidly develop and field transformational warfighter and space capabilities. AFSPC will target its investments to:

- Organize, train, and equip with the right people and resources to maximize their effect
- Modernize our ICBM force
- Field planned threat indicators and warning, secure and protected communications, global navigation, and predictive battlespace awareness capabilities
- Build the foundation for our CS mission by procuring new SSA, DCS and characterization and reporting capabilities and fielding a space range capability
- Integrate and improve the ability to seamlessly C2 space forces in any theater of operations Initiate work on offensive CS, non-nuclear prompt global strike and targeting-quality intelligence, surveillance, and reconnaissance (ISR) capabilities;
- Develop technologies to increase standardization of spacecraft design and operations, to facilitate spiral development, and to field "technologies that provide revolutionary capabilities in communications, propulsion, conventional and nuclear strike, C2, and operations

This strategy translates into a high prioritization of space force enhancement transformation efforts to maximize support to the warfighter. Also of high importance are C2 of space forces and routine spacelift-both essential capabilities to the conduct of space operations. Finally, nuclear deterrence/strike, defensive counter space, and SSA capabilities will be emphasized along with initial work on OCS and responsive spacelift. This will set the stage for fielding of space combat capabilities in the Mid- and Far-Term.

AFSPC will continue to refine and reprioritize our schedules, initiatives and requirements to deliver a higher level of sustained space and missile capability to engage evolving world threats to our national security.

3.2.2 MID-TERM (FY12--17)

In the Mid-Term, AFSPC will deploy a new generation of responsive space access, prompt global strike, and space superiority capabilities. Our Weapons Officers and other space professionals will integrate and operate these capabilities into joint and task force operations. In practical terms, AFSPC will continue to prioritize efforts that support SFE transformation to include Transformational Communications and space-based Ground Moving Target Indicator (GMTI) capabilities. Responsive spacelift capabilities become more important in this timeframe due to their support of both Global Strike and DCS (Responsive replenishment of space assets). Such work will increase support to the terrestrial warfighter while protecting US space assets and demonstrating space combat capabilities. Mid-Term targeted investments will include:

- Complete fielding planned ISR and communications capabilities
- Field Transformational Communications
- Deploy a Space-Based GMTI and Synthetic Aperture Radar (SAR) capability
- Deploy capabilities to improve integration between space and terrestrial ISR
- Develop and field contingency non-nuclear prompt global strike capabilities and assured access, responsive launch capabilities
- Finalize development and begin deployment of a follow-on ICBM Force
- Continue adding incremental improvements to our DCS and SSA capabilities while finalizing development of OCS capabilities
- Field a research and development (R&D) spacecraft program to increase the quality and quantity of DoD experiments flown in space. Begin migration to a standardized spacecraft for small payloads.

Integrating fielded SFE systems with complementary terrestrial systems will allow military forces to maximize their situation awareness at a reduced cost. This operational synergy allows us to pursue a cost-effective sustainment strategy, accept development risk in some force enhancement capabilities, and position the command for the Far-Term

3.2.3 FAR-TERM (FY18--30)

In the Far-Term, AFSPC will target resources toward fielding and deploying space and missile combat forces in depth, allowing us to take the fight to any adversary in, from, and through space, on-demand. Based on previous development efforts, AFSPC will focus on Battlespace Awareness (space and terrestrial), OCS and DCS, and prompt global strike and LBSD capabilities. Many of these will be supported by responsive spacelift and payload capabilities. We will continue to explore advanced technologies to revolutionize and transform our operations beyond 2025. The result will be a space combat command that is organized, trained, and equipped to rapidly achieve decisive results on or above the battlefield, anywhere, anytime.

4 Analysis

4.1 OVERVIEW

AFSPC conducted extensive analysis to determine the best mix of forces providing the highest military utility with respect to our projected Total Obligation Authority (TOA). Eighty-five potential portfolio cases were examined. Ultimately the Integrated Investment Analysis (IIA) team narrowed the focus to three cases: the first to display the commander's intent, the second to display AFSPC Modernization driven to the TOA, and the third a realistic, flexible, cost constrained planning picture. For each case, Space Command's Optimization of Utility Tool (SCOUT) produced several optimized solutions. The Mission Area Teams (MATs) reviewed 627 proposed solutions and removed the unacceptable ones, then focused on the best solution for the three final cases.

4.2 ANALYSIS BASELINE

The analysis producing AFSPC's 25-year SMP involved over a year of detailed analysis of needed capabilities, shortfall, possible solutions, and investment options. It used the following assumptions.

- Available planning would increase TOA at approximately 3% per year in real growth starting in Fiscal Year (FY)10 (after the current Future Years Defense Plan - FYDP). Although we expect relatively austere military funding in the future, the importance of space capabilities to the warfighting effort indicates that space TOA will increase slightly each year.
- Mandated follow-ons must be funded to ensure no gaps in current capabilities. In other words, AFSPC must continue to provide essential services (communications, missile warning, positioning and timing, nuclear deterrence, etc.) without gaps to the warfighter.
- MS must be adequately funded. Investment analysis usually focuses on major acquisitions, but MS (logistics, training, security, etc.) must also be invested in.

4.3 ANALYSIS RESULTS

4.3.1 CASE 1

This cycle AFSPC investigated three major cases in its analysis. The first case depicts what resources would be required to acquire all the capabilities for which AFSPC is responsible in the timeframes desired by the warfighter. Shown in Figure 4-1, it is apparent the AFSPC TOA is inadequate. Driven by the high cost of major acquisitions for operationally responsive spacelift (ORS) and follow-on land based strategic deterrent (LBSD), this case is un-executable. It does, however, point out the drivers for AFSPC investment.

Note: The attached sand charts depict each mission area total with two exceptions: SS has Space Operations Vehicle (SOV) broken out and SFA has LBSD broken out.

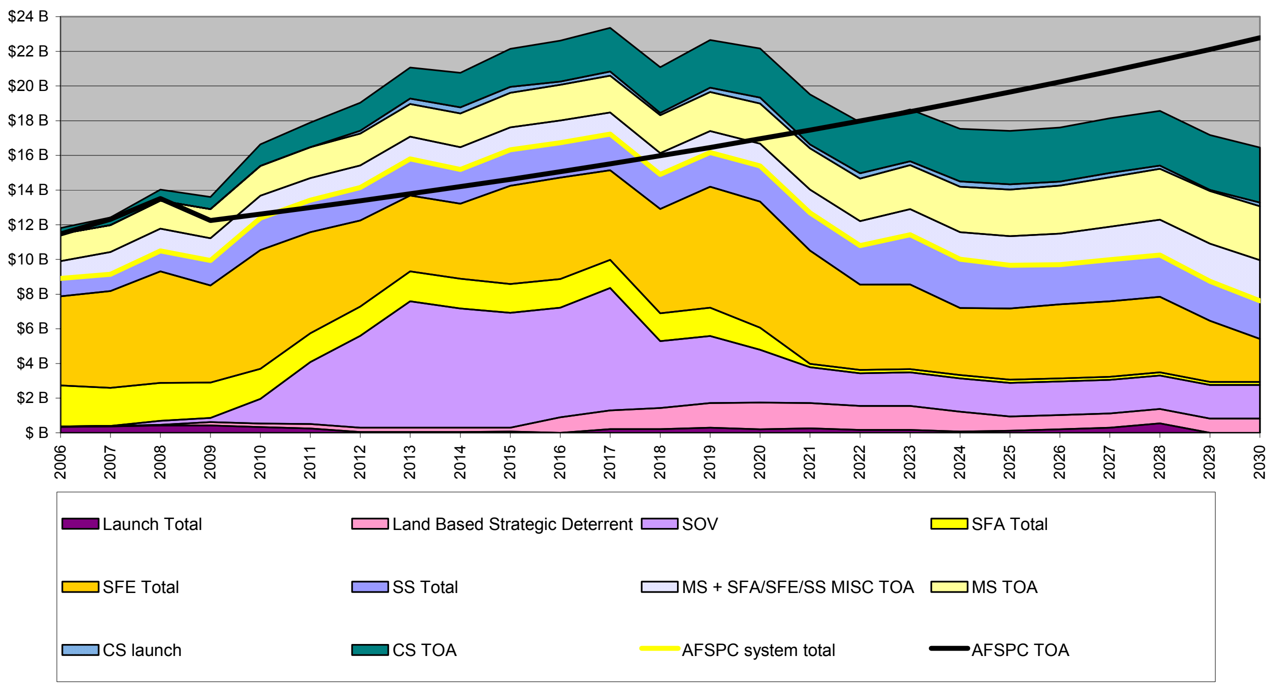

Figure 4-1: Case 1

4.3.2 CASE 2

The second case, shown in Figure 4-2, emphasizes fiscal constraints by requiring AFSPC TOA to remain under the planning assumptions. It is executable, but requires slipping both ORS and LBSD significantly past their required operational dates. This would cause major shortfalls in these two very high priority capabilities and would, in the case of LBSD, create a gap in the nation's land-based nuclear deterrence capability (as the current nuclear deterrent system, Minuteman III, cannot be extended to the delayed LBSD availability).

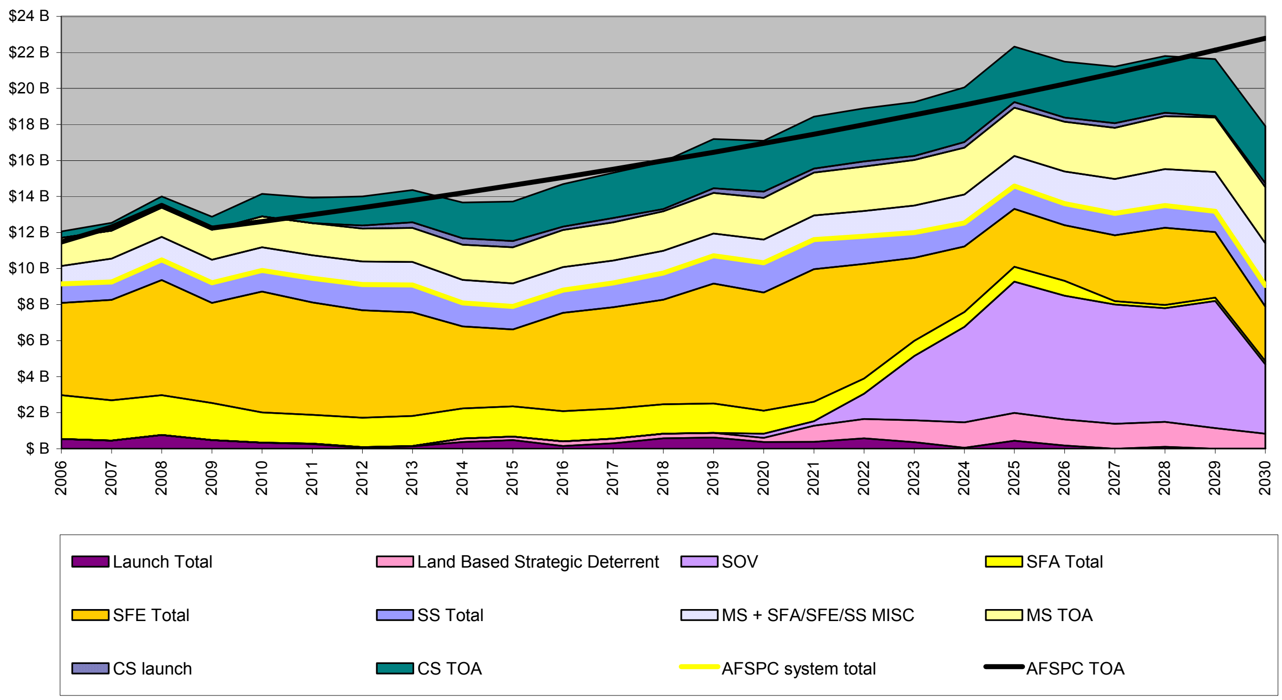

Figure 4-2: Case 2

4.3.3 CASE 3

The third case, which relaxes some TOA constraints, is shown in Figure 4-3. It allows both the timely fielding of LBSD and increases the capabilities of the entire space portfolio. However, it does not provide for ORS when it is required. Further analysis indicates that purchasing ORS "on time" would delay fielding many capabilities that, while individually less important, provide in aggregate more military value than ORS. These systems include Minuteman III sustainment through 2020, LBSD, Prompt Global Strike, space-based GMTI and SAR, and Transformational Communications Satellite replenishment.

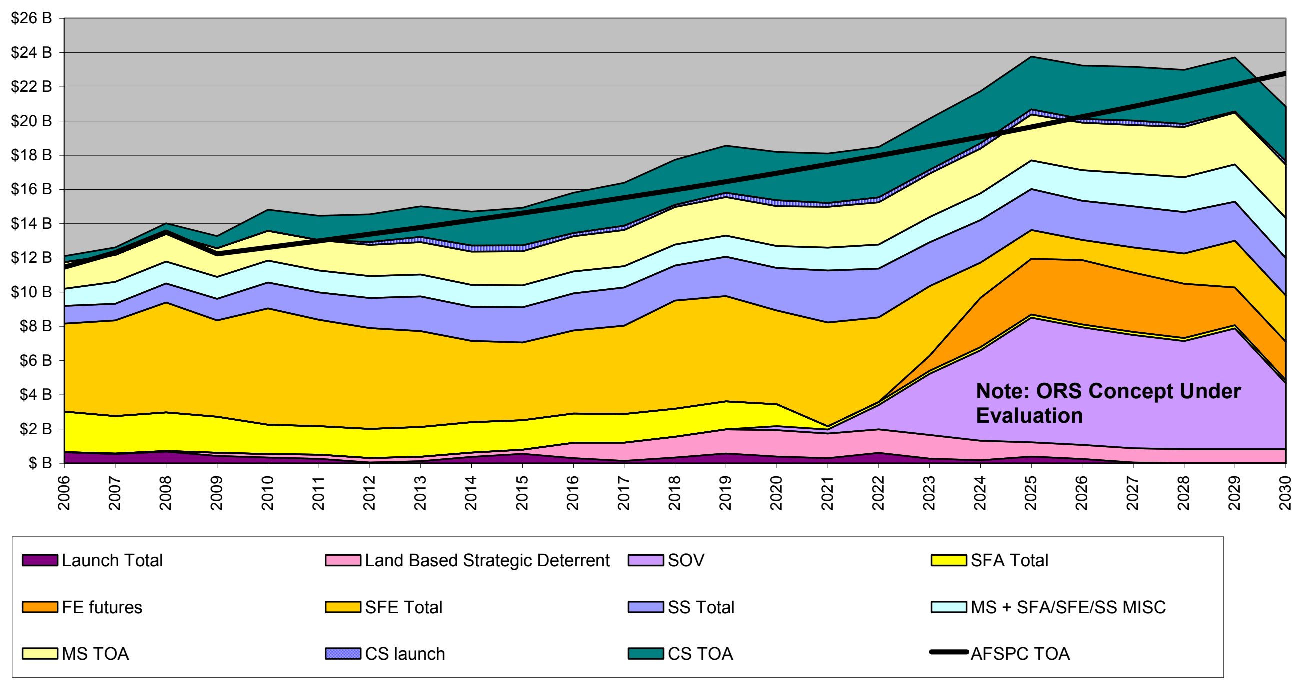

Figure 4-3: Case 3

4.4 THE PLAN

AFSPC has determined that a long-term plan following the Case 3 construct is the most useful to influence the programming, requirements and technology efforts. This plan, with the exception of its inability to provide operationally responsive spacelift in a timely manner, is the best mix of cost constraint and capability. It should, however, be viewed as a guide to future action as opposed to a recipe to be strictly followed. The results are detailed by mission area in the following section.

The primary problem during the development of a fiscally constrained, operationally supportive plan was the large cost profiles of the LBSD and ORS concepts. AFSPC will investigate and implement the following initiatives to alleviate this in the next planning cycle:

- Cost Profile: Aggressively prepare an executable funding profile for both LBSD and ORS ASAP.

- Spiral Development: The LBSD and ORS concepts did not include spiral development, which could stretch out and reduce their costs. Analyses of Alternatives (AoAs) for these capabilities are underway and should provide more executable acquisition plans for these systems.

- Cost Sharing: AFSPC has collaborative and co-operative planning efforts across the DoD, National Reconnaissance Office (NRO) and National Aeronautics and Space Administration (NASA). These efforts will be used to determine cost-sharing opportunities for capabilities (such as ORS) that benefit multiple organizations.

- Divestiture: During the programming cycle AFSPC will investigate options to divest current programs linked to lower priority capabilities to provide additional funding for transformational capabilities.

- Additional funding: Space capabilities provide value beyond their cost through their transformational nature. AFSPC will investigate options in obtaining additional funding during the budget cycle.

5 Mission Areas

Though the IPP results in a plan integrated across the mission areas, we present the plan here by mission area to show the progression from current to future capabilities. Figure 5-1 lists the mission areas and their related sub-missions along with the MS functional areas.

Space Force Enhancement (SFE)
- Positioning, Navigation and Timing (PNT)
- Satellite Communications (SATCOM)
- Environmental Monitoring (EM)
- Intelligence, reconnaissance, and surveillance (ISR)
- Command and Control (C2)

Counterspace (CS)
- Space Situation Awareness (SSA)
- Defensive Counterspace (DCS)
- Offensive Counterspace (OCS)

Space Force Application (SFA)
- Nuclear Deterrence
- Missile Defense
- Conventional Strike
- Counterair

Space Support (SS)
- Launch Operations
- Satellite Operations
- And advocate for
  - Modeling, Simulation, and Analysis (MS&A)
  - Force Development Evaluation (FDE)

Mission Support (MS)
- Communications and Information (C&I)
- Civil Engineering
- Logistics
- Security Forces
- Space Training, Education, and Exercise (STEDE)
- Medical

Figure 5-1: Mission and Sub-mission Areas

For each mission area we briefly outline current capabilities and then present a rolled-up investment roadmap highlighting our plan to *sustain* and *modernize* these capabilities while we *transform* space capabilities to achieve our vision. We provide a top-level assessment of how well the plan satisfies the needs identified for the mission area and the Air Force capabilities. (Refer to the appropriate Mission Area Plan (MAP) or Mission Support Plan (MSP) (Appendix H--M) for a full list of defined needs, and a higher fidelity roadmap than presented here.)

5.1 SPACE FORCE ENHANCEMENT (SFE)

5.1.1 CURRENT AND PROGRAMMED CAPABILITIES

The SFE mission area provides combat support operations to improve military forces effectiveness. SFE currently provides the capabilities to gather and disseminate timely and highly accurate information. The US military has become extremely reliant on our SFE capabilities. For example, our current space-based navigation system, GPS, provides highly reliable and accurate positioning, navigation, and timing (PNT) information that has become integral to the full military operations spectrum, from basic navigation and communications synchronization to precision weapons basing, targeting, and terminal guidance. Our SATCOM systems (Defense Satellite Communications System (DSCS), Global Broadcast System (GBS) and Milstar) provide military forces with the near-global, high-capacity voice, data, and video communications links essential to successful military operations. Weather satellites, including Defense Meteorological Satellite Program (DMSP) satellites, along with terrestrial and space environment sensors, provide battlespace environment forecasts vital to operational planners.

Defense Support Program (DSP) and ground radar stations, coupled with C2 capabilities within Cheyenne Mountain support NORAD and USSTRATCOM in processing the missile warning sensor info and providing the information to strategic and tactical missile warning.

5.1.2 PLAN OBJECTIVES

The SFE mission area will continue to lead the world in supporting air, ground, and naval forces from space, with precise and highly reliable PNT, reliable high-capacity communications, space and terrestrial EM, and strategic and tactical missile warning. AFSPC will ensure all new satellite constellation architectures provide responsive, assured mission data capability sufficient to execute wartime plans. We will transform SATCOM to provide network-centric, high-capacity communications. We will develop transformational advancements in our ability to task, collect, process, exploit, and disseminate ISR fully integrated with air, ground, and naval forces. Our superior C2 systems will allow us to shape the battlespace, take instigative actions, and react to developing situations. Figure 5-2 highlights AFSPC's time-phased SFE mission area roadmap.

5.1.3 SUSTAIN AND MODERNIZE

AFSPC will sustain its current navigation and timing, missile warning, environmental monitoring, and C2 systems that support our military forces. We will work through the Near- and Mid-Term to modernize mature and aging capabilities by replacing and upgrading our current systems. The following is how we will sustain and modernize SFE capabilities:

- ISR: AFSPC will ensure an uninterrupted and modernized missile launch warning capability by sustaining the DSP program, fielding the Space-Based Infrared System (SBIRS), and ensuring that adequate upgrades to the ground–based radars (GBRs) are preformed to extend their system life.

- EM: We will continue to support current capabilities, while we overcome existing and future deficiencies to meet the evolving future military operations requirements. The replacement of DMSP by National Polar-orbiting Operational Environmental Satellite System (NPOESS) and its follow-on systems maintains and improves our ability to monitor the terrestrial environment to meet global and theater weather forecasting needs. We are pursuing several systems to greatly improve our ability to monitor and characterize the space environment, supporting the counter-space mission.

- SATCOM: In the Near-Term, we will ensure SATCOM users have uninterrupted communications capability, while greatly increasing overall communications capacity. DSCS and Milstar will be replaced with Wideband Gapfiller System (WGS), Advanced Extremely High Frequency (AEHF), and Transformational Satellite Communications System (TSAT). Similarly, Interim Polar system will be replaced with Advanced Polar System (APS). We will equip our forces with the family of advanced beyond line of sight terminals (FAB-T) and ground multi-band terminal (GMT) which will bring transformational communication to the battlefield.

- PNT: AFSPC will provide a secure, survivable, and resilient navigation and timing capability to provide highly accurate data to friendly users through all conflict levels. We will replace GPS IIA and IIR satellites with GPS IIRM, IIF, and III to sustain current capabilities and to add improvements such as a Navigation Warfare (NAVWAR) capability to protect GPS use by the US and its allies while denying use to our enemies.

- C2: AFSPC will develop and field a world class C2 system, providing commanders the ability to quickly and effectively monitor, assess worldwide events and plan and execute space forces. The evolutionary development of the Combatant Commanders Integrated C2 System (CCIC2S) will integrate the C2 capabilities for all the current and projected NORAD mission and USSTRATCOM space operations and missile defense missions into a single functional system rather than the current mission-unique, "stove-piped," collection of systems.

5.1.4 TRANSFORM

In addition to evolving current capabilities, we will transform some of our SFE capabilities to meet new threats and greatly expanded SATCOM demands. We will:

- Field a Space-Based Radar (SBR) Ground Moving Target Indicator (GMTI) and Synthetic Aperture Radar (SAR) capability to provide worldwide persistent global situational awareness.

- Development and field Chemical, Biological, Radiological, Nuclear, and High Explosive (CBRNE) detection capability though a space-based Hyperspectral Imaging (HSI) system.

- Transform SATCOM from a set of stand-alone systems specifically developed for particular users to an integrated, network-centric SATCOM system architecture under the guidance of the Transformational Communication Architecture (TCA). AEHF, APS, and TSAT will be cross-linked to form an integrated network-centric system-of-systems for wideband and protected users, significantly increasing SATCOM's capacity and utility. High data rate terminals will link platforms and satellites.

- Ensure vital SFE capabilities are available to the warfighter by pursuing transformational capabilities such as: payloads ready to launch on demand, the capability for them to be transferred to necessary orbits, and the capability to be serviced on-orbit servicing spacecraft for life extension.

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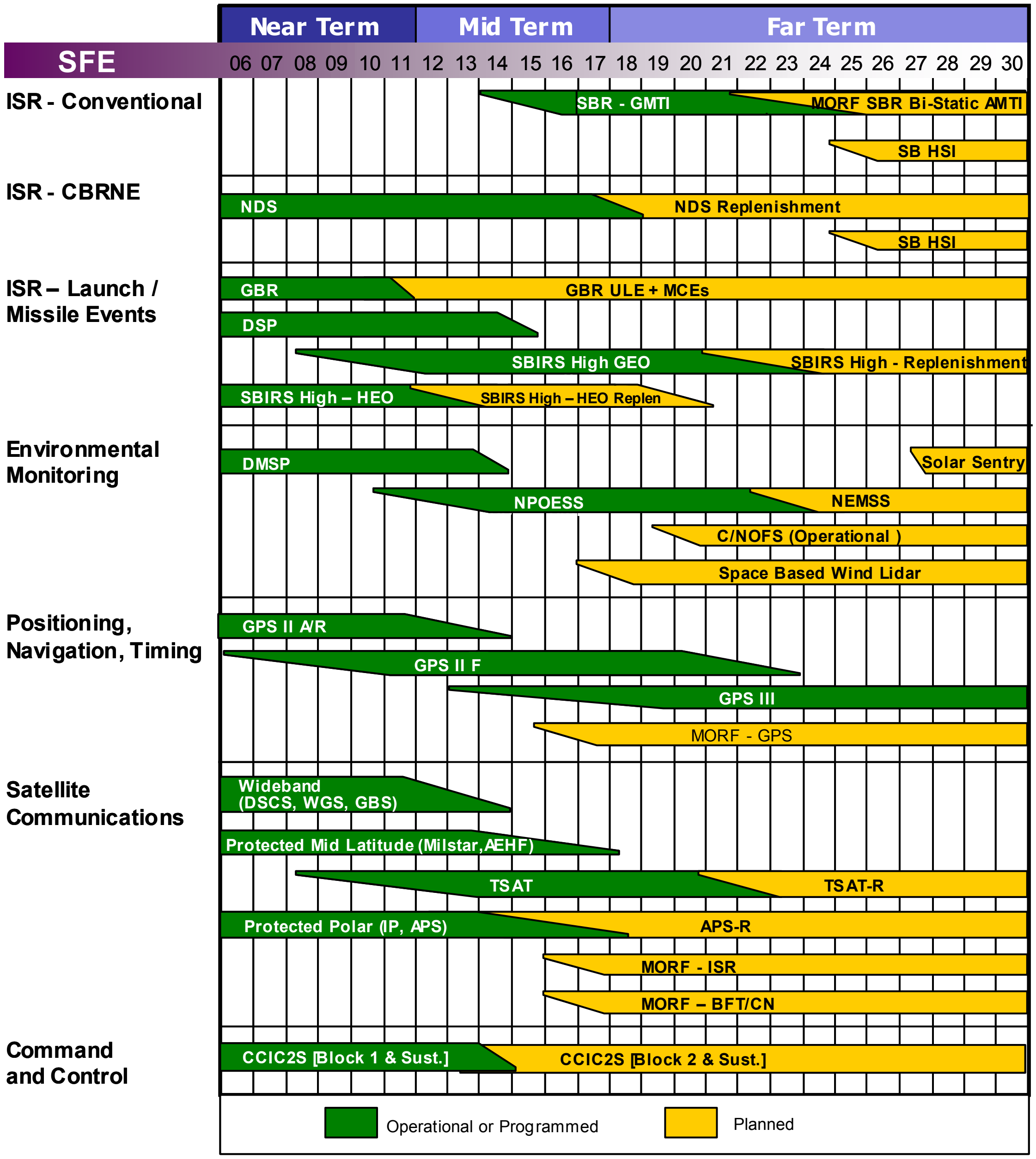

Figure 5-2: Space Force Enhancement (SFE) Roadmap

5.1.5 PLAN ASSESSMENT

This plan provides both significantly improved and new SFE capabilities. We are able to maintain and evolve our critical surveillance, SATCOM, navigation, and C2 capabilities to keep pace with growing requirements. The plan outlines new space capabilities to detect and track targets that currently can only be done from terrestrial-based systems. These new systems will be able to exploit the vantage point that space provides. However, as detailed in the SFE Mission Area Plan (MAP), the plan does leave some needs unfulfilled. These include the inability to globally detect and track CBRNE events and only a partial ability to satisfactorily monitor and forecast the space environment.

By improving our SFE capabilities as outlined in this plan, we will significantly enhance our support to all the Air Force capabilities, and specifically to the Global Strike and Space and Command Control Communication Computers Intelligence and Surveillance (S&C4ISR) Air Force capabilities. Enhanced detection of hidden or moving targets, and the ability to pass that knowledge to any warfighter requiring it, are just two examples of how AFSPC will support these Air Force capabilities.

5.2 COUNTERSPACE (CS)

5.2.1 WARFIGHTER'S PERSPECTIVE

Air Force CS capabilities are critical to the warfighter's ability to achieve strategic, operational, and tactical objectives. US forces are more dependent upon SFE than any other military forces. Our SFE capabilities give us an asymmetric advantage over our adversaries, so they make an attractive target set. The recent experience of GPS jamming by Iraqi forces in Operation Iraqi Freedom and of Iranian jamming of Voice of America transmissions on a commercial satellite signal that we are now in a new era wherein adversaries are willing and able to attack America's military and commercial space capabilities.

The loss of PNT, SATCOM, ISR, or C2 from space would significantly reduce the asymmetric advantage US forces have over adversary forces. The warfighter must be capable of defending SFE anywhere and anytime on or above the globe. Similarly, allowing adversary forces to have access to widely available SFE services also reduces our advantage. The warfighter must be capable of disallowing SFE to the adversary anywhere and anytime on or above the globe.

A summary of our analysis, supporting this conclusion, follows.

5.2.2 INTEGRATED PLANNING PROCESS PATHFINDER (IP3)

IP3 is an initiative to test adding more analytical rigor in developing a more optimum architecture. IP3 increased analytical fidelity in three primary areas: engagement level analysis for competing system concepts and final architectures (Guardian model), detailed cost assessments of system concepts and the final CS architecture and CS utility to the warfighter, and prioritization of sub-mission areas through Military Utility Analyses (MUA). Other tools provided the capability to further assess and refine the myriad of architectures from SCOUT. These additional analytical processes lay a solid technical and cost foundation for follow-on AoAs.

5.2.2.1 Current and Programmed Capabilities

The CS mission area includes the sub-mission areas of SSA, DCS, and OCS. AFSPC’s current and programmed CS capabilities have, as a whole, been sufficient for the needs of the modern warfighter, but only because our exploitation of the space medium has until recently been uncontested.

SSA capabilities perform ISR and space environmental characterization functions and are the crucial enablers for DCS and OCS capabilities. AFSPC is responsible for operating and maintaining the majority of the systems that make up the USSTRATCOM Space Surveillance Network (SSN). This includes ground-based radars and optical sensors, a space-based sensor, and the Space Control Center (SCC). The sensors and SCC, in concert with the USSTRATCOM Joint Intelligence Center (STRATJIC) and Air Force Weather Agency (AFWA), provide most of the warfighter's SSA. The SCC is part of the programmed CCIC2S and, coupled with the STRATJIC, will be essential to integrating contingency planning for air and space forces. Today, the sensors find, fix, track, and provide characterization data to the SCC and JIC, which complete the tasks of characterize, target, assess, and command and control. They task sensors and process, exploit, and disseminate (PED) the data to maintain the satellite catalog in support of deconfliction, space order of battle, satellite overflight warning, and space event characterization functions. Our SSA capabilities are less than adequate today. The sensors cannot consistently find small debris and have limited capability to find, track, and characterize objects in high-altitude orbits. Accordingly, our current capabilities do not meet all our timeliness requirements and have resultant gaps in coverage. These deficiencies amount to three main needs between now and the planning horizon:

- Improve ability to find, fix, track, and provide characterization data on red, gray and blue near earth objects and events via all SSA disciplines.

- Improve ability to find, fix, track, and provide characterization data on red, gray and blue deep space objects and events via all SSA disciplines.

- Improve ability to adequately process and analyze data from all space regimes and from all SSA sources.

In addition to shortfalls in space surveillance, there is also a deficiency in the ability to distinguish man-made attack and other sources of anomalies from natural environmental effects. These deficiencies relate to three needs:

- Improve ability to observe operationally relevant aspects of the natural space environment
- Improve our ability to rapidly fuse various sources of environmental data into a coherent and accurate current and forecast picture of the natural space environment
- Improve our ability to rapidly process environmental data and link it to system effects

DCS capabilities seek to deter adversaries from attacking our space capabilities, to defend them if an adversary does attack and to recover lost capability as quickly as possible after an attack. These capabilities are currently of higher precedence than OCS capabilities. We know that many potential adversaries are capable of attacking US space systems today. A system consists of three segments: space, link, and ground/surface segments. We must expect further attacks by nation-states or non-state (e.g., terrorist) actors on US military, civil, or commercial space systems. Intelligence, wargaming and experience project both capability and likelihood to rise dramatically in the near future-especially when associated with armed conflict. Our analysis concentrated on defending the space and link segments of a space system, while leaving the defense of ground/surface segments to force protection (MS). We must fill three major DCS space and link needs between now and the planning horizon:

- Advance measures to ensure mission survivability during any known method of attack. Success in this area will improve defense by fending off or enduring attacks, and deterrence by convincing a potential adversary that any attack will have little, if any, desired effect.

- Mitigate mission impact resulting from an attack and quickly restoring services based on mission priorities. This addresses the "recover" portion of DCS.

- Starve the adversary of friendly SFE while maintaining the services for friendly use.

OCS capabilities are intended to negate adversary space services. This sub-mission area is currently the least urgent capability AFSPC can provide, but we are proactively preparing for the future when it will become closer in importance to DCS. AFSPC still must address the following needs between now and the planning horizon:

- Provide the capability to create reversible effects (deceive, deny, disrupt) against adversary space capabilities
- Provide the capability to create irreversible effects (degrade, destroy) against adversary space capabilities

Today the US holds an unquestioned advantage in space, which allows us to operate freely in a medium that increasingly is vital to the political, economic, and military well being of the US and its allies. Therefore, SFE now forms a center of gravity, and the ability to shape the military space environment is crucial to US national interests. As such, the ability to gain space superiority (the ability to exploit space while selectively disallowing it to adversaries) is critically important and maintaining space superiority is an essential prerequisite for success in modern warfare. Every military operation since the Gulf War has powerfully demonstrated the vital importance of SFE to military operations. To date, we have enjoyed *de facto* space superiority, but adversaries have shown that they have taken notice.

AFSPC has accepted its responsibility to lead in CS. The building blocks of a CS capability are in final development. Between now and 2030, the command will deploy CS systems, stand up a CS squadron and a Space Test and Training Range (STTR) and will further its commitment to S&T research.

5.2.2.2 Plan Objectives

CS Mission Area planners have three strategic goals:

- Dominant CS Capabilities: Simply, we must be able to quickly subjugate any space capability any adversary can field while maintaining our own. This includes the infrastructure and enablers as well as the "pointy end of the spear."
- A Balanced Mix: AFSPC will provide the majority of any space-based capabilities in the DoD's mix of tactics, techniques, procedures, methods, and basing modes. The command will also provide any complementary terrestrial (air or surface) CS capability necessary to ensure the ability to gain and maintain space superiority.
- Full Theater Integration: This will allow the COMAFFOR to plan for CS effects, synchronize effects with those of surface and air forces, task CS forces directly from theater operations centers, adjust the operation during execution and integrate CS feedback into combat assessment. Theater integration also requires space forces that fully understand how their capabilities work in concert with forces of the other media to achieve desired theater effects through parallel operations.

Figure 5-3 highlights AFSPC's time-phased roadmap for the CS mission area. SSA is the permanent crucial enabler for DCS and OCS. However, AFSPC will base the desired characteristics of the SSA data (such as quality, quantity, and timeliness) on DCS and OCS requirements and treaty obligations. Again, DCS is of greater urgency than OCS in the Near-Term, but by the Far-Term, DCS and OCS will have similar precedence. Some level of each general CS capability, appropriate to counter the projected space capabilities of potential adversaries, will be necessary in each period.

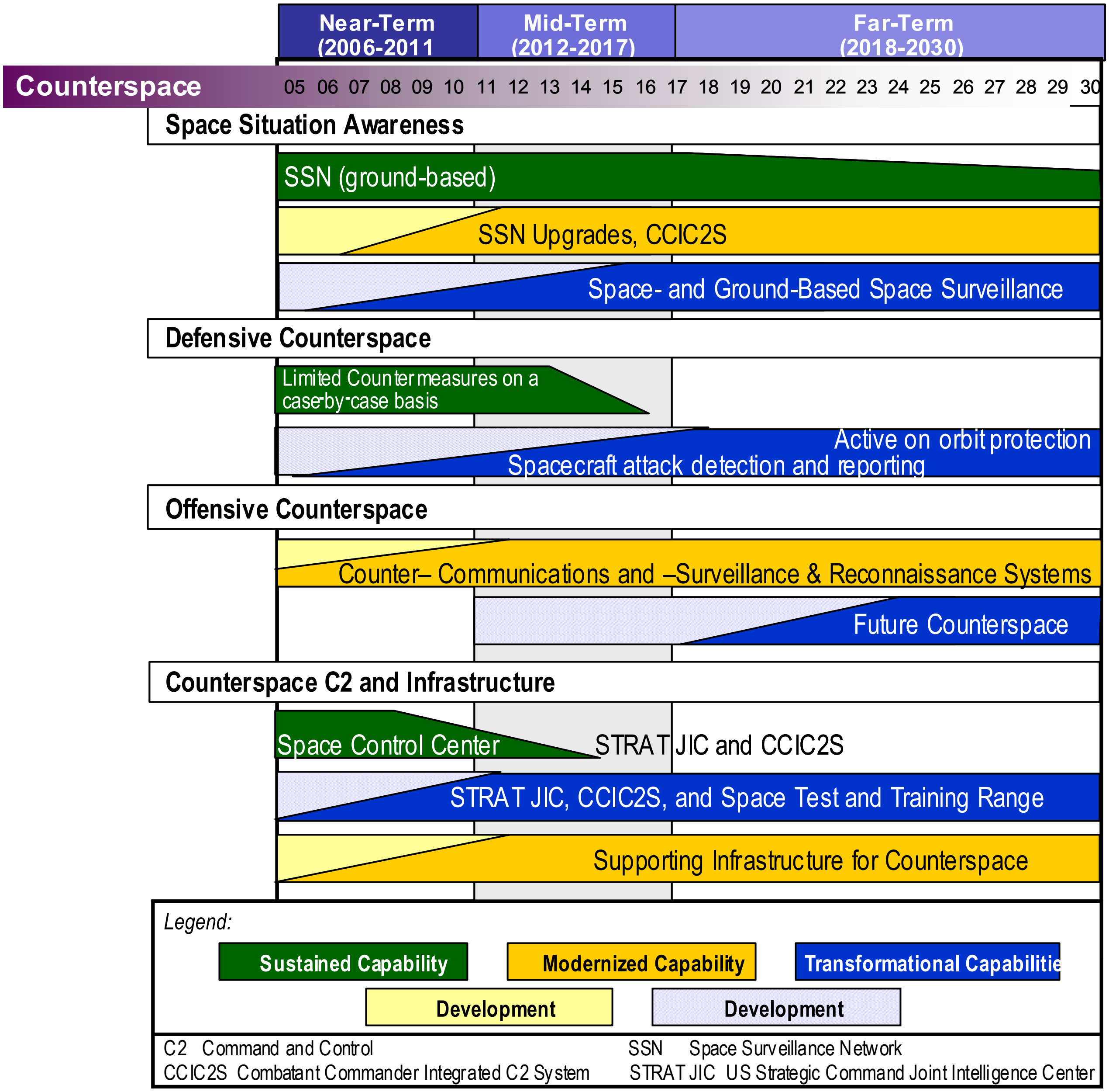

Figure 5-3: Counterspace (CS) Roadmap

To facilitate maximum CS effectiveness, we will work directly with USSTRATCOM, the other AFSPC mission areas, Air Force MAJCOMs, Services and agencies, and foreign militaries. We will accelerate the evolution of needed technologies and work to keep each entity focused on its areas of expertise.

We stated earlier that the command is working on DOTMLPF for all of CS. By examining each of these elements, AFSPC will bring the greatest possible CS utility to the warfighter at the strategic, operational and tactical levels of war, whether the battlespace is abroad or at home.

We will make the necessary materiel and non-materiel changes to ensure US military, civil, and commercial space capabilities can exploit space for the benefit of America and her friends.

5.2.2.3 *Sustain and Modernize*

Figure 5-3 shows that AFSPC will *sustain* the systems that provide its current capabilities through a variety of Service Life Extension Programs (SLEPs) and other modifications until those systems are no longer necessary. AFSPC will also strive to incrementally *modernize* by enhancing its SSA capabilities and developing initial DCS and OCS capabilities. Evolutionary examples include:

- SSA – AFSPC will augment the SSN with an upgrade to the Haystack radar and a new, dedicated ground-based X-band phased array radar network to improve detection of small objects. AFSPC will also develop an integrated SSA C2 architecture based on Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) Operational Views of the CCIC2S architecture. This development will enable AFSPC to fully integrate all four elements of SSA. These programmed modernizations improve all three needs listed above in Current and Programmed Capabilities section.

- DCS – AFSPC will enhance survivability and the defense of all its space capabilities by improving defensive tactics, techniques, and procedures and ensuring all future Air Force space systems incorporate countermeasures, to include passive and active on- and off-board solutions. By doing so, the command will begin to address most of the crucial needs listed above.

- OCS – In the Near- and Mid-Term, AFSPC will field initial ground-based OCS capabilities such as a mobile Counter-Communications System, a Counter-Surveillance and Reconnaissance System, and a Counter-Navigation system, which will disallow adversaries use of space-based navigation signals. These systems will deliver capability to produce reversible effects. AFSPC will continue to pursue lethal or non-lethal effects such as the use of deception, disruption, denial, degradation, and destruction of space capabilities.

5.2.2.4 Transform

AFSPC will *transform* its CS capabilities by fielding revolutionary capabilities to leapfrog ahead to fulfill the mission area's needs through the Mid- and Far-Terms. Examples include:

- SSA – Space-based space surveillance systems including inspector satellites that are capable of providing details of space objects unattainable by ground-based systems.

- DCS – An attack detection and reporting architecture based on the Rapid Attack Identification, Detection, and Reporting System (RAIDRS) concept capable of detecting, characterizing (identify and geo-locate), and reporting attacks on space systems, and assessing the resulting mission impacts (Acquisition Program: Space System Attack Identification and Characterization (SSAIC) MNS-99).

- SSA/DCS/OCS – A STTR where engineers and doctrinaires will try theories and concepts, testers will evaluate new systems and space warriors can hone their defensive and offensive skills.

- DCS – Off-board DCS capabilities to help space-based systems defend against kinetic energy and physical attacks.

- OCS – Full spectrum, space-based OCS systems that bring the capability of negating adversarial space capabilities.

- Readiness to launch on demand, capability to be transferred to necessary orbits, and the capability to be serviced by on-orbit servicing spacecraft for life extension.

5.2.2.5 Plan Assessment

This iteration of the IPP produced several important findings:

- The ability to meet very stringent sensor-to-target timelines is a vital SSA capability DCS will require. NOTE: OCS systems also require timely sensor-to-shooter data.

- SSA, DCS, and OCS produced true synergistic effects when planners performed the MUA against a near-peer in a scenario directed by Defense Planning Guidance (DPG). This synergy may also occur in other scenarios.

- Infrastructure and enabling capabilities are essential to the effectiveness of CS systems

- On-board defensive systems are most effective for defending space-based capabilities against all attack methods but kinetic energy and physical. They are also most cost-effective.

- Off-board DCS systems provide defense in depth for kinetic energy and other physical methods of attack, but are more expensive than on-board systems.

- The DCS function must break the adversary's kill chain against each applicable vulnerability, if it is to be successful.

- DCS is twice as important as OCS in MUA on a DPG-directed near-peer scenario. Similar differences in precedence are likely in other scenarios.

- In a scenario in which the adversary has access to commercial or other third-party space services, the ability to perform reversible negation provides greater utility to the US warfighter than the ability to irreversibly negate. Adversary access to neutral-party assets is the most probable projected scenario.

- Multi-role systems contribute to more capabilities and, therefore provide the greatest utility to the warfighter.

The CS portion of the SMP is key to the success of every Chief of Staff of the Air Force Task Force CONOPS. Our ability to thwart disruption of our navigation and timing signals will be critical to the precision strike capability required by the Global Strike, Air and Space Expeditionary, and Global Response CONOPS. Capabilities that negate adversary space-based ISR, communications, navigation and weather services will also be crucial in achieving the goals laid out in those CONOPS. Defending our communications is critical to passing weather data and other information required to support the airlift capabilities required by the Global Mobility CONOPS. CS capabilities play key enabling roles in the S&C4ISR CONOPS. Lastly, keeping our adversaries from gaining information on CONUS-based locations and working to protect valuable commercial and civil capabilities will be an essential part of the Homeland Security CONOPS.

5.3 SPACE FORCE APPLICATION (SFA)

5.3.1 CURRENT AND PROGRAMMED CAPABILITIES

Today's SFA capabilities focus on nuclear deterrence, which is provided by nuclear-armed Minuteman (MM) III and Peacekeeper ICBMs and the infrastructure to maintain and protect them. The December 2001 NPR directs the Air Force to "extend the life of MM III until 2020, while beginning the requirements process for the next-generation ICBM." This effort is well underway, with both the completion of the Land-Based Strategic Deterrent (LBSD) Mission Needs Statement and the beginning of an AoA study. The AoA becomes even more important as the Peacekeeper ICBM is deactivated by the end of FY05.

AFSPC currently cannot provide a non-nuclear, prompt global strike capability to the warfighter, enabling a wide range of precise and selective lethality. However, completed LBSD and Prompt Global Strike AoAs should result in selecting operationally responsive options for applying force from or through space using non-nuclear munitions.

Although Missile Defense and Counterair capabilities remain extremely important to theater commanders and Homeland Defense leadership, at this time there is no AFSPC force application role in the planning horizon to provide this capability.

5.3.2 PLAN OBJECTIVES

Figure 5-4 highlights AFSPC's time-phased roadmap for the SFA mission area. Nuclear deterrence has been one of our nation's highest priorities and will continue to be a top priority for AFSPC through the Far-Term. In the Near-Term, several MM III life extension programs currently underway will provide for a capable, reliable, and fully supportable MM III missile over the next two decades. We will also proceed with developing a non-nuclear prompt global strike capability to be fielded in the Mid-Term.

5.3.3 SUSTAIN AND MODERNIZE

We will sustain MM III with life extension programs through 2020 and we will field a follow-on ICBM with an IOC of 2018. Additionally, we will continue to sustain and modernize the nuclear support infrastructure (e.g., communications networks, mobile command and control center, helicopter and security programs). AFSPC's chosen course of action will allow sustainment of MM III through its end of life, investment in MM III Elite, LBSD, and prompt global strike, therefore increasing AFSPC's capability to maintain a vital nuclear deterrence and critical support through the Far-Term.

5.3.4 TRANSFORM

Non-nuclear prompt global strike from and through space can *transform* the warfighter's role in the future. Most notably, a non-nuclear strike capability, possibly in the form of a Common Aero Vehicle (CAV) launched by a ballistic missile, air launch system, or a SOV, could provide the President and the Secretary of Defense with a range of space power options. These options are for deterrence and flexible response when time is absolutely critical, risks associated with other options are too high, or when no other courses of action are available.

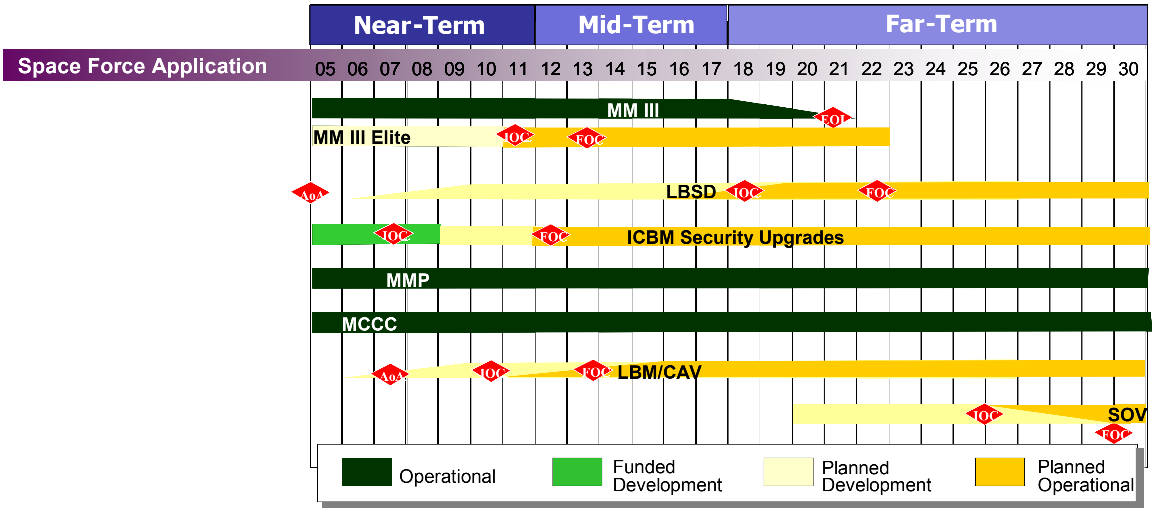

Figure 5-4: Space Force Application (SFA) Roadmap

5.3.5 PLAN ASSESSMENT

The SFA mission area's top priority is to sustain a credible nuclear deterrent force. This plan meets this priority while also providing new, non-nuclear deterrence/strike options in the Mid- and Far-Terms. The plan, however, does not provide for a Target & Engage capability for missile defense. The Army and Navy will provide some terrestrial-based capabilities against a limited ballistic missile attack by 2004—the Air Force has not been directed to provide force application assets at this time. Furthermore, there is no AFSPC-provided Counterair warfighter capability.

Our ability to implement the nuclear and non-nuclear deterrence/strike portion of the plan will be key to the success of the capability-focused Global Strike, Global Response and Nuclear Response Capabilities CONOPS. A credible, viable nuclear deterrent force forms the cornerstone of the Nuclear Response CONOPS. This plan also highlights the sustainment and modernization necessary to ensure that deterrent force remains viable and credible. The plan also focuses on the increasing urgency of deploying a non-nuclear prompt global strike capability. The end result will tremendously bolster the sought after capabilities in the Global Strike CONOPS.

5.4 SPACE SUPPORT (SS)

5.4.1 CURRENT AND PROGRAMMED CAPABILITIES

AFSPC employs the Air Force Satellite Control Network (AFSCN) to provide satellite operations services to select DoD, National, Allied and Civil satellites. The AFSCN is comprised of two primary control nodes (located at Schriever Air Force Base (AFB), CO and Onizuka Air Force Station (AFS), CA), eight remote tracking stations and other control resources around the world. Today's AFSCN does not perform all satellite operations for all satellite missions-typically it provides launch, early orbit and anomaly resolution services to the majority of satellite missions. It also provides low data rate mission data retrieval for requested satellite missions. For the satellite missions that do not use the AFSCN, there are program-unique ground stations and associated infrastructure.

AFSPC's current fleet of launch systems is comprised of a mix of medium- and heavy-lift expendable boosters. This fleet is currently transitioning to the new Evolved Expendable Launch Vehicles (EELV), which are the Delta IV and Atlas V families of launch vehicles. These vehicles support routine launch operations. By the Mid-Term, an assessment of EELV responsiveness, reliability, and affordability will be needed (represented in the Launch Operations roadmap by a diamond with DP [Decision Point]) to determine the future direction of routine spacelift. The evolutionary direction would extend EELV out into the future, while a revolutionary approach could be to move towards a spacelift capability providing orders of magnitude reduction in cost, significant improvements in responsiveness and greater reliability.

To launch these boosters, AFSPC maintains the Launch and Test Range System (LTRS) consisting of the Eastern Range controlled from Cape Canaveral AFS, FL, and the Western Range controlled from Vandenberg AFB, CA.

SS also advocates for the command's Modeling, Simulation, and Analysis (MS&A) requirements, rapid prototyping and demonstration of cutting-edge space-centric technologies and Force Development Evaluation (FDE) efforts. Current MS&A tools focus on system-level analyses for system-specific missions, but are limited in their ability to address operating constraints to support multiple missions, integration with terrestrial missions, and multiple theaters. Minimal MS&A capabilities currently exist for quantifying the military value of space systems, particularly mission and campaign warfighting contributions. Additionally, AFSPC has contracted most mission and campaign studies in the past. This approach supported the development of proprietary tools for each study without creating a common set of reusable models, data and scenarios.

AFSPC conducts FDE over the life of fielded systems to evaluate the operational effectiveness and suitability of AFSPC systems.

5.4.2 PLAN OBJECTIVES

Figure 5-5 highlights AFSPC's time-phased roadmap for the SS mission area. The objective for Satellite Operations is on-demand execution of any US government space asset to support the full spectrum of worldwide military operations. In Launch Operations, AFSPC will strive to provide robust and responsive spacelift to support time-sensitive military operations and to develop capabilities to reposition, recover, and service assets on orbit. We will also develop an FDE infrastructure for evaluating space systems prior to declaring them operational. The resulting FDE infrastructure, combined with institutionalized and integrated MS&A capabilities, will be used to evaluate existing and emerging space concepts, strategy, doctrine, tactics, and utility.

5.4.3 SUSTAIN AND MODERNIZE

AFSPC will *sustain* and *modernize* its current Satellite and Launch Operations into the Far-Term when it will transition to advanced capabilities. Examples of this approach include:

- Satellite Operations – AFSPC will sustain the AFSCN and implement a robust operational training capability. In the Mid- and Far-Terms, AFSPC will evolve our satellite operations capability to produce a national resource that will be integrated, robust, responsive, and able to support faster spacecraft initialization times. This Integrated Satellite Control Network (ISCN) will improve our ability to respond quickly to changing warfighter requirements for space services. Selected DoD and Civil satellite control capabilities will be integrated to produce complementary, interoperable networks that enhance mutual satellite operations support for launch, early orbit, anomaly resolution, and limited mission data handling functions. The ISCN will also allow a new architecture to meet the needs of a future environment with more satellites, greater commercial presence, long-term human activity in space, increased national security reliance on space, and new fiscal realities

- Launch Operations – AFSPC will sustain Delta IV, Atlas V, and the Launch and Test Ranges into the far-term when advanced launch systems, upper stages, and a Global Launch and Test Range will be fielded to provide routine launch that is more robust and responsive. Additionally, AFSPC will continue to explore launch systems with the potential of providing one or more orders of magnitude reductions in costs to enhance our space access and responsiveness.

- MS&A/FDE – AFSPC created the Space Analysis Division to be its *Center of Excellence* for MS&A. The Space Analysis Division consolidated dispersed and disparate analysis capabilities and will help establish a robust and consistent toolset and methodologies for the command. AFSPC will also establish the STTR to improve its FDE capabilities for CS and to ensure those systems are properly evaluated prior to being fielded. In addition, the STTR may support FDE for the other space mission areas in the Mid- and Far-Terms. The Space Warfare Center (SWC) 595th Space Group, the 576th Flight Test Squadron, the 17th Test Squadron, and Air Force Reserve Command's (AFRC) 14th Test Squadron are the primary units tasked to execute the FDE mission.

- Space Research and Development (R&D) – AFSPC will continue to manage the Space Test Program (STP) on behalf of the Air Force, our sister Services, and DOD agencies. AFSPC intends to enhance this program by using it as a test bed for spiral development and standardizing spacecraft designs and operations where appropriate. SMC Det 12 is responsible for managing the STP program and will pursue opportunities to increase the opportunities for DOD experiments to be flown in space.

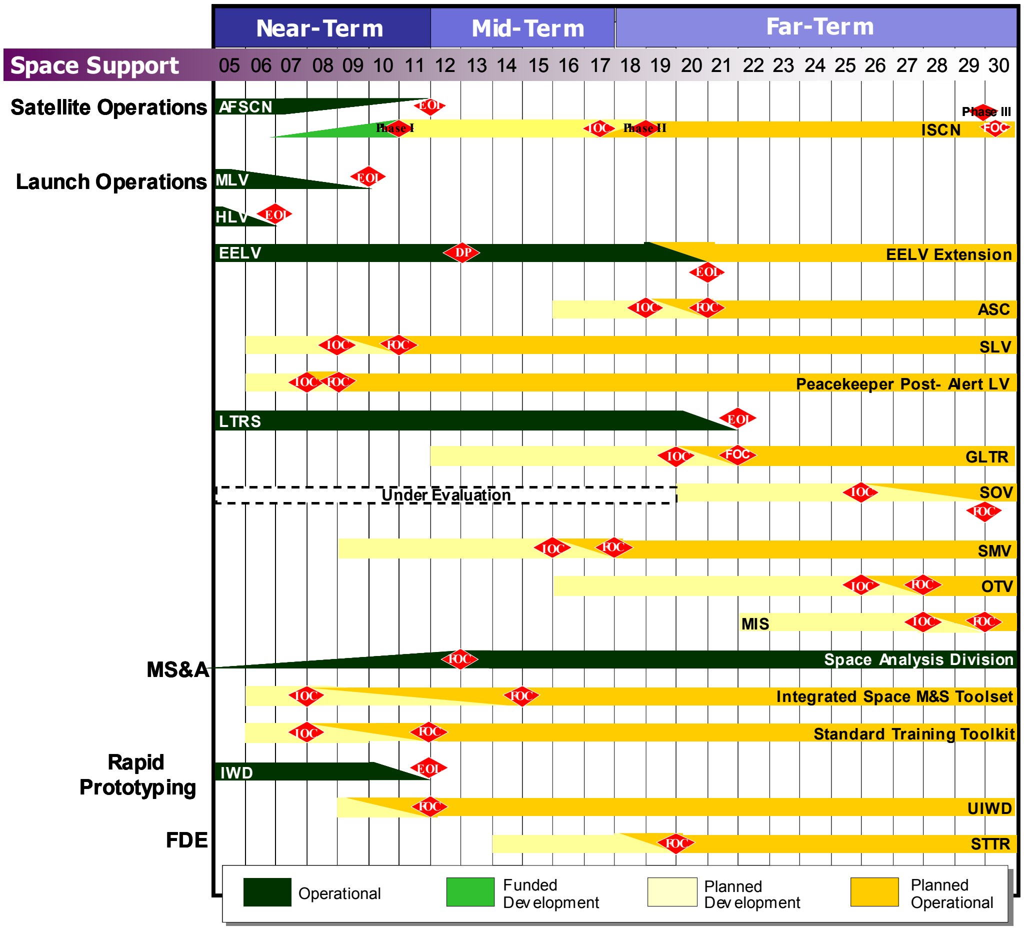

Figure 5-5: Space Support (SS) Roadmap

5.4.4 TRANSFORM

AFSPC will begin working in the near-term to field several *transformed* SS capabilities in the Mid- and Far-Terms. Examples include:

- Robust and responsive spacelift and rapid satellite configuration and on-orbit initialization providing quick-turn, on-demand, assured space access for time-sensitive military operations

- Orbital transfer vehicles to reposition or boost on-orbit assets

- Space-based elements of the LTRS to increase coverage while reducing operations and maintenance (O&M) costs associated with the ground-based infrastructure

5.4.5 PLAN ASSESSMENT

This plan satisfies the sustainment and modernization needs of current systems. AFSPC will evolve the AFSCN into a national resource that is integrated, robust, responsive, and able to support faster spacecraft initialization times to provide on-demand operations execution. For routine launch operations, EELV adequately covers our medium and heavy payload needs.

Funding transformational capabilities is always a challenge. Responsive spacelift will be a new capability that will open new realms of possibilities. It will be focused on rapid response, affordability and payload capacity for warfighter operations. As with any new capability, this will require significant funding in the future. Without Near-Term investments, this capability may not be available in time to support a host of missions such as global strike in an anti-access environment. In order to adapt the LTRS to meet responsive spacelift requirements and to modernize its architecture, LTRS must be transformed to a Global Launch and Test Range System (GLTRS.) Funding for this initiative must parallel the development of responsive spacelift.

Our SS plans will have the greatest impact on the Global Strike, Global Mobility, S&C4ISR, Global Response, and Air and Space Expeditionary CONOPS. A responsive launch and on-orbit checkout capability will allow us to quickly enhance our ISR coverage of a new area of interest or expand our lines of communications to support Global Strike, S&C4ISR, and Global Mobility. And as the “kick down the door” phase transitions to a more protracted conflict, responsive launch, combined with responsive payloads, will enable us to support the Air and Space Expeditionary Force through sustainment and replenishment of our space assets.

5.5 MISSION SUPPORT (MS)

5.5.1 RESPONSIBILITIES AND FUNCTIONAL AREAS

The AFSPC MS functional areas provide the infrastructure, sustainment, security, and trained personnel needed to perform our missions around the globe. They cut across all four mission areas to ensure effective and efficient operations.

- ***Communications and Information (C&I) Infostructure*** provides and sustains information assurance, positive C2 of strike resources, management, transport capabilities, and the communications and computer hardware and software resources for our forces worldwide.

- ***Logistics*** provides the organizations, systems, and processes needed to maintain the mission readiness of AFSPC’s fielded systems. (Since this analysis, C&I and Logistics have been organizationally combined and accordingly referred to as Logistics and Communications.)

- ***Civil Engineering*** provides, operates, maintains, and restores installations, facilities housing and environment needed to support our space and missile forces.

- ***Security Forces*** provides policy guidance, specialized training, and personnel to maintain our physical security of ICBMs, spacelift facilities, space system ground assets, C2, and other facilities.

- ***Training and Exercises*** ensures that all our mission ready forces are trained and exercised in the technologies they find on the job.

- ***Education*** ensures that all command levels are “space-educated,” and that programs are in place to foster the development of Space Professionals.

- ***Medical*** ensures a fit and vital military force, operates the TRICARE managed care system, and provides health care to deployed forces and to all other beneficiaries.

5.5.2 PLAN HIGHLIGHTS

Our ability to develop and maintain 21st Century air and space warriors and infrastructure is just as crucial to the success of the our vision as employing new technologies and advanced concepts. Improvements in MS effectiveness and efficiency enhance the ability of the mission areas to meet their goals and objectives. Planned MS improvements are detailed in the MSP, but some of the objectives are highlighted in this chapter:

- The C&I Infostructure will transform to provide seamless information accessibility and sharing to support all operations, C2, and MS functions.

- With adequate funding, Civil Engineering will ensure suitable facilities and infrastructure, environment, emergency services, and combat-ready forces are available to meet near, mid and long term AFSPC mission support requirements.

- Training, Exercise, and Education capabilities of the future will transform to provide a virtual, global, synthetic battlespace in which space forces, fully integrated with other US and allied forces, will not only train but also rehearse missions through the distributed mission operations concept. Space professionals will be developed and emerge from all areas of the “space community.”

6 The Way Ahead

6.1 CHALLENGES

Achieving our vision of fully exploiting the advantages of space while ensuring space superiority will not be easy. We will face many challenges, a few of which are summarized here.

6.1.1 PEOPLE

As previously stated, the US military enjoys an asymmetric advantage via our space capabilities that is not widely understood. Space is deeply imbedded in our warfighting capabilities, and we have come to rely on our space capabilities as a fact-of-life utility. But much more awaits us. Training and education are crucial in fostering the cultural change required as we move from an air force to an integrated air and space force. We must help commanders and the forces they command become confident and competent users of space capabilities. Likewise, we must help our space professionals better understand air, land, and sea operations to become better force enablers and transition into full spectrum combat commanders. Additionally, AFSPC must ensure the proper mix of reserve, guard, active duty, civilians, and contractors to develop and provide the space capabilities required by our vision. AFSPC must foster the development of space professionals capable of developing new doctrine and concepts of operations for space launch, offensive and defensive space operations, power projection in, from and through space. These space professionals must also be encouraged to develop other military uses of space while operating some of the most complex systems ever built and deployed.

6.1.2 PARTNERS

The need for space systems is growing, and a more open flow of ideas and cross-link of capabilities are essential. We can achieve our vision only if we work together with other organizations toward a unified goal. We must continue to establish and maintain key partnerships with the NRO, DoD, NASA, National Oceanic and Atmospheric Administration (NOAA), Defense Advanced Research Projects Agency (DARPA), Missile Defense Agency (MDA), industry, other MAJCOMs and Services, and applicable international agencies.

6.1.3 FUNDING

Funding is one of our biggest challenges. Even though this plan is based on an assumed real growth in TOA of 3% per year after the FYDP, we still must delay the development of many of our desired advanced capabilities to later in the planning horizon or leave them out of the plan altogether. AFSPC must continue to advocate for adequate funding while investigating opportunities for decreasing costs (e.g., spiral development, cost sharing, and divestiture).

6.1.4 INDUSTRIAL BASE AND TECHNOLOGY LINKAGE

A strong US industrial base is essential to help provide us with the technology, people, acquisition, and logistics bases we need to support the development of our envisioned space capabilities. The Secretary of Defense has directed Headquarters (HQ) AFSPC to prioritize, oversee, and direct space-related lab work.

S&T is integral to our planning process. Most of the future concepts and solutions included in this plan depend on the development of new technologies and the maturation of existing technologies. In some cases, needs are addressed by partial concepts or solutions, or not satisfied until the Far-Term. Our S&T programs should continue to pursue revolutionary concepts and next generation capabilities to address these shortfalls. See Appendix E for a detailed description of the S&T process.

Additionally, the SWC plays a critical role in leveraging current national, military and commercial technologies to address warfighter requirements. SWC divisions like the Space Battlelab, Air Force Tactical Exploitation of National Capabilities (TENCAP), Fusion Center, Space Application and Integration Facility (SPAIF), and others routinely partner with private industry, military labs, agencies, commands, commanders, and national organizations to bring rapid solutions to address warfighter requirements.

6.1.5 POLICY/TREATY

To fully develop and exploit potential CS and space-based SFA capabilities, some US policies and international treaties may need to be reviewed and modified.

6.1.5.1 Counterspace

There are presently no formal US policies preventing development or deployment of CS capabilities. In actuality, the President's National Space Policy, the DoD Space Policy, and the Secretary of Defense's policy on CS all require development of "negation" capabilities and deployment as needed to ensure freedom of access and operations in space. However, the President and/or the Secretary of Defense approval will be required for any employment of force against enemy space assets, including ground and link segments of space systems. The major question in fielding OCS systems is the political will to do so.

6.1.5.2 Conventional Strike

Our vision calls for prompt global strike space systems with the capability to directly apply force from or through space against terrestrial targets. International treaties and laws do not prohibit the use or presence of conventional weapons in space. Policy makers are working to create conditions for a new Strategic Triad that includes non-nuclear global strike weapons. Non-nuclear prompt global strike space capabilities are being studied. Our nation's leadership will decide whether or not to pursue the development and deployment of conventional, space-based systems for global strike to fully exploit the advantages of space.

6.1.5.3 Strategic Deterrence

As part of US-Russia initiatives to further reduce their respective nuclear arsenals, the US will continue to reduce its nuclear forces. The US has reviewed its nuclear strategy and force structure and developed a prudent draw-down schedule to ensure we maintain our national security needs. In keeping with our international obligations, as well as our national security requirements, all three legs of the nuclear triad will undoubtedly see further reductions. The latest NPR speaks of the need to maintain enough capabilities to provide both a credible and adaptable deterrence posture. The NPR cautions that the "United States should prepare for deterrence failure even as it strives to deter." Thus, our deterrence capabilities should be responsive to and adaptable in a dynamic security environment. Therefore, we remain committed to ensuring our ICBM arsenal is modernized to maintain an effective force and deterrent posture while pursuing a new generation of responsive prompt global strike capabilities.

6.1.6 TRANSFORMATION

AFSPC must manage two major transformation dilemmas, both of which arise from the need to invest scarce resources.

The first transformation dilemma is the need to balance Near-Term, operational risk against future risk in investment decisions. Postponing major investments in transformation while devoting the bulk of resources to reducing Near-Term operational needs raises the risk of being overtaken by our adversaries. Progress in transforming requires significant investments in those aspects of transformation that we are confident have enduring benefits such as ORS. Because of limited resources, this may mean making the difficult decision of foregoing currently planned systems and investing instead in capabilities that we believe will reduce future risk.

The second transformation dilemma is the need to invest now in specific technologies and concepts that are deemed transformational, while remaining open to other paths towards transformation. To transform the force we must commit resources, yet remain detached enough from these commitments to continue an iterative process of innovation and experimentation that permits new insights to guide future investment decisions.

6.2 CONCLUSION

As demonstrated with Operation Iraqi Freedom and Operation Enduring Freedom, the contribution of space systems to the joint warfighter continues to grow. These systems, with their ultimate “high ground” access, their ability to rapidly forward deploy with a minimal logistics tail and their relative immunity from threats are invaluable assets to the land, sea and air warfighters. This SMP describes AFSPC’s strategy to transition into a space combat command, maintaining and increasing the “force multiplier” advantage these systems provide while expanding the role of space in future conflicts as a significant force provider. This is being done through a carefully considered blend of sustainment, modernization, and transformation, and is accomplished within AFSPC’s mission area construct (CS, SFA, SFE, MS, and SS). In the next cycle, this plan will be even more tightly integrated with the Air Force’s most recently developed capability-based CONOPS.

No matter how it is structured, the end result will be a fiscally reasonable and technologically achievable plan-one that produces a fully integrated Air and Space Force that is persuasive in peace, decisive in war and preeminent in the application of space power.

APPENDIX A: REFERENCES

America's Air Force Vision 2020, 2002

National Space Policy, September 1996

Nuclear Posture Review (NPR), December 2001

Air Force Executive Guidance, January 1996

USAF Scientific Advisory Board Study, "A Space Roadmap for the 21st Century Aerospace Force," November 1998

DoD Directive 3100.10, Space Policy, July 1999

DoD Instruction 3100.15, January 2001

Joint Vision 2020, July 2001

USSPACECOM Vision for 2020, 1997

AFSPC SFE MAP, FY06 and Beyond

AFSPC SS MAP, FY06 and Beyond

AFSPC SFA MAP, FY06 and Beyond

AFSPC CS MAP, FY06 and Beyond

AFSPC MSP, FY06 and Beyond

Space Science & Technology Guidance, September 2003

AFSPC and NRO FY05 Collaborative Space Plan

AFSPC 2004 Strategic Master Plan (SMP), November 2002

AF Annual Planning and Programming Guidance (APPG), 2000

NORAD Vision 2010, December 1999

The Report of the Commission to Assess United States National Security Space Management and Organization (or The Rumsfeld Space Commission Report), January 2002

Interim Space Capstone Threat Capabilities Assessment (NAIC-1564-0727-03 dtd Jul03); Threats to US Space Systems and Operations Over the Next Ten Years (NIC-ICB 2003-09C dtd 19Feb03)

APPENDIX B: ACRONYMS AND ABBREVIATIONS

A

AEHF	Advanced Extremely High Frequency
AFB	Air Force Base
AFDD	Air Force Doctrine Document
AFMC	Air Force Materiel Command
AFRC	Air Force Reserve Command
AFS	Air Force Station
AFSC	Air Force Systems Command
AFSCN	Air Force Satellite Control Network
AFSPC	Air Force Space Command
AMTI	Airborne Moving Target Indicator
AoA	Analysis of Alternatives
APPG	Annual Planning and Programming Guidance
APS	Advanced Polar System

C

C&I	Communications and Information
C2	Command and Control
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance
CAV	Common Aero Vehicle
CBRNE	Chemical, Biological, Radiological, Nuclear, and High Explosive
CCIC2S	Combatant Commanders Integrated Command and Control Center System
COG	Centers of Gravity
COMAFFOR	Commander Air Force Forces
CONOPS	Concept of Operations
CS	Counterspace

D

DARPA	Defense Advanced Research Projects Agency
DCS	Defensive Counterspace
DHP	Defense Health Program
DMSP	Defense Meteorological Satellite Program
DoD	Department of Defense
DOTMLPF	Doctrine, Organization, Training, Materiel, Logistics, Personnel and Facilities
DPG	Defense Planning Guidance
DSCS	Defense Satellite Communications System
DSP	Defense Support Program

E

EELV	Evolved Expendable Launch Vehicle
EM	Environmental Monitoring

F

FDE	Force Development Evaluation
FY	Fiscal Year
FYDP	Future Years Defense Program

G

GBS	Global Broadcast System
GLTRS	Global Launch and Test Range System
GMTI	Ground Moving Target Indicator
GPS	Global Positioning System

H

HQ	Headquarters

I

ICBM	Intercontinental Ballistic Missile
IIA	Integrated Investment Analysis
IP3	Integrated Planning Process Pathfinder
IPP	Integrated Planning Process
ISCN	Integrated Satellite Control Network
ISR	Intelligence, Surveillance and Reconnaissance

L

LBSD	Land Based Strategic Deterrence
LTRS	Launch and Test Range System

M

MAA	Mission Area Assessment
MAJCOM	Major Command
MAP	Mission Area Plan
MAT	Mission Area Team
MDA	Missile Defense Agency
MM	Minuteman
MNA	Mission Needs Analysis
MS	Mission Support
MS&A	Modeling, Simulation, and Analysis
MSA	Mission Solutions Analysis
MSP	Mission Support Plan

MUA	Military Utility Analysis

N

NASA	National Aeronautics and Space Administration
NAVWAR	Navigation Warfare
NOAA	National Oceanic and Atmospheric Administration
NORAD	North American Aerospace Defense Command
NPOESS	National Polar-orbiting Operational Environmental Satellite System
NPR	Nuclear Posture Review
NRO	National Reconnaissance Office

O

O&M	Operations and Maintenance
OCS	Offensive Counterspace
ORS	Operationally Responsive Spacelift

P

PED	Process, Exploit, and Disseminate
PNT	Positioning, Navigation and Timing

R

R&D	Research and Development
RAIDRS	Rapid Attack Identification, Detection, and Reporting System

S

S&C4ISR	Space and Command, Control, Communication, Computers, Intelligence Surveillance & Reconnaissance
S&T	Science and Technology
SATCOM	Satellite Communications
SBIRS	Space-Based Infrared System
SBR	Space Based Radar
SCC	Space Control Center
SCOUT	Space Command Optimization of Utility Toolkit
SFA	Space Force Application
SFE	Space Force Enhancement
SLEP	Service Life Extension Program
SMP	Strategic Master Plan
SOV	Space Operations Vehicle
SPAIF	Space Application and Integration Facility
SS	Space Support
SSA	Space Situation Awareness
SSAIC	Space System Attack Identification and Characterization
SSN	Space Surveillance Network
STEDE	Space Training, Education, and Exercise
STSS	Space Tracking and Surveillance System
STTR	Space Test and Training Range
SWC	Space Warfare Center

T

TCA	Transformational Communication Architecture
TENCAP	Tactical Exploitation of National Capabilities
TOA	Total Obligation Authority
TSAT	Transformational Satellite Communications System

U

UN	United Nations
US	United States
USSPACECOM	United States Space Command
USSTRATCOM	United States Strategic Command

W

WGS	Wideband Gapfiller System

APPENDIX C: INTEGRATED PLANNING PROCESS RESULTS

APPENDIX D: AIR FORCE CAPABILITIES CONOPS LINKAGES

APPENDIX E: SCIENCE & TECHNOLOGY PROCESS

APPENDIX F: DISTRIBUTION LIST

APPENDIX G: SPACE FORCE ENHANCEMENT MAP

APPENDIX H: COUNTERSPACE MAP

APPENDIX I: SPACE FORCE APPLICATION MAP

APPENDIX J: SPACE SUPPORT MAP

APPENDIX K: MISSION SUPPORT PLAN