

AU/ACSC/190/1998-04

AIR COMMAND AND STAFF COLLEGE

AIR UNIVERSITY

**AEROSPACE POLICY INTEGRATION:
USAF OPERATIONAL IMPACTS IN THE AGE OF SPACE**

by

Mark Michael McLeod, Major, USAF

A Research Report Submitted to the Faculty

In Partial Fulfillment of the Graduation Requirements

Advisor: Major Michael Foster

Maxwell Air Force Base, Alabama

April 1998

Disclaimer

The views expressed in this academic research paper are those of the author and do not reflect the official policy or position of the US government or the Department of Defense. In accordance with Air Force Instruction 51-303, it is not copyrighted, but is the property of the United States government.

Contents

	<i>Page</i>
DISCLAIMER	ii
LIST OF ILLUSTRATIONS.....	vi
LIST OF TABLES	vi
PREFACE.....	vii
ACKNOWLEDGMENTS.....	viii
ABSTRACT	ix
WHAT IS PUBLIC POLICY?	1
Environment of Public Policy.....	2
Fragmentation	2
Separation of Powers.....	2
Subgovernments.....	3
DEFINING THE ANALYSIS MODELS	5
Hood Analysis.....	6
Unitary administration.....	6
Uniform norms and rules of administration.....	6
No resistance to commands	6
Perfect information and communication	7
Adequate time to implement the program.	7
Values as the Basis for Success Determination.....	7
Defining the Model Values.....	8
CASE STUDY 1: DOES THE US HAVE A NATIONAL AIR POLICY?	10
Five Components of National Aviation Policy.....	11
Hood Analysis.....	12
Unitary Administration.....	12
Uniform Norms and Rules of Administration	12
No Resistance to Commands	13
Perfect Information and Communications.....	13
Adequate Time to Implement Program	13
Non-utilitarian Value Analysis	14
An Explanation	15

CASE STUDY 2: DOES THE US HAVE A NATIONAL SPACE POLICY?	17
Hood Analysis.....	17
Unitary administration.....	17
Uniform norms and rules of administration.....	18
No resistance to commands	18
Perfect information and communication	18
Adequate time to implement program.....	18
Non-utilitarian Value Analysis Estimation	19
How Does It Compare To Air Policy?	19
Expectations for Success	20
An Opportunity for Policy Integration	20
THE PROS AND CONS OF POLICY INTEGRATION	21
Pros.....	21
Cons.....	24
Overall Assessment: Integrate	25
Precedent for taking these steps.....	25
Historical Temperament	26
IMPACT OF INTEGRATED POLICY ON FUTURE AIR FORCE	
OPERATIONS.....	28
The Focus	28
Changing Air Force Functions.....	29
Impacts to roles and missions.....	30
Why the current approach won't work	31
CONCLUSIONS.....	33
Recommendation Number 1: Divest the Close Air Support Mission.....	34
Recommendation Number 2: Divest Involvement in Space Launch.....	34
Recommendation Number 3: Divest Base Operability and Defense Mission	35
Will the Desire for Efficiency Affect Combat Operations?	35
BIBLIOGRAPHY	37

Illustrations

	<i>Page</i>
Figure 1. Case Study 1 Value Analysis Summary	14
Figure 2. Case Study 2 Value Analysis Summary (Success Probability)	19

Tables

	<i>Page</i>
Table 1. Congressional Aviation Policy Board’s Major Tenets of Air Policy	11
Table 2. Roles and Typical Missions of Aerospace Power.....	30

Preface

The resources needed for defense continue to decline. At the same time, our involvement in world contingencies (and projected future involvement) continues to be high, as do the costs of force modernization and development. While we all realize that smaller budgets demand streamlining, what is not clear is whether our drive for efficiencies will significantly affect doctrine or combat operations.

Our current environment, with the Air Force poised on the verge of expanded space based operations, raises some dilemmas for planners. How will limited budgets affect our exploitation of air and space? Should we pool limited national resources, in the form of integrated national air and space policy, to maximize our efforts? This environment prompted the Institute for National Security Studies to ask for a study on whether there should be a single, or integrated, national air and space policy. I am addressing this question by comparing existing air and space policies, analyzing the rationale for combining policies, and forecasting impacts to future Air Force doctrine. The conclusions may help current planners evolve future Air Force operations.

Acknowledgments

I wish to acknowledge the invaluable assistance of my faculty research advisor on this project. Major Michael Foster's suggestions for analysis tools and oversight of the project were important contributors to the development of our final product.

Abstract

How will limited budgets affect the future exploitation of air and space? This question is extremely relevant to Air Force planners today. Some are now suggesting the integration of existing air and space policy, in an effort to maximize limited resources. This paper seeks answers to these questions through analysis of each public policy, offering three effects integrated policy may have on future Air Force operations.

Public policy is all about what you can do for citizens. Determining the probable success of policies is not easy, given our political system, and the difficulty in capturing costs and assigning values to perceived benefits. For these reasons, this paper uses political science based administrative and values analysis tools to extrapolate success.

The analysis of national air policy found it highly effective. The second analysis, an extrapolation of expected results for space policy, uncovered a lower chance for success. This was based on a comparison of the two case studies, which highlighted resource availability as an important success determinant. This formed the basis of arguments for integrated policy, and all subsequent doctrine recommendations

The research supports arguments for adopting an integrated policy, and provides the rationale for three changes to Air Force doctrine, roles and missions; transfer of the responsibility for close air support, reevaluation of space launch support activities, and modification of the requirements for base operability and defense. Divestiture of these functions better focuses the Air Force on its unique core competencies in the future.

Chapter 1

What is Public Policy?

If a vigorous program is desired...seek ways to have such a program by coping with political realities...planning programs that can adapt to the kinds of changes that seem inevitable in our system, rather than blaming the system when (it) fails.

—James Fletcher

To fully analyze the success of public policy in the United States, it is important to understand the environment in which policy operates. Public policy is the sum of government activities, whether acting directly or through agents, that has an influence on the lives of citizens¹. Although focused on the federal level, the U.S. is a federal system of government made up of a much larger number of subnational governments, which also make decisions. Even when they attempt to cooperate, these government agencies often experience conflicts over policy. Normally, attention is concentrated on the effects of government choices on the lives of individuals within the society. However, government employees do not implement all government policies. Many are actually carried out by private organizations, such as an aircraft manufacturer constructing products to meet federal standards. Knowing this helps to avoid the excessively narrow definition of public policy as concerning only those programs directly administered by a public agency².

This concept of policy also points to the frequent failure of government to coordinate programs, with the consequence that programs cancel out one another or have duplication of effort. In the end, policy results from a complex set of interactions among a number of equally complex institutions. It involves a wide range of values about what policy goals should be, and the best means for reaching those goals.

Environment of Public Policy

Three major characteristics, fragmentation, separation of powers, and subgovernment implementation, characterize the implementation structure for public policy. It is important to comprehend the nature of each aspect, since each imposes its own set of limitations on policy administration.

Fragmentation

Power is divided among the central government, and further between the central, state, and local governments. This system has advantages, in that multiple decision-makers are involved in every decision, and all must agree before a proposal can become law or can be implemented. The existence of multiple decision-makers can also permit innovation in the federal government³. This system also has drawbacks, gridlock being foremost. All too often political organizations demand the right to closely monitor programs, even if the best way would be a no strings attached approach like block grants to states for welfare or education funding.

Separation of Powers

The U.S. distributes power in the federal government among three branches, each applying checks and balances to the other two. While this approach has proven

successful in our history, it may no longer be the decisive government required in the late 20th century.⁴ While the lack of system efficiency is arguable, one principle result is the necessity to form coalitions across a number of institutions and interests. The outcome is a tendency to produce small, incremental changes, rather than large policy changes.⁵

Subgovernments

The third division cuts across institutional lines within the federal government. The three principle actors are special interest groups, congressional committees, and various administrative agencies (e.g. Department of Defense, Transportation, and Commerce). While all have similar interests, priorities and outcomes change during execution.

More often than not, policy outputs are not made by any central authority, but by aggressive subordinate organizations. In other words, bureaucratic agencies and their associated special interests and committees are in charge. The effects of this particular aspect of government appear in the incoherence of policy, with interests served at the expense of the public. The point to remember is whenever large numbers of official actors involve themselves in the process, the process becomes more difficult.

This short discussion on the structure of policy implementation clearly demonstrates the limitations government places on successful policy execution. Any policy development or integration should be viewed in light of these limitations. This discussion also introduces an idea prominent in many circles today: effective policy implementation requires streamlined organizations. With that overview as background, the attention now turns to the development of an analysis methodology.

Notes

¹ Guy B. Peters, *American Public Policy: Promise and Performance*, 4th edition (New Jersey: Chatham House Publishers, 1982), 2.

²Theodore J. Lowi, "American Business, Public Policy, Case Studies, and Political Theory," *World Politics*, July 1964, 161-187.

³ Guy B. Peters, *American Public Policy: Promise and Performance*, 4th edition (New Jersey: Chatham House Publishers, 1982), 10.

⁴ Fiorina P. Morris, "An Era of Divided Government," *Political Science Quarterly* June 1992, 387-410.

⁵ Michael T. Hayes, *Incrementalism* (New York.: Longman Publishers, 1992), 172.

Chapter 2

Defining the Analysis Models

Political studies suffer from overemphasizing science while paying insufficient attention to the realm of morals, where men may be impelled to behave well and inspired to resist wrongdoing.

—David M. Ricci

In an ideal world, governments march to a single drum beat and implement policy efficiently. Given the complexity of public bureaucracy, the probability of policy success is in question.¹ This is not due to the inability of the bureaucracy, but the internal dynamics of large organizations. In order to analyze policies in this system, it is necessary to use two perspectives. The first is the Hood model, which analyzes policy administration from five separate...but interrelated aspects. Understanding and mitigating these factors in a solution is important if successful implementation is to occur.

While understanding and mitigating the effects of the environment are important to successful implementation, determining and forecasting actual success requires the use of a second analysis product. Traditionally either a cost-benefit utilitarian or values-based non-utilitarian model serve this purpose. The non-utilitarian model is used here, as it encompasses more public policy values than simple economic advantage.

Hood Analysis

Christopher Hood, in *The Limits of Administration*, identifies five areas where policy problems develop in his model of “perfect” policy implementation.²

Unitary administration

Governments rarely have unitary administrations. Decisions are made in national capitols, but implementation is by divisions and field staffs. A change in central values, such as a new administration, may or may not change the focus of the agency.³ One solution is not rigorous centralized control, but a flexible approach that encourages compliance with the spirit and intent of well designed policy.

Uniform norms and rules of administration

Subgovernments develop standard operating procedures to respond to problems.⁴ While good for existing programs, standard procedures often act as implementation barriers for new policies. Thus for new programs, there is a need for designing programs that more consistently reassess goals. Negating this effect requires the creation of new organizations, or overarching policy such as joint doctrine, which acts to guide independent organizations toward common goals.

No resistance to commands

Even when there is unity of administration and rules, not everyone will agree with the course of action selected.⁵ Political, military, and personal biases all can combine to create resistance to commands in any organization. There is also the aspect of disunity due to conflicting objectives. Agencies survive by getting money and personnel. When basic cooperation threatens interests, people are less likely to participate.

Perfect information and communication

Bureaucracies are subject to inaccurate and blocked communications.⁶ The inability to gather and process information is a detriment to performance. Common training, flatter organizations (e.g. fewer layers of communication), and creating redundant communication channels are ways around this problem.

Adequate time to implement the program.

Although most organizations can succeed if given enough time to solve a problem, their responses often lag behind the need for the response.⁷ Clearly, the accelerating pace of change is making success more difficult to achieve. The problem is identifying solutions by dealing with past problems, rather than current or projected conditions.

This model provides one means of analyzing and determining the likelihood of successful policy implementation, based on efforts to mitigate each factor. Since it looks at the problem only from the aspect of the implementation mechanism, it is necessary to include the second model to capture the value payoffs to fully determine potential policy success.

Values as the Basis for Success Determination

Values are important in any system, because they help shape the institution and its policy outputs.⁸ While the conception is that government should do what creates the greatest economic value for the society (cost benefit or utilitarian approach), it is difficult to apply in this situation because of the far-reaching nature of air and space policy. Determining the financial impact thus becomes a daunting task. Cost benefit also reduces all government action to economics, ignoring other equally important values in determining a course of action. This leads to the analysis concept of non-utilitarianism.⁹

Non-utilitarianism seeks to present ethical values as alternatives to cost-benefit analyses. These values serve to guide decisions and determine policy success. The main challenge in ethical analysis of policy decisions is finding a common set of values applicable to a number of situations.

Defining the Model Values

The way values manifest themselves in the public debate varies over time. Different periods present their own conflicts and problems, spawning their own values. However, there are basic consistencies across time. In this study, four values provide a representative basis for analysis of public policy success.

The first is security. The care of human life, as Thomas Jefferson said, is the first and only legitimate object of good government.¹⁰ Preservation of life is the fundamental value in the policy process.

Social is the second model value category. This involves the public standards for the use of scarce resources.¹¹ This category provides an excellent example of how values change over time. For example, if you were to ask people 50 years ago whether the government or private sector was in a better position to solve the nation's problems, their response would probably be different than a group asked today.

The third model value is economic growth. Programs should provide benefits to society, to include jobs, personal and national wealth. While economic growth as a value does not scientifically capture the cost-benefits involved, it does allow for the consideration of economic influence in the equation.

The final value is technology. The intrinsic value of technology is the way its risks are assessed by government agencies.¹² For example, if we choose not to pursue a

capability, then others may at detriment to the United States economically or militarily. Technology translates into control and power, and so has a discernable value orientation.

In summary, the Hood and non-utilitarian analyses look at an organization's capacity to implement policy. The Hood model highlights areas where implementation barriers exist, identifying shortcomings that can serve as predictive indicators of the comparative likelihood of new policy success. For example, if the government does not attempt to mitigate the Hood factors, any chance of future success becomes comparatively lower. Similarly, the non-utilitarian analysis studies policy on the basis of value payback to the public. Any changes in values, or changes to factors that effect these values, allow for comparative determinations of future implementation success. Thus the stage is set to analyze the first of the two case studies; namely national air policy.

Notes

¹ Guy B. Peters, *American Public Policy: Promise and Performance*, 4th edition (New Jersey: Chatham House Publishers, 1982), 44.

² Christopher Hood, *The Limits of Administration* (New York: Wiley, 1976), 31-45. Christopher Hood is Professor of Public Administration and Public Policy in the University of London, and has held a similar position at the University of Glasgow. He is a recognized expert in the field of public policy administration, with numerous published books and articles to his credit.

³ Guy B. Peters, *American Public Policy: Promise and Performance*, 4th edition (New Jersey: Chatham House Publishers, 1982), p 54.

⁴ Ibid, p 56.

⁵ Ibid, p 58.

⁶ Ibid, p 60.

⁷ Ibid, p 62.

⁸ Gillian Peele, Christopher J. Bailey, and Bruce Cain, *Developments in American Politics* (New York: St. Martin's Press, 1994),

⁹ Russell Hardin, *Morality Within the Limits of Reason* (Chicago: University of Chicago Press, 1988), 18.

¹⁰ Kenneth R. Stunkel and Sarsar Saliba, *Ideology, Values, and Technology in Political Life* (New York: University Press of America, 1994), 47.

¹¹ Ibid, 47-48.

¹² Ibid, 86.

Chapter 3

Case Study 1: Does the US Have A National Air Policy?

It is self-evident that search for a national air policy for the United States must seek to explore all the facts. It must uncover all the facts and coordinate them if a pattern of national security and civil progress is to result.

—National Aviation Policy Board, 1948

Within two years after World War II, concern over national security, and the threatened bankruptcy of the aircraft industry brought about a review of national aviation policy by the Congress. The biggest problem was providing for well-balanced military air forces, rather than maintaining the aircraft industry. If the former were accomplished, the latter's health would be assured.¹ Those interested in U.S. freedom had no other choice but to maintain military and civil air at a level capable of ensuring no sudden attack upon the American people could succeed. National air power was thus not a divisible commodity. Materials, organization, weapons, and carriers intertwined in an industry that could readily turn out combat planes or commercial transports.

The efforts of the Congressional Aviation Policy Board, the initial developers of national air policy, were geared towards building the strong and modern civil aviation component essential to air power for national security.² Their missions were to preserve national security, and promote social and economic welfare. The scope of this effort can be seen in figure 1, which depicts the wide range of aspects addressed in the policy.

Table 1. Congressional Aviation Policy Board’s Major Tenets of Air Policy

Coordinate costs with all government expenditures – both domestic and foreign
Maintain military air power to control all necessary air spaces
Foster and coordinate scientific research to maintain U.S. leadership
Maintain civil air system to ensure safety and certainty
Maintain production status and expandability of aviation industry
Promote domestic and foreign air commerce
Regard small business aviation as a national asset
Define roles specific for Secretaries of State/Defense/Commerce
Establish an aeronautical education program throughout the public school system

Five Components of National Aviation Policy

There were five primary recommendations within the new policy.³ The first concerned combat aviation, or promotion of national security issues. This was an effort to accurately determine military aviation requirements for the Air Force and Navy. Even then, there was controversy between the services regarding roles and missions, and the board recommended clarifying issues through review of the National Security Act of 1947.⁴

Air transport was the next category, with the board concluding civil and military aviation were indivisible. National security required a financially sound and technically modern transport industry. Such a fleet would serve peacetime commerce and industry, while remaining available for immediate conversion to military use.

The other three aspects were aircraft manufacturing, research and development (R&D), and government organization. Given the World War II model, the United States could not afford to maintain in peacetime the Air Force required to win a war. Therefore, plans for expanding wartime production were integral to air policy. R&D followed this goal, where the board felt technical preeminence was fundamental, and possible only through intensive program financing. Finally, government organization referred to the

need for stable operating policies. This aspect called for statutes for interagency cooperation, clarifying responsibilities, and establishing an independent air safety agency. These aspects of air policy laid out an aggressive and far-reaching plan. The analysis of implementation of the air policy, and its overall success, concludes this chapter.

Hood Analysis

Analysis of Hood's five characteristics of perfect organizations serves two purposes. It characterizes the public policy implementation environment, and highlights any measures taken to address the problem areas. This will allow us to extrapolate, based on a comparative determination of air and space environments, the success of separate space policy.

Unitary Administration

There was leadership disagreement on the best course of action for the military. Congressional efforts to establish centralized control eventually led to service competition and choices of one weapon system over another, vice what may have been the correct system for the need. An example is the atomic policy adopted during the 1950's, which drove force composition. Traditionalists believed "force" meant conventional heavy bombers, rather than ballistic missiles. These types of doctrinal decisions would have negative Air Force impacts in both Korea and Vietnam.

Uniform Norms and Rules of Administration

There were a variety of administrative barriers to good implementation, particularly when new approaches were under consideration. Although the 1947 National Security Act sought to create new organizations to address these problems, it addressed only the

military side of the coin. Even in this limited role, Navy and Air Force conflict on the interpretation over airpower roles and missions illustrate its level of conflict.

No Resistance to Commands

Congressional and military influence concerning the buildup of the Strategic Air Command was a shaping factor in the determination of force structure and resource expenditures in the late 1940's, and was a significant source of resistance. Of particular importance was the fact that each service was striving to survive, and in the case of the Air Force to grow, in a changing strategic environment. These were important factors in the 1950 admiral's revolt, and the 1957 rebellion of the Army generals.⁵

Perfect Information and Communications

The sheer level of decentralization in execution introduced significant amounts of complexity into information and communications. This led to a variety of independent efforts to develop similar services among competing organizations, like the development of the world's largest airline-type flying service in the military air transport system.⁶

Adequate Time to Implement Program

The quickening speed of technological advance, coupled with a government that clearly looked to the past for solutions to the future, made it more difficult to respond to needs over time. The explosive rise of the Soviet Union in space and the development of European government sponsored corporations like Aerospatiale and Airbus filled the void. Despite some setbacks however, the U.S. has retained its position of dominance.

The Hood Analysis shows air policy suffered inefficiencies despite efforts at mitigation. Did this lack of a strong and cohesive administration vehicle have an impact on the success of the policy? The answer to that question lies in the value analysis.

Non-utilitarian Value Analysis

The results of the value analysis are summarized in figure 2.⁷ The security of the U.S. was not compromised under this policy. Government sponsored nuclear research kept the Soviet Union at bay in the Cold War. Advanced technology and aircraft manufacturing were important aspects of air superiority in both Korea and Vietnam, while commercial reserve aircraft were vital to the successful air bridge during the gulf war. The system created flexible solutions to a variety of unique problems.

- | | |
|-------------------|-----------------------|
| • Security | Highly Successful |
| • Social | Moderately Successful |
| • Economic Growth | Highly Successful |
| • Technology | Highly Successful |

Figure 1. Case Study 1 Value Analysis Summary

The countries social values have changed. The government, up until perhaps the second term of President Reagan, was seen as a problem solving organization. They were able to devote vast resources to achieve air policy goals. Deficit spending (not limited to air policy) proved to have limits, the repercussions of which continue today.

It is hard to argue with the economic growth achieved by air policy. According to the State Department, the airline passenger industry alone generated over \$1 trillion in economic activity and more than 22 million jobs in 1996.⁸ Although there have been tough times (deregulation, for example) the overall program has been highly successful.

Technologically, the US remains in a position of world superiority. Militarily, ballistic missiles and the space program spawned out of this system. Commercially, the resurgence of Boeing as an aircraft manufacturer, and advanced aircraft avionics innovation are examples which continue to lead the way into the future.⁹

Thus overall, air policy has been highly successful. Given the expectation that inefficient government might influence the outcome of this policy negatively, why was it so successful? The missing element appears to be the availability of resources.

An Explanation

Traditional political system patterns do not seem to completely explain the success of national air policy in the United States. Dawson and Robinson support this conclusion in studies, which show competition, interest group demands, and decisional-system characteristics contribute to, but do not fully explain variations in policy outputs.¹⁰ What matters are the system resources, as wealth accounts for political-system characteristics and outputs.¹¹ The availability of large budgets (to include deficit spending) clearly influenced the process. This was unquestionably a factor in the success of air policy, and is a lesson to carry forward into the analysis of national space policy.

Notes

¹ U.S. President's Air Policy Commission, *Survival in the Air Age* (Washington, D.C., Government Printing Office, 1948), 1.

² *Ibid*, 4.

³ *Ibid*, 5. The Congressional Aviation Policy Board took the nine identified concept goals and formed five major conclusions. These five specific recommendations encompassed a broad air policy to coordinate all phases of air power.

⁴ *Ibid*, 6-7.

⁵ Eugene E. Wilson, *Kitty Hawk to Sputnik to Polaris* (Cambridge, MA: Barre Gazette, 1960), 81.

⁶ *Ibid*, 79-80.

Notes

⁷ These results are my compilation of perceived benefits based on referenced readings and examples. They are assigned the subjective ratings of low, moderate, or high success in order to characterize overall success and provide a means of comparison between air and subsequent space policies.

⁸ Bureau of Economic and Business Affairs: *U.S. Civil Aviation Policy Goals*, n.p., on-line, Internet, 13 November 1997, available from <http://www.state.gov/www/issues/economics/aviapol.html>.

⁹ CNNfn, *Boeing Profits Fall 15 Percent, But Sales Surge 48 Percent*, n.p., on-line, Internet, 18 Feb 98, available from <http://europe.cnnfn.com/hotstories/companies/9707/21/boeing/index.htm>. Sales at the Seattle-based company surged 48 percent to \$9.3 billion through July 1997.

¹⁰ Richard E. Dawson and James A. Robinson, "Inter-Party Competition, Economic Variables, and Welfare Policies in the American States," *Journal of Politics*, no 25 (May 1963): 265-289.

¹¹ Austin Ranney, ed., *Political Science and Public Policy* (Chicago: Markham Publishing Co., 1992), 164-165.

Chapter 4

Case Study 2: Does the US Have a National Space Policy?

The true processe of English policie, is this that who seeth South, North, East, and West, Cherish Marchandise, keepe the admiraltie, that wee bee masters of the narrow sea

—Hakluyt

Success in the air was due to a strong relationship with commerce. As Hakluyt's quote implies, sea power for commerce, not conquest, was the proven way to dominate the medium.¹ This same spirit moves the U.S. into the future of space.

The White House's national space policy identifies five program goals. They are to enhance knowledge through exploration, strengthen security, enhance economic competitiveness, encourage investment, and promote international cooperation to further policies.² Responsibility is divided between the National Aeronautics and Space Administration (NASA) for civil, Secretary of Defense and Director, Central Intelligence for national security, and Department of Transportation for commercial space.

Hood Analysis

Unitary administration

The complexity of government continues to grow. Special interest groups exert tremendous power in the development and execution of policy. The V-22 Osprey and

B-2 bomber, programs dismissed at one time or another as unnecessary by military leadership, continue to illustrate the lack of unitary administration.

Uniform norms and rules of administration

Although the government has streamlined, subgovernment competition continues. For example, NASA, DOD, and private industry all compete for space launch. There are ongoing efforts, like the Joint Requirements Oversight Council, which involve new organizations continually reassessing goals. However, they remain isolated within subgovernments, and do not yet cut across all the organizations involved in space.

No resistance to commands

There is great budgetary debate on the size of the military, and nature of space expenditures. Current policies continue to reshape government and create resistance. The 1986 Goldwater-Nichols Act, which a decade later provides the DOD with a template for joint training and increased cooperation, may be a model the government can use horizontally across government organizations to mitigate this problem.

Perfect information and communication

The success of current space policy depends on interagency working groups made up of all the involved organizations. Despite what appears to be a major step forward for integrated space management, responsibilities remain vested in government departments, which must continue to fight for their own survival with funds and personnel.

Adequate time to implement program

The end of the Cold War not only marked a change in the strategic environment, but a new private sector era in space. Telecommunications and earth orbit observation

satellites are opening the medium to a variety of worldwide players capable and willing to meet customers needs in space. Those who act quickly can exploit these opportunities.

In summary, the space policy environment, despite some efforts to mitigate problem areas, is comparatively more constrained because of inadequate time.

Non-utilitarian Value Analysis Estimation

The preservation of life is prominent in this policy, with a commitment to develop space for national security. Economic growth and technology are judged high. United States companies generated \$7 billion in revenues in 1995 according to the Dept of Commerce, with greater projections every year beyond.³ The potential technology rewards in space (i.e., improved crystals, communication, materials, and advanced propulsion systems) are lucrative. The probability of success is summarized in figure 3.

- | | |
|-------------------|------|
| • Security | High |
| • Social | Low |
| • Economic Growth | High |
| • Technology | High |

Figure 2. Case Study 2 Value Analysis Summary (Success Probability)

Social values for space policy rate lower than for air policy. Not all American people look at the government as a positive catalyst for change. Harsh economic realities foster a belief that effective solutions lie outside of government. Thus, there is a move afoot, within all levels of government, to privatize operations to reduce budgets.

How Does It Compare To Air Policy?

There are significant similarities between the two policies. National security is foremost, as are scientific R&D, economic growth, and technology advancement. Both also share the vision of open skies for international cooperation. The differences, at an

overall goal level, are insignificant. Space policy wants to enhance knowledge through exploration, while air policy has no current corollary goal.

From the analysis perspective, both have common oversight, not to mention great similarities in security, economic, and technological value assessments. The major differences are the changing social values related to government solutions, and limited resources (as identified in chapter 2).

Expectations for Success

Space policy today is based on the successful air policy model, with similar success expectations. This may be a false assumption based on this analysis. While space policy has great potential, it must contend with declining resources, and an implementation environment that has not adequately addressed its problems. It is thus reasonable to assign it a lower chance of success than air policy.

An Opportunity for Policy Integration

Considering the importance of resources on policy success, it makes sense to consider integration to maximize available resources. Since each policy shares many similar goals and objectives, implementation environments and values, there are a variety of arguments for and against policy integration. These arguments form the basis of the decision to integrate policies or have them remain separate.

Notes

¹ Wilson, Eugene E. Wilson, *Kitty Hawk to Sputnik to Polaris*. (Cambridge, Massachusetts, Barre Gazette, 1960), 25.

² White House, *Fact Sheet on National Space Policy*, n.p., on-line, Internet, 5 August 1994, available from <http://www.aiaa.org/policy/nat-space-policy.html>.

³ Christopher Myers and Jonathan Ball, *Trends in Commercial Space*, n.p., on-line, Internet, 10 Oct 97, available from <http://www.oasc.org/background.html>.

Chapter 5

The Pros and Cons of Policy Integration

Top management's real responsibility is a strategic architecture that guides competence building.

—C.K. Prahalad

The environment and value structure of air and space policy, specifically as they relate to available resources, provide an interesting backdrop for the policy integration discussion. It is through these lenses that we next explore the arguments for, and against integrated air and space policy.

Pros

There are five reasons why policy integration makes sense. First, it would allow for more efficient utilization of scarce government resources. By prioritizing the most important programs, and harmonizing all involved subgovernment organizations, the country could get the most for its taxpayer dollars.

Integration can also help avoid repeating old mistakes. Given the similarities between environments and values, it is logical to assume a similar number of successes and failures. Early emphasis on programs like strategic air power with atomic weapons, to the exclusion of the other elements of a balanced defense, contributed to airpower

difficulties in two subsequent wars and significantly influenced the economy. Doing things the “old” way is not a fresh look at the problem or its unique circumstances.

The third reason looks to provide a push from above.¹ Without integrated policy, the government will continue to implement policy in a non-unitary fashion, each organization working essentially independently towards goals and priorities. A program like the C-17 acquisition was a prime example. Industry offered the C-17, an upgraded C-5D, and a modified 747 as solutions to airlift shortfalls. Eventually, budgetary delays slowed the delivery schedule, causing program costs to spiral. The result was a planned buy of 240 reduced to 120.² The lack of a push from above resulted in a C-17 purchase that still does not meet our airlift requirements. Exploiting the future to its fullest capacity requires collective action.

The issue of competition or cooperation is the fourth argument. Policy integration offers the opportunity for formerly competitive government agencies to cooperate. A guiding document will have one major impact; acknowledging that the U.S. does not have unlimited resources to achieve its air and space goals. Some could argue that this process is already underway throughout government as we will discuss later. Vice President Gore’s Reinventing Government program, along with various restructuring and quality initiatives have increased the efficiency of government. While this is good, it does not go far enough. Suboptimization may deliver more effective competition for limited resources, but it does not guarantee effective implementation of public policy. The only way to achieve optimization is to develop a new paradigm of government cooperation across the various subgovernments.³

The final argument involves strengthening developing or existing relationships. Outsourcing and privatization are prevalent and well established across the entire spectrum of government and corporate America. Organizations are realizing that business outside of core competencies can probably be done better and more cheaply by someone else (vendor/contractor relationships). An integrated policy that promotes and invests in these opportunities is the best way to trim excess and non-value added costs.

Commercialization is a similar relationship borne out of technology growth and limited budgets. Commercial off-the-shelf products provide the affordable technology to meet modernization and weapon system acquisition needs, like the KC-10 aircraft, C-141 Glass cockpit, and the CF6-50 powerplants for the KC-135R engine replacement program. The same trend is emerging in space, where corporations like Lockheed run private-government remote sensing ventures for the Department of Commerce (DOC).⁴ In fact, the DOC is already tracking what they call new space, in an effort to anticipate the future and be the first to get there. There are also examples of successful public-private enterprises involving NASA that show cooperation can yield benefits for all players.

There is still a mindset, developed during the Cold War, which separates military and civilian. The effects of this paradigm continue today, as the DOD struggles to define the mechanism for space exploitation. As long as bureaucracies exist, they will strive to expand and protect their turf, hindering cooperative efforts and making them less productive than might otherwise occur. Policy integration will do nothing but promote these ideas further, leading to more efficiencies and capabilities in the future.

Cons

There are four arguments that support non-integration. The first is that existing organizations have proven track records. Strong arguments can be made that the various subgovernments have done a good job implementing air and space policy separately. The difficulty with this contention is that ends no longer appear supportable by the limited budget resource means. The U.S. has no sole title to air or space supremacy. Britain was once in this position in the early part of the century in relation to German, Japanese, and American Sea power.⁵ Many are the lessons of history where status quo provided an opportunity for a rival to develop.

The idea of the creation of “super-agencies” is the second argument against integration. A single aerospace policy could lead to the creation of a single agency to implement it, or at a minimum lead to significant cuts across multiple (redundant) organizations. The problem could become one of an agency becoming too big or strong, translating into more money and influence in government. This scenario is unlikely, given the reality of our government structure.

Others may argue that policy integration will cause priorities to suffer. Decisions concerning allocation of funds are difficult. The present day system tends to decrease the hurt by spreading the wealth around as much as practicable. The net effect is that most everyone gets a piece of the pie, but few are satisfied. This competition is made possible by subgovernments who fight for limited dollars, but do not make the critical decisions on what it is really needed. What is needed in this process is a vehicle that helps define what those needs are and then coordinates collective efforts to achieve them.

A good argument can also be made for the fourth argument against integration, namely that we are already doing this today. Despite a variety of successes on this front, government continues to operate on the fringes of integration. It continues to suboptimize individual agencies and departments in order to survive on limited budgets. This is not substantive progress. Given that the successful outcome of policy execution is resource dependent, optimization of the entire process is necessary in order to deliver maximum gains to the public.

Overall Assessment: Integrate

In order to realize the potential benefits of integration, organizations must be willing to embrace the philosophy and design programs and organizations that will more consistently reassess their goals and the methods they use to reach these goals. This may well be the right time to take on such an endeavor, given the relatively modest military threats facing the U.S. in the near term.⁶ This could provide the opportunity to push past where various institutional paradigms would otherwise hold. The call is not for revolutionary change, but evolutionary selection.

Precedent for taking these steps

According to C.K. Prahalad and Gary Hamel, professors at the University of Michigan and the London Business School, the best way to prevail in global competition is invisible to many organizations. During the 80's, corporations were judged on the ability to restructure and delay. In the 90's, they will be judged on the ability to identify and exploit core competencies that make growth possible.⁷ Could the same be true for the government corporation?

There are many examples of those who have rethought themselves...the Honda's and Cannons. What they found was competitiveness comes by building, at lower cost and more speedily, the core competencies that spawn unanticipated products. The Air Force appears to be in a very similar situation. Corporate lessons show that real advantage is found in the ability to consolidate competencies that empower individual businesses to adapt quickly to changing opportunities. Corporate pioneers step beyond the traditional boundaries of their organizations to tap into the vast technological resources available in many American and European companies. Can the Air Force do the same?

Historical Temperament

The United States not only has the capacity to accomplish its goals, but the technical expertise and representational government that allows the process to flourish as the strategic environment and values change. In the 20's and 30's, private and commercial aviation was the innovator. During World War II, government collaborated closely with industry to create a dominant force. More recently, government has led efforts to develop the space program. The relationship is changing again towards a private market contribution.

What has not changed is the need for national security. Despite the variety of means chosen, the ends remained the same. This is the U.S. historical temperament, and is the type of strength Alfred Thayer Mahan illustrated in his fifth and sixth elements of national power; character of the population and government.⁸ This character, and the associated changes it creates, can help drive changes to future Air Force operations.

Notes

¹ Roger Handberg, *The Future of the Space Industry: Private Enterprise and Public Policy* (West Port, CT: Quorum Books, 1995), 11.

² Original C-17 procurement documents called for a buy of 240 aircraft to replace the aging C-141 aircraft fleet. Various programming and contractor delays resulted in a modified buy of 120 aircraft. This information was gathered from various programming sources, to include the Air Mobility Master Plan, during my previous assignment on the Air Mobility Command staff at Scott AFB, IL.

³ Thomas S. Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 1962), viii-ix.

⁴ Patrick Seitz, "Remote Sensing and Earth Sciences: Private, Government Imagery Programs Can Co-exist", *Space News*, Apr 25-May 1, 1994, 79.

⁵ Eugene E. Wilson, *Kitty Hawk to Sputnik to Polaris* (Cambridge, MA., Barre Gazette, 1960), 125.

⁶ Andrew F. Krepinevich, *Restructuring for a New Era: Framing the Roles and Missions Debate* (Washington, D.C., Defense Budget Project, 1995), 1-4.

⁷ C.K. Prahalad and Gary Hamel, *The Core Competence of the Corporation*, *Harvard Business Review*, May-June 1990, 79-91.

Chapter 6

Impact of Integrated Policy on Future Air Force Operations

The swifter the pace of change, the more lovingly men had to care for and criticize their institutions to keep them intact through the turbulent passages.

—John Gardner

Although it is not within the scope of this paper to define what integrated policy would look like, several trends appear dominant. The need for subgovernment cooperation, new relationships and private sector influence, and the need to divest non-core value operations. If private industry is any indicator, integrated policy should have the effect of further redefining core competencies and operations.

Given limited budgets, core competency analysis appears necessary. According to Dr. Andrew Krepinevich, the current Air Force program is ill suited to prepare for the environment likely to emerge by 2016.¹ Krepinevich postulates concepts of basing, power projection, and airlift may change due to target vulnerability. Given this view, policy integration provides one way to make planning decisions. As an introduction to possible impacts, it is necessary to review core competencies to understand their purpose.

The Focus

Air Force Basic Doctrine defines core competencies as the heart of Air Force strategic perspective, and the service's contribution to nation's total military capabilities.²

They stem from two sources; a function only accomplished by, and functions conferring national advantage when performed by air and space forces. Core competencies are basic areas of expertise delivered across the range of military operations. The six competencies are; air and space superiority, precision engagement, information superiority, global attack, rapid global mobility, and agile combat support

This analysis seeks to identify those functions, within the core competencies, that the Air Force does not uniquely bring to the fight. The bottom line is ends should define means. In other words, the idea of integrated policy is not about which service employs what capability, but what must be achieved via maximum effectiveness and affordability.

Changing Air Force Functions

Air Force doctrine currently defines 17 functions of the Department of the Air Force.³ Applying the scrutiny of what the Air Force uniquely brings to the fight, two potential responsibility categories are highlighted: close air and logistics support, and launch and space support.

The first change involves the responsibility to provide close air and logistics support. More specifically, this includes airlift, resupply, photography, tactical reconnaissance, and interdiction of enemy land forces and communications. Most of these tasks support core competencies and address unique service capabilities. The exception is the interdiction of enemy land forces. The Air Force is no longer the only service capable of delivering this capability. The Marine Corps perform this for itself, and the Army possesses a credible rotary wing aircraft capability.

The second exception is launch and space support. While vital during the Cold War, this capability may no longer be necessary. A new strategic environment and limited

budgets offer an opportunity to reexamine Air Force involvement in launch operations. Current United States space management practices result from a launch philosophy emphasizing expensive payloads with low launch rates. We now face the task of retaining high-technology performance while attaining lower cost access to space.

The Air Force offers neither unique, nor cost-effective launch capability. The DOC has recognized new space as privately funded and commercial in nature.⁴ The philosophy that drove airline costs down 40 percent, and oil shipping costs by 75 percent since the 1960's is what can allow the DOD to use its dollars more wisely.⁵ Combining the best aspects of commercial and military programs is the mission of policy integration.

Impacts to roles and missions

Another way to analyze the impacts of integrated policy is to examine the roles and missions of aerospace power (figure 4) from the same “unique to the fight” perspective.

Table 2. Roles and Typical Missions of Aerospace Power.

ROLES	MISSIONS
AEROSPACE CONTROL	Counterair, Counterspace
FORCE APPLICATION	Strategic Attack, Interdiction, Close Air Support
FORCE ENHANCEMENT	Airlift, Air Refueling, Spacelift , Electronic Combat, Surveillance and Recon., SOF
FORCE SUPPORT	Base Operability and Defense , Logistics, Combat Support, On-orbit Support

One additional mission is illuminated under the light of the uniqueness test; base operability and defense. Given recent experiences with Khobar Towers and the federal building bombing in Oklahoma City, no one can argue the need for adequate force protection. While certainly a vital function, force protection is not a unique capability to the Air Force. The question should then become who is best suited for providing such a capability. Finding answers to questions like this begins to focus the beam of core competency where it belongs.

Why the current approach won't work

An integrated policy focusing on eliminating core competencies is not the current approach to the future. The United States defense program emphasizes a smaller, more efficient military, oriented toward familiar challenges (including expansion of operations other than war). In the May 1997 Report of the Quadrennial Defense Review, Secretary of Defense Cohen identified four actions necessary to achieve a 21st century defense infrastructure capable of supporting our military forces and operations. They are further civilian and military personnel reductions, additional base closures, adopting business practices within DOD support functions, and outsourcing non-warfighting functions.⁶

The prevailing attitude is to cover short-term requirements while developing the new technology and capabilities of the future. This approach is supported throughout the chain of command. In *Global Engagement: A Vision for the 21st Century*, there was an expansion of core competencies, with the Secretary of the Air Force championing the desire for existing processes and acquisition of new requirements at the same time. While these visions acknowledge the changing nature of the future strategic environment, they fail to accomplish the integration of efforts across the entire government,

suboptimizing (from a public policy standpoint) the process. The fact is, the Air Force is unlikely to retain its existing force structure, execute current recapitalization plans, and make the changes necessary to dominate future mediums all at once.

While the current approach attempts to account for the obvious resource deficiencies in the future, it falls short in the other three key identified public policy considerations highlighted in this paper. It does not fully account for the structural deficiencies in our government, adequately address changing social values, or exploit the need for refining and focusing core competencies.

Policy integration is a better approach. It not only addresses government shortcomings; it keeps the same emphasis on efficiencies, incorporates value changes through private sector solutions, and leads to core competency refinement. While there may be short-term risk associated with divesting missions, it will help free up the money necessary to fully capitalize on what experts feel is the next revolution in military affairs. Considering the current strategic environment, the time may be right for accepting this risk.

Notes

¹ Andrew F. Krepinevich Jr., *The Air Force of 2016* (Washington, D.C., Center for Strategic and Budgetary Assessments, 1996), 17-37.

² Air Force Doctrine Document 1, *Air Force Basic Doctrine*, September 1997, 27-35.

³ Air Force Manual (AFM) 1-1, *Basic Aerospace Doctrine of the United States Air Force*, volume 2, Essay L, March 1992, 103.

⁴ Mary L. Good and Keith Calhoun-Senghor, "New Space Era is Here-and It's Commercial", *Aviation Week & Space Technology*, 9 June 1997, 90.

⁵ Edward Hudgins, *Congressional Testimony: Recommendations Regarding NASA*, n.p., on-line, Internet, 2 February 1995, available from <http://www.cato.org/testimony/ct-hu-1/html>.

⁶ Department of Defense, *Report of the Quadrennial Defense Review*, May 1997, 53-55.

Chapter 7

Conclusions

In the long run, men only hit what they aim at.

—Thoreau

The Air Force is resigning itself to a smaller and more efficient force in the future, or what General Fogleman termed a “contraction in the uniformed force.”¹ The trick will be doing so while achieving an equal or greater level of effectiveness.

This analysis demonstrated one means of achieving this vision. It did so by studying the environment and values involved in public policy implementation. More importantly, the analysis highlighted the critical role that resources play on the execution of successful policy. Given that environment, the likelihood for success of future space policy was determined to be lower than national air policy. Policy integration was shown as a likely vehicle for success, based on these structural and resource limitations.

Nevertheless, policy integration alone is not enough. Corporate examples showed the key was focusing on the refinement of core competencies in order to derive competitiveness from building (at lower cost and more quickly) core competency capabilities. Based on the concept of determining what an organization “uniquely brings to the fight”, the analysis tested current Air Force primary roles and missions to identify non-critical functions. The process highlighted three doctrinal changes, which form the conclusions of this research effort.

Recommendation Number 1: Divest the Close Air Support Mission

Since close air support is no longer a unique capability of the USAF, the mission should be divested. This action would not significantly change the Air Force's ability to apply various weapon systems to provide such capability if the need arose, nor would it affect the ability to strike tactical, operational, or strategic targets. What it would do is allow for the creation of forces better able to support the other unique missions (strategic attack, interdiction, etc). This recommendation follows in the footsteps of Rand Corporation's "New Era Security" study, depicting a decline in the need for armies to prepare for close-maneuver ground combat and a similar decline in the need for air forces to plan and train for close air support.²

Recommendation Number 2: Divest Involvement in Space Launch

According to author Richard DalBello, really changing the way the U.S. manages launch system requires substantial alterations to the culture in both NASA and the Air Force.³ He lists two possible options. First, the U.S. could set up an independent government launch agency whose skills and creativity would be focused on the task of making launch operations more efficient and less costly. Second, the U.S. could turn launch operations for new systems over to the private sector and purchase launch services from the private sector for existing systems. The success of the European Space Agency's Ariane launch vehicle is evidence of the wisdom of separating the developers from the launch vehicle operators. The primary advantage to the Air Force is financial. The effect is increased availability of funds for other operational priorities.

Recommendation Number 3: Divest Base Operability and Defense Mission

Since base defense does not contribute directly, as a core competency, to the establishment or maintenance of air or space superiority, the mission should be divested. This is good candidate for privatization or outsourcing. This might include making the mission available to the Army, which has a well-established capability to provide this service, and whose core competencies better suit this mission. It could also include the development of new core competencies like long-range precision attack, which would eliminate the requirement for forward basing of Air Force assets.

Will the Desire for Efficiency Affect Combat Operations?

The initial premise of this research project was whether the desire for efficiencies would impact combat operations, given the fiscal and policy implementation constraints. The answer to this question is no, if public policy is integrated in such a way as to facilitate the correct determination of what is best for the country and its people. Efficiency in and about itself can be detrimental, if organizations sub-optimize their practices. Efficiency, if done successfully through cooperation and government-wide reform, may well be the means to achieving the future...not that, which prevents it.

Air and space policy integration offers the chance to achieve these efficiencies. It also offers minor changes in our roles, missions, and functions. This “conservative” view of the future is in keeping with some of the lessons of the past. As Mahan pointed out in his writings, “a vague feeling of contempt for the past, supposed to be obsolete, joins with natural indolence to blind men to those basic strategic lessons that lie close to the surface of all military history.”⁴ What he was saying is that “new” tends to replace “old”,

when in fact the lesson is that the basic truths of old still apply. That is why Clausewitz and Sun Tzu are still applicable today. While they might not have been able to dream of the technological wonders available today, their words are still relevant.

In order to continue to exploit air and space, as we have other opportunities such as sea power, mechanized armor and air power, we must incorporate them into the body of existing historical truth. As retired General Charles Horner said in a speech to the Heritage Foundation in the spring of 1997, “we need to divest ourselves of Cold War weapons, forces, and strategies. We are doing that to some extent, so it is not a question of are we going to do it. It’s a question of the pace at which we do it...”

Divesting these missions will cause minor changes to Air Force doctrine. However, coupled with government-wide efforts towards reform and efficiency, it will free the resources required to achieve and exploit the future to its fullest potential for the American people.

Notes

¹ John A. Tirpak, ed., “The Air Force Today and Tomorrow”, *Air Force Magazine*, January 1996, 20-26.

² Benjamin S. Lambeth, “Technology and Air War”, *Air Force Magazine*, November 1996, 53.

³ Radford Byerly, Jr., *Space Policy Reconsidered* (Boulder, CO: Westview Press, 1989), 76-77.

⁴ Eugene E. Wilson, *Kitty Hawk to Sputnik to Polaris* (Cambridge, MA., *Barre Gazette*, 1960), 123.

Bibliography

- Air Force Doctrine Document (AFDD) 1, *Air Force Basic Doctrine*. September 1997.
- Air Force Manual (AFM) 1-1, *Basic Aerospace Doctrine of the United States Air Force*. 2 vols., March 1992.
- Anderton, David A. *The History of the U.S. Air Force*. New York: Crescent Books, 1981.
- Bainbridge, William S. *The Spaceflight Revolution*. New York: John Wiley & Sons, 1976.
- Barnett, Jeffery R. *Future War: An Assessment of Aerospace Campaigns in 2010*. Maxwell AFB, Alabama: Air University Press, 1996.
- Berger, Peter L. *Pyramids of Sacrifice: Political Ethics and Social Change*. New York: Basic Books Inc., 1974.
- “Boeing Profits Fall 15 Percent, But Sales Surge 48 Percent.” *CNNfn*, 18 February 1998, n.p. On-line. Internet, 21 July 1997. Available from <http://europe.cnnfn.com/hotstories/companies/970721/boeing/index.htm>.
- Byerly, Radford, Jr. *Space Policy Reconsidered*. Boulder, CO: Westview Press, 1989.
- Carrell, John T. “Aerospace Power Makes the Difference.” *Air Force Magazine*: 79 (11 November 1996): 3-6.
- Commission to DOD. *Above all, Support Unified Commands*. Washington, D.C., Congressional Report, 24 May 95.
- Correll, John T. “The Command of Space: *Air Force Magazine*: 79, Iss: 10 (October 1996): 3.
- Dawson, Richard E., and James A. Robinson, “Inter-Party Competition, Economic Variables, and Welfare Policies in the American States.” *Journal of Politics*, 25 (May 1963): 265-289.
- Department of Defense. *Report of the Quadrennial Defense Review*: Washington, D.C.: Secretary of Defense, 1997.
- DOD Directive 5100.1. *Functions of the Department of Defense and Its Major Components*, 25 September 1987.
- “Fact Sheet on National Space Policy.” *White House*, 5 August 1994, n.p. On-line. Internet, 30 October 1997. Available from <http://www.state.gov/www/issues/economics/aviapol.html>.
- Good, Mary L., and Keith Calhoun-Senghor. “New Space Era is Here- and It’s Commercial.” *Aviation Week & Space Technology* (9 June 1997), 90.
- Grier, Peter. “The Arena of Space.” *Air Force Magazine* 79, Iss 9 (September 1996), 44-47.
- Handberg, Roger. *The Future of the Space Industry: Private Enterprise and Public Policy*. Westport, CT: Quorum Books, 1995.

- Hardin, Russell. *Morality within the Limit of Reason*. Chicago: University of Chicago Press, 1988.
- Hayes, Michael T. *Incrementalism*. New York: Free Press, 1992.
- Hood, Christopher. *The Limits of Administration*. New York: Wiley, 1976.
- Hudgins, Edward. Recommendations Regarding NASA. Congressional Testimony, 1 February 1995, n.p. On-line. Internet, 15 October 1997. Available from <http://www.cato.org/testimony/ct-hu-1/html>.
- Institute for National Strategic Studies. *1997 Strategic Assessment: Flashpoints and Force Structure*. Washington, D.C.: National Defense University, 1996.
- Krepinevich, Andrew F., Jr. *Restructuring for a New Era: Framing the Roles and Missions Debate*. Washington, D.C.: Defense Budget Project, April 1995.
- Krepinevich, Andrew F., Jr. *The Air Force of 2016*. Washington, D.C.: Center for Strategic and Budgetary Assessments, October 1996.
- Kuhn, Thomas S. *The Structure of Scientific Revolutions*. Chicago: University of Chicago Press, 1962.
- Lambeth, Benjamin S. "Technology and Air War." *Air Force Magazine* 79, Iss 11 (November 1996), 50-53.
- Lowi, Theodore J. "American Business, Public Policy, Case Studies, and Political Theory." *World Politics* 16 (July 1964), 677-715.
- Melanson, Philip H. *Knowledge, Politics and Public Policy*. Cambridge, MA: Winthrop Publishers Inc., 1984.
- Morris, Fiorina P. "An Era of Divided Government." *Political Science Quarterly* 107 (September 1992), 387-410.
- Myers, Christopher, and Jonathan Ball. *Trends in Commercial Space*. Department of Commerce, August 1996, n.p. On-line. Internet, 10 October 1997. Available from <http://www.oasg.org/background/html>.
- Peele, Gillian, Bailey, Christopher J. Bailey, and Bruce Cain, eds. *Developments in American Politics*. New York: St Martin's Press, 1994.
- Peters, B. Guy. *American Public Policy: Promise and Performance*. 4th ed. Newark, NJ: Chatham House Publishers, 1982.
- Prahalad, C.K., and Gary Hamel. "The Core Competence of the Corporation." *Harvard Business Review* (May-June 1990), 79-91.
- Ranney, Austin, ed. *Political Science and Public Policy*. Chicago: Markham Publishing, 1992. Seitz On-line. Internet, 4 September 1997. Available from <http://www.ff.org/heritage/library/categories/natsec/hl594.htm>.
- Tirpak, John A. "Future Engagement." *Air Force Magazine* 80, Iss: 1 (January 1997), 7.
- Tirpak, John A. "The Air Force Today and Tomorrow." *Air Force Magazine* 79, Iss: 1 (January 1996), 20-26.
- "U.S. Civil Aviation Policy Goals." *Bureau of Economic and Business Affairs*, August 1995, n.p. On-line. Internet, 13 November 1997. Available from <http://www.ff.org/heritage/library/categories/natsec/hl594.htm>.
- U.S. President's Air Policy Commission. *Survival In The Air Age*. Washington, D.C.: Government Printing Office, 1948.
- Webster's Third New International Dictionary, Merriam-Webster Inc, Publishers, Springfield, MA: 1995.

Wilson, Eugene E. *Kitty Hawk To Sputnik To Polaris*. Cambridge, MA: Barre Gazette, 1960.