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Appendixes

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How Can the Mobility Air Forces Better Support Adaptive Basing?

Appendixes A–C, Supporting Analyses of Adaptive Basing, Soft Power, and Historical Case Studies

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About This Report

A primary focus of the 2018 U.S. National Defense Strategy is the growing air and missile threat of potential adversaries. As a result, joint force development is focused on solving the operational problem of fighting effectively and winning in increasingly contested environments. This has led to the development of *adaptive basing* (AB) and other concepts that could reduce the vulnerability of U.S. forces while enhancing the warfighting capability through maneuver and other nonstandard approaches. AB and similar concepts call for force packages to operate in mobile and responsive ways to preserve critical U.S. combat capabilities and fight from positions of advantage. Many organizations are developing innovative AB concepts to address these issues. These concepts place demands on the U.S. Air Force's global mobility capabilities, but the effects on the Mobility Air Forces (MAF) have not been fully analyzed.

Air Mobility Command A5/8 (Strategic Plans, Requirements and Programs) asked RAND Project AIR FORCE (PAF) to assess the impact of AB concepts now being developed regarding the demand for MAF assets. This project specifically focuses on the MAF's current ability to support air refueling demand, airlift demand, and base enablers required by AB concepts and ways to enhance that capability. This project is intended to provide the analytical underpinning to help Air Mobility Command leaders move forward with modernization; capability development; implementation of new tactics, techniques, and procedures; and force structure planning decisions to enhance the ability of the MAF to support AB operations. This research should be of interest to personnel involved in adaptive basing operations, air refueling, airlift, logistics, sustainment, and base operations in the U.S. Air Force. The research is discussed in three companion reports:

- *How Can the Mobility Air Forces Better Support Adaptive Basing? Summary Analysis, Findings, and Recommendations*, RR-A1125-1, 2023. **This volume provides essential findings and recommendations for a broad audience, including U.S. Air Force decisionmakers.**
- *How Can the Mobility Air Forces Better Support Adaptive Basing? Appendixes A–C, Supporting Analyses of Adaptive Basing, Soft Power, and Historical Case Studies*, RR-A1125-2, 2023. This volume provides in-depth discussion of the AB concepts being developed, a detailed examination of the different types of power (hard, soft, and sharp) an adversary could exert on potential allies to limit U.S. base access, and historical case studies from World War II. **This volume is intended for military planners and analysts interested in AB concepts writ large, including political challenges and historical precedents.**
- *How Can the Mobility Air Forces Better Support Adaptive Basing? Appendixes D–I, Supporting Analyses of Tankers, Airlift, and Base Enablers*, forthcoming, Not available to the general public. This volume presents the detailed quantitative analysis underlying

our conclusions. **This volume is intended for the analyst community, as well as those interested in the details, approach, and assumptions of the analysis conducted.**

This report (Appendixes A, B, and C) presents supporting detail and additional context on the more qualitative parts of the analysis. Appendix A presents an overview of AB concepts being developed across the U.S. Air Force and explains how we selected AB concepts for analysis of MAF. Appendix B discusses different types of power (hard, soft, and sharp) that the Chinese government could use in the Pacific to complicate AB. Appendix C presents lessons from two historical case studies of Pacific operations in World War II.

The research reported here was commissioned by the director of strategic plans, requirements, and programs at Air Mobility Command and conducted within the Strategy and Doctrine Program of RAND Project AIR FORCE as part of a fiscal year 2019 project titled Rapid Global Mobility Support of Adaptive Basing Concepts. The views expressed in this report are those of the authors and do not reflect the official policy or position of the Department of Defense or the U.S. government.

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Additional information about PAF is available on our website:
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General Wood had the initial insight of the importance of this work and convincingly described it to a senior steering group, which resulted in project funding.

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Appendix A. What Is Adaptive Basing?

A primary focus of the 2018 National Defense Strategy is the growing air and missile threat of potential adversaries.[1] In response, the U.S. Air Force (USAF) and sister organizations have been developing adaptive basing (AB) and similar concepts that call for force packages to operate in mobile and responsive ways to preserve critical combat capabilities and fight from positions of advantage. Although these concepts place additional and different demands on USAF's global mobility capabilities, their effect on the Mobility Air Forces (MAF) had not been fully analyzed. Air Mobility Command asked the RAND Corporation to assess the impact on the MAF of AB concepts being developed to enable USAF to better operate in a contested environment. The main report presents the major findings of our analysis for a representative set of AB concepts in a Pacific theater vignette. This appendix provides broader background on AB concepts and their impact on mobility operations.[2]

AB as an Umbrella Concept

AB is USAF's attempt to rationalize and unify a range of concepts—some complementary, some competing—under one umbrella and into an AB warfighting tool kit.[3] The tool kit would offer combatant commanders a selection of warfighting instruments, including activities that may be considered truly adaptive (i.e., involving the dynamic movement of combat air forces [CAF] among multiple bases to complicate adversary targeting), as well as traditional static concepts (e.g., standoff, base hardening) that support an overall strategy of adaptation and increased survivability. AB also places renewed emphasis on the operational art of war: "the use of creative thinking by commanders and staffs to design strategies, campaigns, and major

[1] U.S. Department of Defense, *Summary of the 2018 National Defense Strategy of the United States of America, Sharpening the American Military's Competitive Edge*, Washington, D.C., 2018.

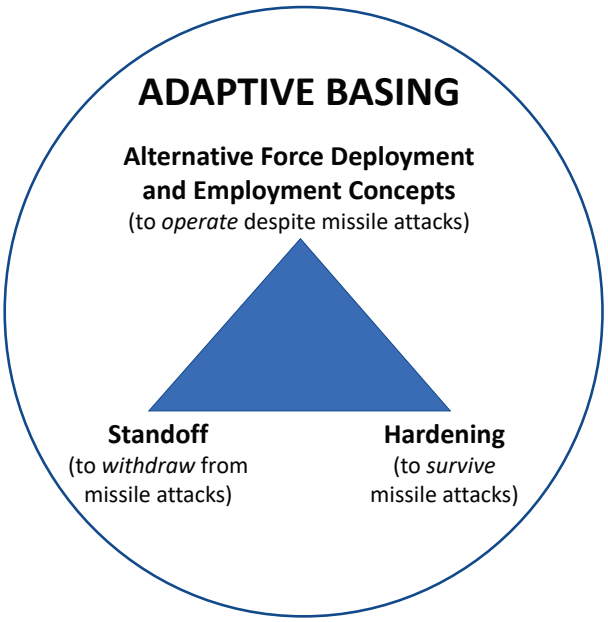
[2] David T. Orletsky, Jeffrey S. Brown, Bradley DeBlois, Patrick Mills, Daniel M. Norton, Julia Brackup, Christian Curriden, Adam R. Grissom, and Robert A. Guffey, *How Can the Mobility Air Forces Better Support Adaptive Basing? Summary Analysis, Findings, and Recommendations*, Santa Monica, Calif., RAND Corporation, RR-A1125-1, 2023.

[3] USAF has not released an official document on, or definition of, AB. Therefore, we attempt to synthesize many discussions with planners and logisticians, briefings on AB, reports from exercises and wargames, and information from other sources to distill the essence and salience of AB for the MAF community. This section draws heavily from Patrick Mills, James A. Leftwich, John G. Drew, Daniel P. Felten, Josh Girardini, John P. Godges, Michael J. Lostumbo, Anu Narayanan, Kristin Van Abel, Jonathan William Welburn, and Anna Jean Wirth, *Building Agile Combat Support Competencies to Enable Evolving Adaptive Basing Concepts*, Santa Monica, Calif.: RAND Corporation, RR-4200-AF, 2020.

operations and [to] organize and employ military forces."[4] Thus, AB would rely on new sets of warfighting tools, as well as new and creative ways of using those tools.

Figure A.1 illustrates the overall AB concept as a triangle that consists of standoff, base hardening, and alternative concepts of operations (CONOPs). The base of the triangle represents where most of the work in USAF has focused to date: on traditional standoff and hardening concepts.[5] *Standoff* refers to rearward basing strategies to *withdraw* forces from exposure to missile attacks. *Hardening* refers to forward-based protection and recovery strategies to *survive* missile attacks. The top of the triangle represents more-dynamic force deployment and employment concepts to help forward-based forces *operate* despite missile attacks. Research into this third, alternative, area of AB has been pursued in earnest only within the past several years.

Figure A.1. AB Encompasses a Variety of Concepts



[4] Joint Publication 3-0, *Joint Operations*, incorporating change 1, Washington, D.C.: Joint Chiefs of Staff, October 22, 2018.

[5] At RAND, much work on hardening and standoff options was accomplished under the Combat Operations in Denied Environments (CODE) umbrella of projects. For a discussion of findings and lessons learned from years of CODE work, along with an annotated bibliography of recent CODE reports, see Robert S. Tripp, Alan J. Vick, Jacob L. Heim, and James A. Leftwich, *Increasing Air Base Resilience to Missile Attacks: Lessons Learned from RAND Analyses on Combat Operations in Denied Environments*, Santa Monica, Calif.: RAND Corporation, 2022, Not available to the general public. These projects that are specifically focused on air base attack have been ongoing for more than five years and have been conducted for multiple USAF and joint sponsors. Also, David T. Orletsky, Michael Kennedy, Bradley DeBlois, Daniel M. Norton, Richard Mason, Dahlia Anne Goldfeld, Andrew Karode, Jeff Hagen, James S. Chow, James Williams, Alexander C. Hou, and Michael J. Lostumbo, *Options to Enhance Air Mobility in Anti-Access/Area Denial Environments*, Santa Monica, Calif.: RAND Corporation, 2022, Not available to the general public, looked at standoff and base-hardening options. Further analysis conducted at PACAF and other USAF organizations looked at standoff and base hardening.

In conversation, when USAF personnel speak of AB, they often refer to the top of the triangle only—the *adaptive* point of the triangle.[6] The more-novel aspects of AB could entail an operating environment with some or all of the following attributes:

- kinetic attacks on airfields
- more locations (i.e., dispersal)
- smaller individual deployments
- shorter duration deployments
- more flexibility and movement (both operations and support).

Thus, USAF (and Air Mobility Command, specifically) could be supporting numerous small locations with fairly lean resources, which could come under attack and could require rapid redeployment and response. Not all forces, locations, or phases of a campaign would necessarily operate this way, but *some* forces, *some* locations, and *some* phases could.

Thus, for AB to be an effective warfighting construct, all three points of the triangle must be considered. Standoff, hardening, and the AB concepts represent three types of mechanisms for confronting the challenges of contested and degraded operations environments. All three will need to be coordinated by commanders. Creatively choosing from among the three and combining them as necessary to fight and win in contested and degraded operations environments, depending on the operational circumstances, is what will constitute the operational art of war.

Evolving Operational Concepts

Before AB became a term of art, numerous competing adaptive or dynamic operational concepts emerged. Different organizations throughout the USAF and joint community have embraced AB and have identified, developed, and begun to experiment with a variety of approaches and concepts, including the following:[7]

- *Flex-basing.* PACAF developed this concept under which threatened forces, given indications and warning, would temporarily escape, or *flex*, to alternate locations to wait out an attack or to fight from those alternate locations.[8]

[6] Personal conversations at Pacific Air Forces (PACAF), U.S. Air Forces in Europe (USAFE), and Air Staff, 2018–2019.

[7] The list is somewhat of a hodgepodge of concepts from abstract to more concrete. We present these concepts here to provide a representation of the range of thinking across USAF on the topic.

[8] This concept is not to be confused with a previous RAND report that used the term *flexbasing* for a strategy of providing a high degree of *operational and logistical flexibility* by developing and maintaining a robust capability to deploy to, and operate from, a range of locations with widely varying characteristics. See Paul Killingsworth, Lionel A. Galway, Eiichi Kamiya, Brian Nichiporuk, Robert S. Tripp, and James C. Wendt, *Flexbasing: Achieving Global Presence for Expeditionary Aerospace Forces*, Santa Monica, Calif.: RAND Corporation, MR-1113-AF, 2000.

- *Dynamic basing.* U.S. Pacific Command developed this concept, which aims to make combat power survivable by keeping the logistics "tail" as close as possible to the combat "teeth." Simply stated, dynamic basing depends on dynamic logistics.[9]
- *Cluster basing.* This RAND-developed concept calls for several resilient bases of equal capability to be located close to one another to share resources and provide mutual support to one another in the event of attack. AB documents use the term more broadly—i.e., "a basing approach that groups bases and operating locations geographically for mission continuity, ease of C2 [command and control], supportability, and mutual protection."[10]
- *Rapid Raptor.* This PACAF concept calls for the quick deployment of a package of F-22 Raptors and supporting logistics to any forward operating base in the world and having the aircraft in combat-ready status within 24 hours of employment. The package would use one C-17 aircraft for carrying materials, munitions, and maintainers and later for moving, refueling, and rearming a minimum of four F-22s in unfamiliar, austere environments, leaving a small footprint.[11]
- *Rapid-X.* Very similar to Rapid Raptor but developed by USAFE, Rapid-X calls for the quick deployment of any type of fighter aircraft (not just F-22s) to assist missions from bases that lack the full infrastructures that usually support fighter units in a major contingency. The concept calls for bringing in four fighter aircraft, rearming and maintaining them, having them fly another mission, and possibly then vacating the assisted base. The intent is to use a wide range of locations in Europe to challenge a potential adversary seeking to target aircraft and disrupt allied operations.[12]
- *Untethered operations.* Closely related to Rapid-X and also originated by USAFE, this concept seeks to leverage robust basing and North Atlantic Treaty Organization (NATO) partner interoperability to complicate Russian targeting and create an arsenal of options for allied combat operations in Europe. Under this concept, a small package of fighters could drop into a base with the support of only the amount of personnel and equipment that could fit on a single C-17, conduct operations for just several hours without bedding down overnight, and depart with the C-17, leaving the base essentially as it was found.[13]

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[9] Harry B. Harris, Jr., "Logistics Officers Association Symposium," speech delivered at the U.S. Pacific Command of the Logistic Officer Association Symposium, National Harbor, Md., October 13, 2016.

[10] U.S. Air Force, *Adaptive Basing Concept of Operations*, Washington, D.C., 2017, Not available to the general public.

[11] Marc V. Schanz, "Rapid Raptor Package," *Air Force Magazine*, September 27, 2013.

[12] Jon Harper, "U.S. Air Force Preparing for 'High Volume' Operations in Europe," *National Defense Magazine*, April 5, 2016.

[13] Charles Q. Brown, Jr., Bradley D. Spacy, and Charles G. Glover III, "Untethered Operations: Rapid Mobility and Forward Basing Are Keys to Airpower's Success in the Antiaccess/Area-Denial Environment," *Air and Space Power Journal*, May–June 2015.

- *Joint forward area refueling point (FARP).* This joint concept is closely related to the U.S. Marine Corps concept of FARP operations. The FARP mission is to provide ordnance and fuel for highly mobile and flexible helicopter and fixed-wing operations. The size of the FARP varies with the mission and the number of aircraft to be serviced. Normally, FARPs are transitory facilities used for a specific duration and mission.[14] The U.S. Marine Corps uses another variant of this concept, called *distributed short take-off vertical landing operations*.[15]
- *Agile combat employment.* This is a PACAF concept that directly informs the command's numbered plan by incorporating a limited number of discrete base types.

Implications of AB for the MAF

The above operational and support concepts would have varying implications for mobility operations; indeed, quantifying those implications and proposing ways to address them are the primary purposes of this research and the focus of the main report.[16] However, there are two broad issues that should be considered (1) the demand for mobility platforms and personnel to support the CAF operating under an AB scheme and (2) the survivability of MAF assets when supporting CAF operations close to the threat.

Demand for MAF Support

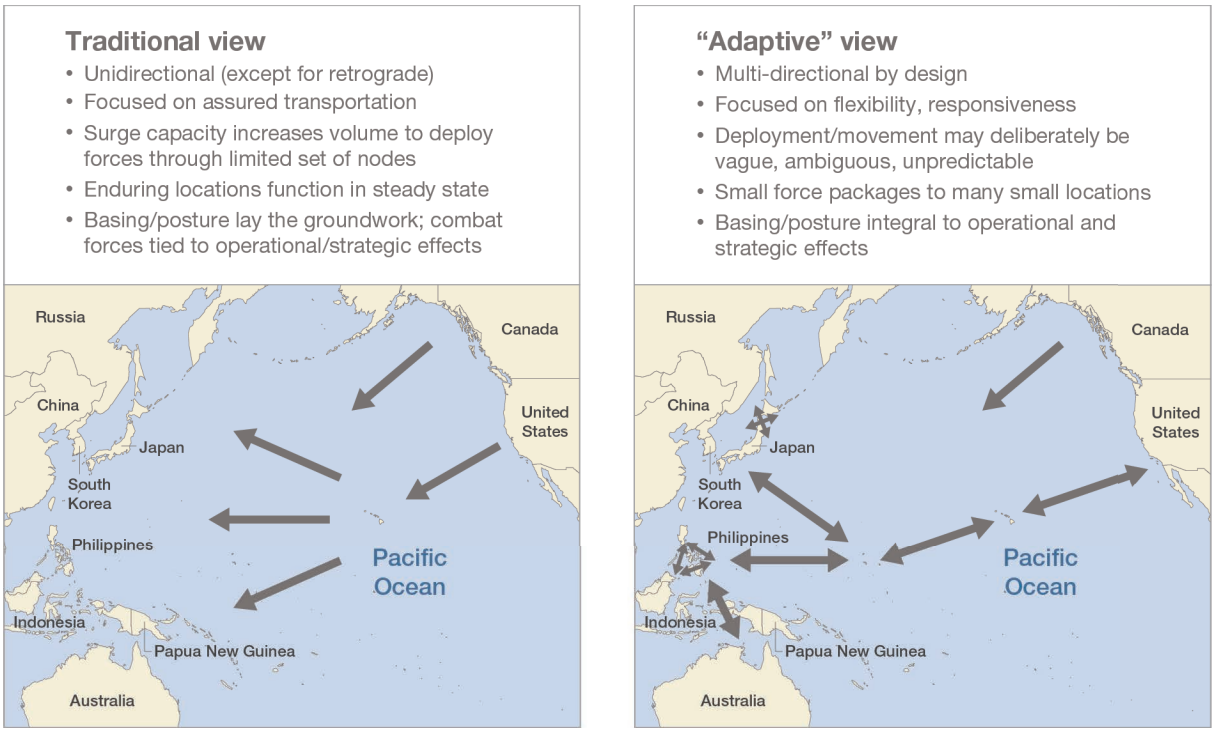
The above AB concepts rely (implicitly or explicitly) on MAF platforms and personnel to accomplish CAF missions. Tanker aircraft are already integrated directly into CAF sorties and missions, and that relationship is often a known quantity. Movement and maneuver could also place new and greater demands on airlift platforms, especially if bases must be scaled up and down throughout the theater, potentially at locations with little to no enduring USAF presence. Figure A.2 summarizes some of the major differences between *traditional* and *adaptive* approaches to meet these requirements.

[14] Marine Corps Warfighting Publication 3-21.2, *Aviation Logistics*, Washington, D.C.: U.S. Marine Corps, October 21, 2002.

[15] System Planning and Analysis, Inc., *Distributed Short Take-Off Vertical Landing (STOVL) Operations: An Initial Look at Concept Development and Feasibility Final Report*, Washington, D.C., February 2014.

[16] Orletsky, Brown, DeBlois, Mills, Norton, Brackup, et al., 2023.

Figure A.2. AB Requires a New Approach



In the traditional view, the force flow is typically unidirectional into the theater. A small amount of personnel and cargo (including medical evacuations) is retrograde back to a main base outside the theater and outside the threat to attack. This concept relies on very large and capable origin, destination, and en route mobility bases that can deliver huge cargo throughputs. This requires the entire mobility system to be operated in the most efficient way possible to maximize the cargo delivered. As a result, mobility bases are typically large nodes that have vast infrastructure built up over many years. These bases are typically operated by U.S. forces at all times at a low level and have the ability to surge during a crisis. This network of bases is typically thought of as a sanctuary immune to any sort of disruption resulting from enemy action. In this model, combat forces are directly tied to operational and strategic objectives, but the network of bases simply lays the groundwork, enabling them to operate.

By contrast, the air mobility system required to support AB is fundamentally different. In the adaptive view, cargo moves throughout the theater in different directions—not all just moving toward forward operating locations. Depending on the objectives, cargo is deployed to forward locations and redeployed to other forward locations or rear bases throughout the conflict. To meet the commander's intent of providing specific effects while using maneuver and other tactics to reduce the risk to the combat air forces, operating within the threat ring will often be required. As a result, air forces need to present an ambiguous and unpredictable face to the adversary. This requires a very flexible and responsive mobility system that can continually adapt to the operational situation and deliver the capability required. AB operations are likely to

require constant movement of small force packages to many locations throughout the theater. In this model, the network of bases and the forces and resources moving in and among them are integrally tied to operational and strategic objectives. In some cases, those objectives may be accomplished merely by the actions of the base network, without any offensive actions taken by combat forces.

MAF Adaptations for Survivability

The second implication of AB for the MAF is that MAF platforms and forces may be put in harm's way to meet the AB mission set, and the MAF may have to adapt its own platforms or CONOPs for greater survivability. In the main report,[17] we explore a range of tactics and concepts to improve survivability for both tankers and airlifters. Those are less often articulated as part of AB concepts, as a major focus in discussions of agile operations is supporting the CAF. But this second demand on the MAF is a key part of supporting AB environment and is key to this analysis.

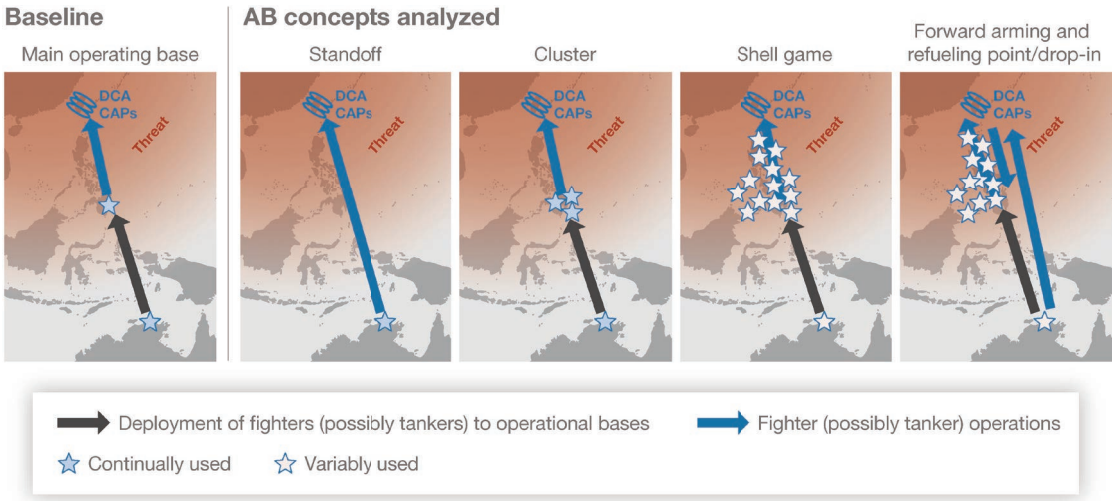
AB Concepts Analyzed

To analyze the impact of AB on the MAF, we examined the various AB concepts discussed above to understand how these concepts could affect the MAF. Drawing from this subjective assessment, we identified a set of four AB concepts (Figure A.3) that could be analyzed from an air mobility perspective. These concepts are described in Chapter 2 of the main report.[18] For each concept (plus the baseline traditional approach), we examined the demand for mobility platforms and personnel in a Pacific vignette, proposed ways to mitigate shortfalls between expected supply and demand, and suggested ways to minimize time that mobility aircraft must spend on the ground exposed to threat. The results are also summarized in the main report.

[17] See Chapters 3 and 4 of Orletsky, Brown, DeBlois, Mills, Norton, Brackup, et al., 2023.

[18] Orletsky, Brown, DeBlois, Mills, Norton, Brackup, et al., 2023.

Figure A.3. Basing Concepts Analyzed



NOTE: CAP = combat air patrol; DCA = defensive counterair.

We analyzed four AB concepts, in addition to the baseline:

- **Main operating base (baseline):** This is the traditional USAF basing approach, similar to many expeditionary bases already in use, such as Bagram Air Base in Afghanistan.
- **Standoff:** This concept calls for a large, highly capable base with a large number of aircraft operating continuously, but the base is located beyond the range of all but intermediate-range ballistic missiles, resulting in very long fighter and tanker sorties.
- **Cluster basing:** This concept calls for multiple bases, each smaller than a main operating base. Nearby bases share resources via ground lines of communication. We analyzed operations using three and six forward-located cluster bases supporting F-35s.
- **Shell game:** This concept is similar to the cluster concept, except that forces move from base to base over the course of the campaign. Not all bases are flying sorties or are necessarily occupied all the time. In this analysis, we assumed a six-base shell game concept, in which one wing of aircraft would operate from any three of the six bases at any time. We evaluated the deployment and employment airlift requirements for different shell game base concepts (e.g., move timelines, initial base operating support [BOS] deployment level to each base, different levels BOS movement between bases). We assumed a wing of F-35s operating from three of the six bases, and one-third of the wing and 50 percent of the BOS must be moved to the new base each day.[19]
- **Forward area refueling point (FARP)/drop-in:** This concept involves two types of base: a main base that acts as the parent to a number of highly mobile FARP/drop-in bases. Each day, forces at the FARP/drop-in bases move to a (potentially different) forward location, support F-35 operations, and then move back to their parent base. For this work, we investigated concepts using two or four FARP/drop-in bases supported by a single main parent base.

[19] Appendixes F and G (Orletsky, Brown, DeBlois, Mills, Norton, Guffey, et al., 2023) show results assuming different levels of BOS movement.

Appendix B. Political Challenges to Adaptive Basing and Military Access

The Politics of Military Access

The main operating base, cluster basing, shell game, and FARP/drop-in concepts considered in this report all require American allies or partners in the Asia-Pacific region to allow American forces varying degrees of access to their facilities. As noted in the main report,[20] demands on the MAF can be significantly reduced if the host country provides additional support, including trucks or roads for ground logistics, security and refueling services, and permission to preposition materials. However, planners cannot take this assumption for granted. Host countries may refuse to allow USAF aircraft use of facilities or airspace. Even if host countries do allow some military access, they may place limits on the number and type of forces allowed to use their territory or forbid certain activities. For context of how an adversary may use power to disrupt U.S. operations, Table B.1 provides a brief assessment of the types of host-nation support that are required for different AB concepts.

Table B.1. Demands for Access and Allied Support for Basing Concepts

Concept	Airspace Access	Airfield/ Airstrip Access	Security, Refueling, and Other Ground Support	Prepositioning	Access to Roads and Ground Logistics
Baseline (main operating base)	Essential	Essential	Helpful	Helpful	Not applicable
Standoff	Helpful	Not applicable	Not applicable	Not applicable	Not applicable
Cluster basing	Essential	Essential	Helpful	Helpful	Helpful
Shell game	Essential	Essential	Helpful	Helpful	Helpful
FARP/drop-in	Essential	Essential	Helpful	Helpful	Helpful

This appendix considers how the Chinese government may seek to limit U.S. access to required bases. First, a recap of previous research is presented to identify factors that affect a country's willingness to allow foreign forces to use its territory or facilities. Next, a discussion of the different types of power (hard, soft, sharp) an adversary might choose to employ in an effort to limit access is presented. We then conduct three case studies using these factors that we have

[20] Orletsky, Brown, DeBlois, Mills, Norton, Brackup, et al., 2023.

identified to evaluate the likelihood that countries in the Asia-Pacific would provide access to U.S. forces in a contingency. Finally, conclusions are drawn from this work.

Unfortunately, the majority of the research done on military access has focused on agreements to provide long-term access during peacetime, and relatively little work has been done on requests for short-term, exceptional military access to respond to a contingency, as would be needed for AB. That being said, we can draw some conclusions from the few studies that have been done on contingency access, as well as general principles observed in the peacetime access literature.

One of the clearest lessons is that the type of operations for which contingency access is sought is very important. Historically, requests for contingency access have usually been granted, but almost half of requests for access to conduct minor combat operations and almost a quarter of requests for access for major combat operations were either restricted or denied.[21] One of the key reasons for the rejections seems to be the host state's fear of economic or military retaliation from the state against which the operations are launched. Another clear lesson is that states that have decided that the presence of American forces on their territory in peacetime is fundamentally good for their national interest (as opposed to needed to defend against a specific foe or desirable because of some quid pro quo concessions provided by the United States) are much more likely to allow contingency access. Finally, operations that have the blessing of a large number of foreign governments and international bodies, especially those that would normally be expected to oppose such operations, are less likely to encounter access denial or limitation by host governments.

Even in countries in which the United States is very popular, American operations are likely to spark public resentment. The nature of the contingency to which the United States is responding may increase the fervor of antiaccess protesters, as happened during the 2003 invasion of Iraq, but it may also make protests much less likely if the host country is perceived to be under attack. Although protests may complicate operations and pressure local leaders, they will likely not prevent military action as long as local elites remain committed to allowing access. Governments that are convinced that providing access to American troops is in their national interest are usually able to compensate, co-opt, or coerce local protesters who are endangered or inconvenienced by American military activities. Protesters' ability to deny the U.S. military access is strongest in states that have recently undergone a major shake-up of decisionmaking elites (such as a regime change or major political transition), states in which legislatures or local governments have a greater say in decisions on military access, or states with which the United States has historically been associated with colonial or dictatorial regimes.

Although many of the factors that affect access decisions involve the host state and the state conducting military operations on the host's territory, there are some things that third states can

[21] Stacie L. Pettyjohn and Jennifer Kavanagh, *Access Granted: Political Challenges to the U.S. Overseas Military Presence, 1945–2014*, Santa Monica, Calif.: RAND Corporation, RR-1339-AF, 2016, pp. 76–77.

do to influence the process. Perhaps the most effective spoiling measure that such states can take is issuing open or implied threats against the host. In the past, the threat of military or economic retaliation has caused even staunch U.S. allies to refuse contingency access, and China's extensive trade with American partners in the Asia-Pacific make this a likely strategy for Beijing if it ever wishes to convince local states to deny American forces the contingency access they would need to implement most AB concepts. China or other nations seeking to influence prospective hosts to deny or limit American military access could also use their influence in international bodies to prevent those bodies from sanctioning military operations, depriving Washington of an important source of legitimacy. Finally, China or other states could use their soft or sharp power to influence elites or the public in target states directly, although it is not clear how effective such a course of action would be.

In this appendix, we will first discuss the reasons behind the widespread popular resistance to providing military access to foreign forces. Next, we will proceed to analyze the factors that make states more or less likely to give in to this pressure and deny either peacetime or contingency access to foreign troops. We will then discuss in greater depth the tools China can use to influence other states in the Asia-Pacific region to refuse or limit military access. Finally, we apply these principles to the cases of the Philippines, South Korea, and Japan to illustrate how they can be used in practice to anticipate and gauge the seriousness of challenges to peacetime or contingency access.

Widespread Pressure to Deny Access

One of the things that the literature on peacetime access makes clear is that there is usually pressure within host countries to deny access. This pressure can be effectively managed by host governments that are committed to their relationship with the United States and the presence of American forces in their country, but it is almost always present. One key source of this pressure is nationalism. Especially in countries that had a colonial relationship with the United States in the past, the presence of American troops always seems to invite nationalistic opposition. Even in countries without such a background, foreign troops are usually seen as an affront to national sovereignty.[22]

Another reason for the widespread opposition to access is the inconveniences and dangers military operations bring to local populations. Although the benefits of military bases (usually improved security) are generally spread across an entire populace, the noise, crime, pollution, and risk of adversary attack that military installations bring are usually disproportionately meted out to those living close to military facilities.[23] This tends to lead to a dynamic in which local

[22] Pettyjohn and Kavanagh, 2016, p. 13; Kent E. Calder, *Embattled Garrisons: Comparative Base Politics and American Globalism*, Princeton, N.J.: Princeton University Press, 2007, p. 84; Yuko Kawato, *Protests Against U.S. Military Base Policy in Asia: Persuasion and its Limits*, Stanford, Calif.: Stanford University Press, 2015, p. 4.

[23] Calder, 2007, pp. 67, 86.

activists protest bases while host country central governments support them.[24] These protests are often not anti-American, and in most countries antibase activity is not very well correlated with anti-Americanism as measured in public opinion polls.[25] Rather, the protests tend to focus on local grievances caused by American military operations or facilities. Although local concerns frequently lead to opposition to peacetime access, is possible that they will be less of a problem for short-term contingency access to civilian facilities. There is no doubt that military operations from these locations will create disproportionate costs for those living nearby and that protest movements can develop quickly, but antibase activism usually takes time before it can affect public policy or impact operations.[26]

As problematic as local interests are, they can usually be effectively managed by a dedicated host government. Even in cases in which public outrage limits the access that officials are willing to give American troops, committed governments can often (though not always) find ways to meet U.S. operational needs while minimizing public discontent.[27] More problematic can be cases in which the national interest of the host state as defined by decisionmaking elites is harmed by American operations. This was a key reason Turkey was so hesitant to allow American troops to use its territory to invade Iraq in 2003—in the past, American operations in Iraq had brought Ankara nothing but a stronger Kurdish movement, refugees, economic trouble, and the threat of retaliatory attacks against its territory.[28] This effect goes the other way as well—when American operations are perceived to directly benefit a host nation, it tends to be quite willing to allow peacetime or contingency access.[29]

Host governments also sometimes deny or threaten to deny access to increase the payouts they receive in exchange. Although the United States officially frowns on providing economic or other aid as a quid pro quo for basing rights, it has often done so, and host governments have often threatened to deny access or even inflamed local anti-American sentiment to put pressure on American negotiators to agree to increase the price they pay.[30] For example, in 1988 the Philippines demanded an increase of hundreds of millions of dollars in American rent payments

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[24] Calder, 2007, pp. 92–93.

[25] Alexander Cooley, *Base Politics: Democratic Change and the U.S. Military Overseas*, Ithaca, N.Y.: Cornell University Press, 2008, pp. 260–261. Note that Turkey may be an exception to this rule.

[26] Kawato, 2015, pp. 23–24. Note that this might not always be the case, especially when legislative approval is needed for short-term contingency access.

[27] For example, while Arab states were hesitant to allow the United States to station troops in their territories to facilitate the escort of civilian shipping through the Strait of Hormuz in the 1980s for fear of public outcry, they managed to meet the U.S. Navy's logistical needs by mooring boats in international waters and using those as a staging ground. See Pettyjohn and Kavanagh, 2016, pp. 111–112.

[28] Pettyjohn and Kavanagh, 2016, p. 88.

[29] Pettyjohn and Kavanagh, 2016, pp. 48–49, 87–88.

[30] Calder, 2007, p. 140; Cooley, 2008, p. 190; H. D. P. Envall, "Underplaying the 'Okinawa Card': How Japan Negotiates Its Alliance with the United States," *Australian Journal of International Affairs*, Vol. 67, No. 4, July 2013, pp. 384–386. Note that Envall finds that that Japan did *not* do this but that other countries do.

for its facilities there, as well as a commitment not to station nuclear weapons on Philippine territory, and in 2006 Kyrgyzstan demanded a hundred-fold increase in American rent payments for the continued use of the Ganci air base soon after American facilities in Uzbekistan were closed.[31] Although such bargaining tends to be more prevalent in peacetime access arrangements, it is not unheard of in agreements for contingency access.[32]

Factors That Determine the Success of Political Opposition to Access

Researchers have also identified several factors that determine the extent to which these forces succeed in limiting or denying peacetime and contingency access. Again, the lion's share of the research is much more focused on peacetime access. One of the only studies to address contingency access directly is Pettyjohn and Kavanagh's *Access Granted*. They found that the type of operation for which the United States requests access is one of the most significant factors determining whether or not states grant access. Noncombat and humanitarian operations were uncontroversial and were rarely opposed.[33] Combat operations since World War II tend to be more problematic, with 15 percent of major combat operations restricted and 8 percent denied, while 12 percent of limited strike operations are restricted and 33 percent are denied.[34] It seems that many nations' fear of allowing the United States to use their territories to launch limited strikes is that it will lead to retaliation, whereas major combat operations tend to eliminate or significantly reduce the target state's ability to retaliate.[35] That being said, overall 90 percent of America's formal requests for contingency access have been granted.[36] Although this number does not include sub-rosa refusals delivered behind closed doors or instances in which Washington decided not to ask because it anticipated a refusal, it does show that, in general, access requests are granted, especially for uncontroversial operations unlikely to lead to retaliation.[37] Pettyjohn and Kavanagh also found that operations that were considered more legitimate were less likely to face access challenges. Legitimacy is of course difficult to measure, but they found that approval from international organizations (such as the United Nations and Arab League) or other states, especially those who would normally be expected to oppose the operation in question, can play a helpful though not decisive role in mitigating access challenges.[38]

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[31] Cooley, 2008, pp. 80–81; Calder, 2007, pp. 54–55.

[32] Calder, 2007, pp. 145–146.

[33] Pettyjohn and Kavanagh, 2016, pp. 75–77.

[34] Pettyjohn and Kavanagh, 2016, pp. 76–77.

[35] Pettyjohn and Kavanagh, 2016, pp. 76–77.

[36] Pettyjohn and Kavanagh, 2016, pp. 72–75.

[37] Pettyjohn and Kavanagh, 2016, pp. 72–75.

[38] Pettyjohn and Kavanagh, 2016, pp. 104–106.

Much of the research on the politics of military access has focused on peacetime access, but these studies did identify principles that could be useful in determining when challenges to contingency access are likely to be successful. In his study of the overseas bases of the United Nations Security Council's five permanent members, Kent Calder found that the historic relations between the basing state and the host state are significant. In cases in which the host was a former colony of the basing state, peacetime access was almost always eventually denied.[39] In cases in which the host state was liberated by the basing state (i.e., the basing state toppled an unpopular government with which it was not associated), basing relationships tended to be much more stable.[40] Some have cast doubt on this assertion by observing widespread resistance to bases in some states that Calder considers to have been liberated by the United States, but the bases remain, despite the protests.[41] Calder and others have also noted that any association of the United States with a past autocratic leader makes challenges to access more likely, and prodemocracy networks can easily be turned from opposing a dictator to opposing the American military that seemed supportive.[42] Although Calder's work focuses mostly on peacetime access, it is possible that a similar logic could apply to contingency access.

Catalyzing incidents also seem to pose significant problems for access. These are major accidents or crimes caused by the American military or its personnel that then cause widespread public backlash. Such incidents, if properly handled by antiaccess activists, could lead people who otherwise would be unlikely to actively oppose bases to join in protests and can continue to generate antibase sentiment for decades.[43] Although these events are rare and therefore unlikely to happen at the same time as a contingency, if one does occur, it would likely lead to significantly greater pressure to limit or deny access. Furthermore, past catalyzing incidents in a host country would likely continue to act as a rallying cry to call the otherwise ambivalent to oppose access agreements with the United States.

One of the most important determinants of whether access is granted, limited, or denied is the nature of the host state. In states where power is more decentralized and local governments are more independent, they will often use this independence to oppose both peacetime and

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[39] Calder does note that there are some rare exceptions to this rule, including some of France's former African colonies with which Paris continues to enjoy a special relationship, British bases in Brunei and Cypress where "special British political understandings" were a part of independence arrangements, and America's base at Guantanamo Bay in Cuba. See Calder, 2007, pp. 226–227.

[40] Calder, 2007, pp. 226–227.

[41] Amy Austin Holmes, *Social Unrest and American Military Bases in Turkey and Germany Since 1945*, New York: Cambridge University Press, 2014, pp. 190–191.

[42] Calder, 2007, pp. 107–108; Glenn D. Hook and Key-yong Son, "A Tale of Two 'Alliances:' Internal Threats and Networked Civil Society in Japan-U.S. and South Korea-U.S. Base Politics," *Pacific Focus*, Vol. 28, No. 1, April 2013, p. 31.

[43] Pettyjohn and Kavanagh, 2016, pp. 17–18; Calder, 2007, pp. 86–87; Cooley, 2008, pp. 111, 151.

contingency access against the will of the central government.[44] Decentralization of decisionmaking authority at the national level is especially problematic for access relationships, and countries that require legislative approval for access agreements are more likely to limit or deny peacetime access—and possibly contingency access as well.[45] As for regime type, most scholars agree that well-developed democracies are the most stable peacetime partners, although there is some disagreement as to whether authoritarian states or newly democratizing states make more-stable partners in the short term.[46] In the long term, most scholars agree that access arrangements with dictators are inherently unstable, because when the dictator is toppled, the next government tends to question the legitimacy of the access agreement and move to limit or deny access.[47] Even though regime type can have a major impact on peacetime access, it seems that its impact on contingency access is far more limited. Pettyjohn and Kavanagh found that it was not one of the significant factors associated with the granting or denial of contingency access requests.[48] Regime change has been found to be highly correlated with peacetime challenges as well, but it is a relatively rare occurrence and therefore unlikely to happen in a state from which the United States requests access to handle a contingency in a third state.[49]

In their examination of challenges to peacetime and contingency access, Pettyjohn and Kavanagh found that the reason why a state accepts an access agreement is a key factor in the stability of that agreement. States that agree to allow American troops into their territories because of economic or military payments are relatively likely to limit or threaten to limit access to pressure American leaders into paying a higher price for access.[50] Interestingly, the research showed that countries that allowed the stationing of U.S. troops in their territories in peacetime for transactional reasons were actually more likely than states in which the United States did not have troops stationed to deny contingency access.[51] Nations that are motivated by the protection American troops provide against a common threat tend to have stable peacetime access

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[44] Calder, 2007, p. 226; Hook and Son, 2013, pp. 28–30, 38. Note that Calder and Hook and Son disagree on whether Japan or South Korea has the more decentralized system, but they agree that greater autonomy of local governments tends to empower antiaccess movements.

[45] Pettyjohn and Kavanagh, 2016, p. 111. Given the lack of work on contingency access, there is admittedly less conclusive evidence that such arrangements limit contingency access. That being said, it is a major factor in peacetime access, and, at least for Turkey in 2003, it was a major factor in contingency access as well. Further research to verify this relationship could include examining instances in which national legislatures issued resolutions condemning American actions while their governments allowed access.

[46] Cooley, 2008, pp. 23, 252; Pettyjohn and Kavanagh, 2016, pp. 41–44.

[47] Pettyjohn and Kavanagh, 2016, pp. 41–44; Calder, 2007, pp. 107–108.

[48] Pettyjohn and Kavanagh, 2016, pp. 69–83.

[49] Calder, 2007, p. 228. Although a contingency may involve the collapse of the government in whose territory operations are targeted, the primary question here is whether neighboring states will allow the American military to use their territories or airspaces.

[50] Pettyjohn and Kavanagh, 2016, pp. 47–48.

[51] Pettyjohn and Kavanagh, 2016, pp. 81–82.

relationships as long as the threat remains but are not much more likely to allow contingency access than states in which the United States has no bases.[52] States that are motivated by an *enduring partnership*, on the other hand, are significantly more likely to allow unrestricted access in a contingency. These are nations that have had a long peacetime U.S. military presence and have decided that the presence of American troops in their territories is fundamentally good for regional stability and for their national interests.[53]

Nationalism and local grievances galvanized by catalyzing incidents or historic legacies can all cause major antiaccess demonstrations, but if the host government's decision-making elite has formed a high level of consensus that the presence of American troops is important for their national security, they are usually able to manage opposition to reduce or eliminate the effect it has on American operations.[54] Committed governments can take proactive action to disrupt anti-access activists' efforts to frame an issue as a struggle for justice, and can compensate those on whom the burdens of hosting soldiers fall most heavily.[55] Sometimes public outcry results in some limitations on operations, but it does not usually prevent contingency operations in and of itself.

The Adversary's Tool Kit: Hard, Soft, and Sharp Power

How an Adversary Could Politically Challenge AB in the Pacific Theater

The influence of third-party nations on military access relationships remains a relatively understudied topic, and many of the factors that affect military access have little to do with the actions of third-party states. Even so, China has at least explicitly recognized that America's reliance on allied governments for military access constitutes a key weakness that could be attacked diplomatically.[56] Existing research does show some ways in which third parties have sought to interfere with military access and suggests some ways in which they might do so in the future.

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[52] Pettyjohn and Kavanagh, 2016, pp. 81–82.

[53] Pettyjohn and Kavanagh, 2016, pp. 49–50, 81–82.

[54] Kawato, 2015, pp. 23–24; Andrew Yeo, *Activists, Alliances, and Anti-U.S. Base Protests*, New York: Cambridge University Press, 2011, p. 8.

[55] Yeo, 2011, p. 8; Claudia J. Kim, "War over Framing: Base Politics in South Korea," *Pacific Review*, Vol. 30, No. 3, 2017, pp. 311–313; Calder, 2007, pp. 133–136.

[56] Roger Cliff, Mark Burles, Michael S. Chase, Derek Eaton, and Kevin L. Pollpeter, *Entering the Dragon's Lair: Chinese Antiaccess Strategies and Their Implications for the United States*, Santa Monica, Calif.: RAND Corporation, MG-524-AF, 2007, pp. 77–79.

Scholars have identified three broad categories of tools that states use to get the outcomes they want from other states.[57] These are hard, soft, and sharp power. Hard power includes the traditional tools of statecraft that can impose costs or create benefits, such as military force, threats, economic sanctions, and economic aid.[58] Soft power, on the other hand, refers to tools of persuasion or attraction that can be used to convince the public or leaders of a target state to share your objectives.[59] The sources of soft power include an attractive culture, attractive political values, and policies that are seen as legitimate and unselfish.[60] For example, if friend A wants to convince friend B to take up running, friend A can threaten to hit friend B if they do not run (military hard power), offer to pay them for running (economic hard power), or try to convince them that running is good for their health (soft power). Sharp power is similar to soft power in that it focuses largely on the beliefs and thinking of decisionmakers and the public but different in that it tends to emphasize manipulation and distraction more than attraction or persuasion.[61] It focuses as much on silencing critical voices as promoting a country. Activities associated with sharp power include the covert use of civil society organizations to intimidate actors in a target state, the purchase of news outlets to control their reporting, and pressure (often in conjunction with economic hard power) on civil society actors to self-censor.[62] To return to the analogy above, if hard power involves friend A threatening or paying friend B to run and soft power involves persuasion, sharp power could involve friend A hacking friend B's computer to ensure that they saw only advertisements for running, never biking or swimming.

Economic and Military Hard Power

Ultimately, China's most-potent tools are its military and, especially, economic hard power, which enable it to impose massive costs on states in the region or provide them substantial

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[57] See especially the works of Joseph Nye, as well as those of Christopher Walker and Jessica Ludwig on sharp power. Joseph S. Nye Jr., *Soft Power*, New York: Public Affairs, 2004; Joseph S. Nye Jr., "Get Smart: Combining Hard and Soft Power," *Foreign Affairs*, Vol. 88, No. 4, July–August 2009; Joseph S. Nye Jr., "How Sharp Power Threatens Soft Power: The Right and Wrong Ways to Respond to Authoritarian Influence," *Foreign Affairs*, January 24, 2018; Christopher Walker, "What Is 'Sharp Power'?" *Journal of Democracy*, Vol. 29, No. 3, July 2018; Christopher Walker and Jessica Ludwig, "The Meaning of Sharp Power: How Authoritarian States Project Influence," *Foreign Affairs*, November 16, 2017. See also Benjamin E. Goldsmith and Yusaku Horiuchi, "In Search of Soft Power: Does Foreign Public Opinion Matter for U.S. Foreign Policy?" *World Politics*, Vol. 64, No. 3, July 2012; Ernest J. Wilson III, "Hard Power, Soft Power, Smart Power," *Annals of the American Academy of Political and Social Science*, Vol. 616, No. 1, March 2008.

[58] There is admittedly some disagreement over whether or not economic carrots or sticks constitute soft or hard power. See the following section, "Economic and Military Hard Power," for further discussion of this point.

[59] For a differentiation between hard and soft power, see Nye, 2004, pp. 5–7; Wilson, 2008, p. 114.

[60] Nye, 2004, pp. 5–6.

[61] Walker and Ludwig, 2017; Walker, 2018; Working Group on Chinese Influence Activities in the United States, *Chinese Influence and American Interests*, Stanford, Calif.: Hoover Institution Press, 2018.

[62] Walker and Ludwig, 2017, Walker, 2018; Working Group on Chinese Influence Activities in the United States, 2018.

infrastructure aid packages that no other country can give them. These massive economic carrots and sticks will likely make it difficult for the United States to persuade local elites to allow the United States to make extensive use of their civilian facilities unless their country is directly involved in the conflict for which the United States has requested access or they are an enduring partner.

Threats of military action against a host state are a tried and true way to coerce host states into limiting military access. As in all alliances, America's allies in the Pacific fear being entrapped in a war they do not want to defend their ally's interest (in this case, the United States).[63] The threat of retaliation was a key factor in Japan's demand that the United States remove U2 spy planes from its territory in 1960, as well as the refusal of many NATO members to allow access for American strikes on Libya in 1986, and it helped drive public protests against NATO's deployment of missiles in Europe during the Euromissile crisis.[64] Pettyjohn and Kavanagh identified fears of military or economic retribution as a possible primary reason why limited strike operations generate more challenges to contingency access than any other type of operation, including invasions or major combat operations.[65] There is clear evidence that China's People's Liberation Army (PLA) has contemplated the use of such threats to coerce American allies into denying access.[66] Still, threats of military retaliation are far from a guaranteed success. At least in Japan, there is some evidence that the public in general (even on pacifist Okinawa) tends to become more supportive of the Japan-U.S. alliance when events nearby make them feel threatened.[67] Whether military threats cause the public to agitate against access, as happened during the Euromissile crisis, or to show greater support for an alliance with the United States, as happened in Japan during the North Korean nuclear crisis, may depend on whether or not the United States is seen as an aggressor. This could be one area in which soft or sharp power becomes significant.[68]

Economic hard power is especially important in the Pacific theater, where China's economic dominance has made local states extremely reluctant to cross Beijing. As seen in the Philippines, the promise of Chinese investment can be a potent tool to convince other states to adopt policies

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[63] Glenn H. Snyder, *Alliance Politics*, Ithaca, N.Y.: Cornell University Press, 1997, pp. 185–186.

[64] Pettyjohn and Kavanagh, 2016, pp. 23–24, 77, 108–109; Holmes, 2014, pp. 191–192.

[65] Pettyjohn and Kavanagh, 2016, pp. 23–26, 76–77.

[66] Cliff et al., 2007, p. 79. Note that diplomatic work does tend to get less attention in PLA writings than kinetic attacks on American shipping and other targets. Cliff et al. are unsure whether this means that it is less emphasized or whether its lack of prevalence was because most of the writings they studied were military-related works and thus inherently more likely to focus on operational issues.

[67] Koji Kagotani and Yuki Yanai, "External Threats, U.S. Bases, and Prudent Voters in Okinawa," *International Relations of the Asia-Pacific*, Vol. 14, No. 1, January 2014, p. 109; Envall, 2013, pp. 393–396.

[68] Holmes, 2014, p. 191.

preferred by China.[69] By withdrawing its trade, tourists, or investment, China can cause billions of dollars of damage to any country that displeases it in the region. In 2017, China used sanctions to try to compel the South Korean government to restrict access to American Terminal High Altitude Air Defense (THAAD) missile defense systems, ultimately costing the South Korean economy about $15 billion. The sanctions resulted in South Korean promises to limit further THAAD deployment, although it is unclear whether the South Korean Moon Jae-in administration had any interest in further deployment to begin with.[70] In both the Philippines and South Korea, China was influencing peacetime access, but these incidents demonstrate the magnitude of China's economic power to punish or reward American allies in the region, and at least in South Korea, these economic measures were a response to the addition of new American weapon systems in the region. PLA thinkers seem to be confident that the importance of good relations with China would be sufficient to prevent most regional states from becoming deeply involved in a Taiwan contingency.[71] Historically, the threat of economic retaliation has led allies to deny military access, as occurred during the American airlift of supplies to Israel during the 1973 Yom Kippur War.[72]

Finally, any infrastructure projects owned or operated by Chinese companies may pose operational security challenges for USAF units operating nearby. Chinese engineers and workers allegedly installed backdoors into servers that Beijing provided for the African Union headquarters in Addis Ababa, and it is possible that either physical listening devices or digital weaknesses could be placed in communications and other infrastructure that China produces for states in the Asia-Pacific.[73] Although many Chinese projects are no doubt innocent, Chinese construction or management of communications and other infrastructure could create new opportunities for espionage.

Economic hard power has a somewhat confused relationship with soft power. Soft power is predicated on persuasion or attraction, but as David Baldwin has noted, an employer offering high wages can easily attract many employees, and increasing a bid is an excellent way to persuade someone to sell you a car.[74] China's aid helped convince Philippine elites to deemphasize their territorial claims in the South China Sea and has helped increase Chinese soft

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[69] Timothy McLaughlin, "A U.S. Ally is Turning to China to 'Build, Build, Build,'" *The Atlantic*, May 8, 2019; "Has Duterte's China Pivot Backfired?" *Asia Times*, April 17, 2019.

[70] David Josef Volodzko, "China Wins Its War Against South Korea's U.S. THAAD Missile Shield—Without Firing a Shot," *South China Morning Post*, November 18, 2017.

[71] Cliff et al., 2007, pp. 78–79.

[72] Kavanagh and Pettyjohn, 2016, pp. 25–26.

[73] John Aglionby, "African Union Accuses China of Hacking Headquarters," *Financial Times*, January 29, 2019.

[74] David A. Baldwin, *Power and International Relations: A Conceptual Approach*, Princeton, N.J.: Princeton University Press, 2016, pp. 166–167.

power throughout Southeast Asia.[75] Economic power has also helped Beijing spread its censorship and sharp power abroad, requiring academics and film producers to toe the party line on major issues if they wish to visit or do business in China and threatening the interests of businesses already in China to make them into a reliably pro-China constituency within their own governments.[76] Some authors push for a broader definition of *soft power* to also incorporate the direct economic power that comes with interdependence.[77] Although it is difficult in the Philippines and similar cases to determine how much of Beijing's influence comes from an attraction to China as opposed to an attraction to Chinese money, it should be noted that economic hard power and soft power do not always go hand in hand. Vietnam is one of the countries most hostile to China despite large Chinese investment, and in 2018 Malaysians elected Mahathir Mohamad as prime minister on an anti-China platform, pledging to scrutinize Chinese investment projects and ensure that they serve Malaysian interests.[78] In both Malaysia and Vietnam, there is evidently both a pecuniary desire for Chinese trade and investment and an unease toward China itself. Using economic power coercively can also lead to a soft power backlash: After China's sanctions in 2017, the percentage of South Koreans with negative views of China almost doubled.[79] It can thus be useful to differentiate between economic hard power and soft power.

Soft Power

Since the 1980s, China has engaged in a prolonged "charm offensive," successfully selling itself as a peaceful power whose benign rise was nothing to fear. Through the early 2010s, Beijing's diplomatic initiatives, economic dynamism, and support for peaceful solutions to problems resulted in increasingly favorable views around the world, particularly in Africa, Latin America, and Southeast Asia.[80] China's more-recent actions, however, have cost it in terms of soft power. Since 2015, China's approval ratings have remained at around 50 percent in the Philippines, dropped from 63 to 53 percent in Indonesia, and dropped from around 61 percent to 48 percent in South Korea. In Australia, China's approval ratings increased from 57 to 64

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[75] Richard Wike, Bruce Stokes, Jacob Poushter, Laura Silver, Janell Fetterolf, and Kat Devlin, *Trump's International Ratings Remain Low, Especially Among Key Allies*, Washington, D.C.: Pew Research Center, 2018, p. 54.

[76] David Shambaugh, "China's Soft-Power Push: The Search for Respect," *Foreign Affairs*, Vol. 94, No. 4, July–August 2015, p. 104; Working Group on Chinese Influence Activities in the United States, 2018, p. 176.

[77] See, for example, Andrei P. Tsygankov, "If Not by Tanks Then by Banks? The Role of Soft Power in Putin's Foreign Policy," *Europe-Asia Studies*, Vol. 58, No. 7, p. 1081.

[78] Panos Mourdoukoutas, "Malaysia Is Standing Up to China," *Forbes*, July 19, 2019; Pew Research Center, Global Indicators Database, undated.

[79] Pew Research Center, undated.

[80] Gregory G. Holyk, "Paper Tiger? Chinese Soft Power in East Asia," *Political Science Quarterly*, Vol. 126, No. 2, Summer 2011, pp. 225, 229, 231–232.

percent from 2015 to 2017, before falling to 48 percent in 2018, largely because of public outrage over China's sharp power activities.[81] There is less data available for Malaysia, but the election of Prime Minister Mohamad indicates that Malaysians are also increasingly uneasy about China's rise. Despite these setbacks, in 2018, more than half of survey respondents in the Philippines and Indonesia and almost half in Australia had "favorable" or "very favorable" views of China.[82]

Although popularity among the public is only one measure of soft power, it is an essential one because public pressure on elites to change policy is one of the key ways in which soft power can change states' behavior.[83] More-nuanced measurements of soft power, which take such factors as diplomatic presence, culture, human capital, and economic attraction into account, also tend to find that China trails the United States and Japan by a significant margin globally, and even falls short in Southeast Asia, though the gap is much smaller there.[84] China's traditional culture and scientific progress have helped make it more attractive; however, its continued violations of human rights, censorship of its own pop culture industry, and closed domestic market continue to hold it back in terms of soft power.[85] Perhaps even more damaging is China's state-led, propaganda-heavy approach to generating soft power. In general, soft power is most effectively generated by civil society and groups or individuals independent of the government who build an attractive culture and society.[86] China, on the other hand, often seeks to sway public and elite opinion with government-led media and propaganda. Although some have argued that China's state-driven model of soft power may actually make it more attractive to authoritarian regimes in Southeast Asia and elsewhere, China's aggressive pursuit of territorial claims in Southeast Asia and long history of animosity toward the governing elites of many Southeast Asian states tends to counteract this effect.[87] Finally, the nature of the conflict for which the United States is seeking contingency access (especially whether or not China is seen

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[81] Pew Research Center, undated.

[82] Pew Research Center, undated.

[83] Nye, 2004, 18; Goldsmith and Horiuchi, 2012, pp. 558, 576.

[84] Holyk, 2011, pp. 231–232; Soft Power 30, homepage, undated.

[85] Soft Power 30, undated (see especially the page on China for 2018).

[86] Nye, 2004, pp. 106–108; Shambaugh, 2015, pp. 99–102.

[87] Shambaugh, 2015, pp. 101–102; Natasha Hamilton-Hart, *Hard Interests, Soft Illusions: Southeast Asia and American Power*, Ithaca, N.Y.: Cornell University Press, 2012, pp. 196–198. Note that Hamilton-Hart argues that these states' view that the United States is benign and China is threatening is based on their long history of seeking American protection and aid against communist insurrections and invasions—and that if the states' relationship with America should ever run contrary to the interests of the ruling elite, they may abandon Washington for Beijing. For her, it is as much a matter of individual and class interest as one of soft power, persuasion, or attraction. That being said, she also found that most decisionmakers or advisers in many Southeast Asian states (especially the most-authoritarian ones) believed that their country's modern history had taught them to fear China, making it easy for them to see Beijing as an enemy and difficult to see it as a friend.

as an aggressor and which countries are involved) may significantly affect the views of local populations and elites in unpredictable ways.

It is not entirely clear how soft power affects policy, and this has long been one of the key criticisms of the concept.[88] There is some evidence that a relatively pro-American public can pressure their leaders to adopt more pro-American policies, or at least refrain from pressuring them not to adopt such policies, and Pettyjohn and Kavanagh found that operations seen as legitimate were less likely to face political access challenges.[89] Still, even in states where the public is very pro-American and anti-Chinese, AB concepts are likely to give rise to resistance and protest from local residents. In Japan, where a large majority supports the U.S. alliance, most changes to military deployments are met with protests of some kind from local residents and officials.[90] Even in the United States, local activists or governments sometimes oppose new military activities or deployments.[91] That being said, South Korea's ability to expand Camp Humphreys shows that a committed host government can effectively rally support and make changes to the deployment of American forces within its territory despite both local antibase and national anti-American protests.[92] Chinese soft power may increase the size of these protests and the cost they impose on local governments, and conversely American soft power may help decrease these costs, but host-government officials will likely have to overcome some level of local resistance or resentment either way, and the costs imposed by protesters may pale in comparison to the massive economic costs and military risk that China is likely to impose with its hard power.[93] At the elite level, convincing decisionmakers to shoulder these heavy burdens may be marginally easier if they have been to the United States or are attracted by American culture and values, especially values that the United States may be protecting in a particular intervention. Still, there is no guarantee that this will be the case, and American soft power has in the past failed to convince allies to endure economic retaliation to allow contingency access, as seen during the Yom Kippur War.[94]

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[88] Goldsmith and Horiuchi, 2012, p. 558; Baldwin, 2016, pp. 164–165.

[89] Goldsmith and Horiuchi, 2012, p. 105; Pettyjohn and Kavanagh, 2016, pp. 89–90. Note that although anti-American or anti-Iraq war sentiment might have contributed to some states taking a harder line on the war, with the exception of Turkey, contingency access to American facilities in country was not politicized.

[90] See the Japan case study, later in this appendix.

[91] Keith Ridler, "Air Force Disputes Lawsuit to Stop Urban Training in Idaho," *Air Force Times*, June 8, 2019; Erin Brown, "Burlington City Council Votes to Oppose 'Nuclear-Capable Aircraft' in Burlington," WCAX 3, August 13, 2009.

[92] See the South Korea case study, later in this appendix.

[93] Nye, 2009, p. 160. Nye notes that although soft power will often fail to change policy alone, it can reduce the hard power costs of bringing about change.

[94] Pettyjohn and Kavanagh, 2016, pp. 25–26.

Sharp Power

Sharp power is a more recent term coined to describe the ways in which China and similar authoritarian states seek to covertly influence public or elite opinion and to extend censorship into open and democratic societies. Walker and Ludwig have observed, "Authoritarian influence efforts are 'sharp' in the sense that they pierce, penetrate, or perforate the political and information environments of the target countries," seeking to "monopolize ideas, suppress alternate narratives, and exploit partner institutions."[95] Unlike soft power efforts, which focus mostly on persuasion and attraction and are usually generated predominantly in the private sector, sharp power tends to be government led and is "the deceptive use of information for hostile purposes."[96] Activities associated with sharp power include the use of civil society groups, such as academic institutes, student groups, or business associations, to surveil, intimidate, and silence voices in a target state. These groups are often secretly funded and directed by state actors.[97] Expanding state-led media conglomerates and purchasing independent broadcasters to control the media environment, especially media in the authoritarian state's language, is also a hallmark of sharp power.[98] In addition to influencing public opinion, Beijing has also used civil society groups, private individuals, and business associations under its control or guidance to seek to more directly influence politicians or the political process, particularly in Australia and New Zealand.[99]

As with soft power, it is unclear how exactly sharp power could bring about political challenges to access. The fact that Chinese officials will likely be coordinating and funding public protests against access could make them larger and better targeted to bring maximum pressure on decisionmakers.[100] The Chinese Communist Party (CCP) will also likely hold the business interests of local companies hostage to make them into a pro-China constituency within the target country, pressuring elites to deny access.[101] Chinese agents or intermediaries may also try to more directly influence politics or politicians, as has happened in Australia and New

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[95] Walker and Ludwig, 2017.

[96] Nye, 2018.

[97] Office of the Secretary of Defense, *Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2019*, Washington, D.C.: U.S. Department of Defense, May 2, 2019.

[98] Walker and Ludwig, 2017; Alexander Bowe, *China's Overseas United Front Work: Background and Implications for the United States*, Washington D.C.: U.S.-China Economic and Security Review Commission, August 24, 2018, pp. 3, 17.

[99] Bowe, 2018, pp. 16–18. In New Zealand, CCP influence is especially strong in some local elections, and in 2017, Australian Senator Sam Dastyari, who had often taken pro-Chinese stances in the Australian legislature, stepped down after details were revealed of his financial and personal relationship with Huang Xiangmo, a local Chinese businessperson associated with the Chinese government. In New Zealand, it was revealed that a member of parliament, Yang Jian, had undisclosed ties to Chinese military intelligence after he was elected.

[100] Bowe, 2018, pp. 10–11.

[101] Working Group on Chinese Influence Activities in the United States, 2018, pp. 175–176; Russell Hsiao, "A Preliminary Survey of CCP Influence Operations in Singapore," *China Brief*, Vol. 19, No. 13, 2019.

Zealand, where CCP operatives and intermediaries have sought to influence local elections, bribe national politicians, and even get candidates with PLA affiliations elected to national office.[102] Still, the CCP's sharp power efforts have also led to significant backlashes in some cases, especially in Australia. In South Korea, the mere suggestion that protesters were supported by North Korea was enough to cause much of the population to turn against them.[103]

China recognizes the importance of access to bases and airspace near a conflict area for USAF. For all but a standoff basing concept (which was one of the most difficult to implement, requiring a very large number of aerial refueling tankers to generate even relatively small combat packages over the crisis zone), local bases are essential. More-proactive local support, including help moving USAF personnel and materiel between small forward bases, provision of refueling and security services, and access to prepositioned supplies, can substantially reduce the burden on the MAF.[104] Although it is unclear how effective Beijing's soft and sharp power will be in coming years, it has already employed economic hard power to reduce the willingness of local states to cooperate with the U.S. military—and will likely do so again.[105]

Case Studies

In the preceding sections, we discussed the factors that made countries more or less likely to provide military access to U.S. forces, as well as the things adversaries could do to influence them to deny access. Next, we will apply these principles to help determine how likely key allies are to allow the United States to implement AB strategies on their territories and to see how these factors play out in practice. For these case studies, we have chosen the Philippines (featured in the example cases in the main report[106]), South Korea, and Japan. One of the key factors in the selection of these three countries was the fact that their long and politically turbulent history of hosting American forces has ensured that there is ample information available about their relationship with the American military. They are also three of America's most important allies in the region and are likely key locations from which the United States might seek to operate using AB concepts.

It should be noted that these case studies represent only a preliminary examination of the issue in these three countries. Further research, likely including interviews with local stakeholders and decisionmakers, would be needed to determine under what conditions these countries may be willing to allow AB in their territories with greater certainty. Our tentative findings are that Japan is most likely to provide contingency access for AB, followed by South

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[102] Bowe, 2018, pp. 16–17.

[103] Pew Research Center, undated; Kim, 2017, p. 316.

[104] Orletsky, Brown, DeBlois, Mills, Norton, Brackup, et al., 2023.

[105] Volodzko, 2017.

[106] Orletsky, Brown, DeBlois, Mills, Norton, Brackup, et al., 2023.

Korea and then the Philippines, although the nature of any contingency for which AB is sought will have a significant impact on the willingness of any of these countries to play host.

The Philippines

Historical Background

The Philippines has had a long, conflicted relationship with the United States. First colonized by Spain in the 1500s, the Philippines came under American control in 1898 after the Spanish-American War. This was followed by a long and bloody war against the American occupation and an anti-American insurgency that lasted longer still. Throughout the 1920s and 1930s, the islands were gradually granted greater autonomy, but plans to grant them formal independence were interrupted by the Japanese invasion in 1941. Throughout World War II, American and Philippine soldiers and guerrillas fought side by side to expel and defeat the Empire of Japan.[107]

In 1946, the Philippines was finally granted formal independence, but Washington imposed a "neo-imperialist" military access agreement on the islands in 1947. This included a 99-year lease on the land American military bases were built on, broad extraterritoriality for American forces on duty and even Filipinos working on U.S. bases, and essentially no restrictions on the use of the bases, which were explicitly meant for U.S. power projection.[108] The United States did not provide any security guarantees for the Philippines until the 1950s.[109] In 1959, a more equitable treaty was reached, ceding some land to the Philippines and restricting the United States' ability to station missiles on Philippine territory.[110]

The next major challenge to American military access in the Philippines came in 1986, with the ouster of the Philippine dictator Ferdinand Marcos. Marcos had seized power in 1972, and throughout his 14-year autocratic rule his government was closely associated with the United States.[111] When he was overthrown by a popular uprising in 1986, many in the new government were former anti-Marcos activists opposed to the American presence.[112] Significantly, the new Philippine constitution stipulated that the approval of two-thirds of the Senate of the Philippines would be needed for any new military access agreement.[113] The 1966 lease on the land used for the American bases expired in 1991, and American negotiators worked furiously to secure an extension. Despite opposition from many old anti-Marcos activists, Manila was willing to allow

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[107] Gregario C. Borlaza, Michael Cullinane, Carolina G. Hernandez, and the editors of Encyclopedia Britannica, "Philippines," *Encyclopedia Britannica*, June 28, 2019.

[108] Cooley, 2008, pp. 65–66.

[109] Cooley, 2008, pp. 67–68.

[110] Cooley, 2008, pp. 68–69. Note that the United States also began to pay rent on the land on which the bases were built, and a *mutual defense board* was built to handle complaints by Filipinos.

[111] Cooley, 2008, pp. 70–73.

[112] Cooley, 2008, pp. 73, 80; Kawato, 2015, pp. 151–159.

[113] Cooley, 2008, pp. 73, 80; Kawato, 2015, pp. 151–159.

the Americans to stay provided that they dramatically increased the rent they paid for the bases. The Philippine and American governments were able to reach an agreement to extend the lease in 1991, but it failed to gain the two-thirds support it needed in the Senate of the Philippines for final approval. In 1992, American forces were withdrawn from the Philippines, leaving behind some of the largest foreign U.S. bases in the world.[114] The creation of anti-Marcos activist networks, which could also serve to spread antiaccess activism and especially the requirement that two-thirds of the Senate approve any new access agreement would plague the Philippine-U.S. military relationship for decades and continues to complicate access agreements today.

American troops would not return to the Philippines in significant numbers until 2000, when some American soldiers returned to the islands on rotation to participate in the Philippine Balikatan exercises and other exercises. These activities served both to help modernize the Philippine armed forces and to help them defeat continued communist and Islamist insurgencies. The presence of these foreign troops was authorized under the Philippine 1991 Visiting Forces Agreement (which had Senate approval).[115] In 2002, American special forces teams worked with Philippine units to conduct counterinsurgency operations in Basilan Province. This operation was labeled an exercise, and it both removed insurgents and helped build civic projects on the island. It was a resounding success, leading other localities to call for similar cooperative operations in their areas.[116] A much larger-scale operation was planned for Sulu province, but when the Pentagon announced that 1,700 American troops would be involved and that some of them would engage in combat, there was a major public backlash and the operation was canceled.[117] In 2014, amid rising Sino-Philippine tension over overlapping territorial claims in the South China Sea, the Philippines and United States signed the Enhanced Defense Cooperation Agreement, which allowed the United States to manage some facilities at Philippine bases. Five such bases were designated in 2016, one of which is near the disputed Spratly Islands. The law allows visiting troops, vessels, and aircraft to use these U.S.-managed facilities and for the American military to store equipment there. These facilities are explicitly not American bases, and the Philippines maintains full access to and sovereignty over them.[118]

American and Filipino soldiers would again work together on Mindanao when, in May 2017, Islamic State–affiliated militants occupied the city of Marawi, sparking a months-long operation to retake the city. American advisers were on the ground with Filipino forces, and U.S.

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[114] Cooley, 2008, p. 80.

[115] Cooley, 2008, p. 87.

[116] Sheila A. Smith, *Shifting Terrain: The Domestic Politics of the U.S. Military Presence in Asia*, Honolulu: East-West Center, March 2006, p. 38.

[117] Smith, 2006, p. 38.

[118] Leonard Postrado, "EDCA Prevails," *Manila Bulletin*, January 13, 2016; Jose Katigbak, "US, Philippines Agree on 5 Base Locations Under EDCA," *Philippine Star*, March 19, 2016.

surveillance and strike aircraft helped defeat the insurgents.[119] In April 2019, the annual Balikatan exercise included 4,000 Americans, 3,500 Filipinos, and 50 Australians practicing counterterror operations, urban combat, and large-scale amphibious operations (possibly in response to China's moves in the South China Sea, although all official sources denied this).[120] At present, even though there is no official peacetime American presence on the Philippines, U.S. participation in past counterinsurgency operations (especially the Marawi operations) shows that at least small deployments of support personnel in response to crises are possible. The Enhanced Defense Cooperation Agreement and large Balikatan exercises hint at the possibility of larger deployments to support the Philippine military in a South China Sea crisis, although major AB operations may yet be hampered by the need for Senate approval and Manila's hesitancy to cross Beijing.

Outlook for Future Access

The Philippines has been described as a "repeat offender" in terms of limiting, denying, or renegotiating access agreements.[121] That being said, there is reason to believe that the current level of peacetime access will be maintained. The Visiting Forces Agreement was reached by a legitimately elected Philippine government and is therefore less likely to be challenged as illegitimate. The Enhanced Defense Cooperation Agreement did suffer a legal challenge by lawmakers who felt that it should have required Senate approval, but in 2016 the Supreme Court of the Philippines upheld the law as an executive agreement justified under the Visiting Forces Agreement and Mutual Defense Treaty between the Philippines and the United States.[122] This has helped to depoliticize the issue of military access and moved to put it under the control of bureaucrats rather than politicians. The Visiting Forces Agreement has already weathered two catalyzing incidents—one case of alleged rape in 2005 and the murder of a transgender Filipina in 2014. These led to some protests but no major changes to the agreement or U.S. presence.[123]

There is a core of nationalist and leftist activists in the Philippines who agitate against the presence of U.S. forces there, but overall the population is among the most pro-American in the world (in 2018, 83 percent had positive views of the United States) and generally supports the presence of U.S. troops within the country.[124] In 2017, 75 percent said they approved of having

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[119] Shawn Snow, "Philippine Commando Video Shows Marawi in Ruins After Liberation from ISIS," *Military Times*, December 4, 2017.

[120] Kyle Rempfer, "U.S., Filipino, and Aussie Forces Conduct Premier Military Exercise, but Don't Mention China," *Military Times*, April 11, 2019.

[121] Pettyjohn and Kavanagh, 2016, pp. 137–140.

[122] Postrado, 2016.

[123] Cooley, 2008, pp. 88–89; Lindsey Bever, "U.S. Marine Convicted of Killing Transgender Filipina," *Washington Post*, December 1, 2015.

[124] Wike et al., 2018, p. 18; Jacob Poushter and Caldwell Bishop, "People in the Philippines Still Favor U.S. over China, but Gap Is Narrowing," Pew Research Center, September 21, 2017.

the U.S. military in their country, while only 20 percent had a negative view.[125] As noted above, although anti-American sentiment often fails to lead to major challenges to access, widespread pro-American sentiment could make it difficult for antiaccess activists to gain enough support to bring sufficient pressure to bear on political leaders to change access policy. However, at present there is little firm data to determine whether pro-American sentiment is correlated with less or less successful antiaccess agitation.[126]

Although the United States does enjoy a significant soft power advantage over China in the Philippines, in 2018, 53 percent of Filipinos had a favorable view of China, and 43 percent held unfavorable views.[127] China's economic hard power and promise of investment both seem to have played a significant part in its popularity: Between 2015 and 2017, the number of Filipinos who felt that their country should prioritize economic relations with China over aggressively pursuing their territorial claims went from 40 percent of the population to 67 percent.[128] Still, more-recent Chinese aggression in the South China Sea seems to have cost China in the court of public opinion. In 2019, the swarming of Philippine-occupied Thitu Island by Chinese fishing boats and the sinking of a Philippine boat after a collision with a Chinese fishing vessel caused widespread anger and protests.[129] Also contributing to the disillusionment of the Philippine public was the fact that only a small portion of the aid China promised the Philippines after Rodrigo Duterte became president had been disbursed by 2019.[130]

Although the public tends to be broadly pro-American, there seems to be a lack of consensus among Philippine decisionmaking elites on the value of American troops in the country. In particular, Duterte has publicly expressed interest in strategic alignment away from the United States and toward Beijing and Moscow.[131] Again, this seems to be driven at least in part by China's economic hard power, with Duterte hoping that improved relations with Beijing could

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[125] Wike et al., 2018, p. 18; Poushter and Bishop, 2017.

[126] Cooley, 2008, pp. 260–261; Kawato, 2015, pp. 5–6. Note that according to Claudia J. Kim, the existence of conservative media outlets and a pro-American segment of the public made it difficult for antiaccess activists to build the public consensus needed to change access policy. That being said, there is not yet any hard, statistical evidence that higher levels of pro-American views are correlated with fewer or less successful challenges to access, and the supposition that it might make access more secure is speculative (Kim, 2017).

[127] Pew Research Center, undated.

[128] Poushter and Bishop, 2017.

[129] Richard Heydarian, "Duterte Heads to Beijing on Tide of Philippine Dissent over 'Meek and Humble' South China Sea Policy," *South China Morning Post*, August 18, 2019.

[130] Raissa Robles, "When Xi Meets Duterte: Is the China-Philippines Honeymoon Over?" *South China Morning Post*, August 13, 2019.

[131] Anders Corr, "China's Threat of War Against Philippines Is Baseless Scare Tactic," *Forbes*, May 20, 2017; Pia Lee-Brago, "U.S. to Remain Philippines' Only Military Ally," *Philippine Star*, April 8, 2019; Ben Westcott and Brad Lendon, "Duterte Threatens 'Suicide Mission' If Beijing Oversteps in South China Sea," CNN, April 5, 2019.

bring Chinese investment.[132] Opposition from the top could be the greatest obstacle at this time to both contingency and peacetime access in the Philippines, but it should be noted that for all of Duterte's talk of realignment, several factors make such a change difficult. One is widespread public support for the U.S.-Philippine alliance. Another is the ongoing territorial dispute between China and the Philippines. As Pettyjohn and Kavanagh have explained, relationships motivated by mutual defense against a common enemy tend to be stable as long as the enemy remains threatening, and it seems that China's aggressive moves in the South China Sea have moderated Duterte's opposition to the United States.[133]

Although peacetime access at current levels seems relatively stable, contingency access could be more difficult. As demonstrated by the canceled Sulu province operation and Philippine care to avoid designating American trainers assisting in the 2017 siege of Marawi as combat troops despite their proximity to the fighting, any major combat operations would likely face staunch opposition and a high level of scrutiny. That being said, the Supreme Court's broad interpretation of the Visiting Forces Agreement could help ameliorate the problem, especially for noncombat operations. At least limited American use of Philippine facilities can now evidently be granted without Senate approval under the Enhanced Cooperation Agreement, and the agreement has allowed the U.S. military to preposition some supplies, an essential first step in many AB strategies. Any access given under the Visiting Forces Agreement is likely to be limited, but the fact that it would not necessarily need Senate approval makes it far more likely that it would be granted in a timely manner, especially for less controversial noncombat operations.

Another possible obstacle to contingency access could be the mutual defense nature of the U.S.-Philippine relationship. In general, states that allow access to secure themselves against an adversary of the basing power resist the use of their territory or facilities on their territory for purposes other than their own defense.[134] Statements from Duterte and Secretary of National Defense Delfin Lorenzana to the effect that they do not wish to be drawn into a Sino-American conflict suggest that they would indeed be reluctant to allow contingency access if the contingency did not directly involve Philippine security or territory.[135] Beijing could increase Manila's reluctance by explicitly threatening retaliation if American forces use Philippine territory.[136] That being said, in the event that a contingency does directly involve the Philippines, it is far more likely that approval would be forthcoming. Although Duterte has carefully cultivated closer ties with Beijing, he has also made it clear that he does not intend to allow

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[132] Karen Lema and Martin Petty, "Two Years After Philippines' Pivot, Duterte Still Waiting on China Dividend," Reuters, November 18, 2018.

[133] Corr, 2017; Lee-Brago, 2019; Westcott and Lendon, 2019; Pettyjohn and Kavanagh, 2016, pp. 48–49.

[134] Pettyjohn and Kavanagh, 2016, pp. 48–49.

[135] McLaughlin, 2019; Jason Gutierrez, "Philippine Official, Fearing War with China, Seeks Review of U.S. Treaty," *New York Times*, March 5, 2019.

[136] Pettyjohn and Kavanagh, 2016, pp. 77, 86.

China to encroach on occupied Philippine territory, and defense of that territory would likely require the granting of military access to American combat forces.[137]

China's economic hard power in the Philippines could also be an issue for contingency access. During the 1973 Yom Kippur War, the economic dependence of America's Western European allies on Middle Eastern oil and threats of an Arab oil embargo were significant factors in the decision of most mainland European countries to deny access for the American airlift of supplies to Israel.[138] At present, China is the Philippines' largest trading partner. Duterte has also actively sought Chinese funding for his "build, build, build" economic program, and Beijing has promised $24 billion in investment.[139] Although these promised funds have (from a Philippine perspective) been frustratingly slow in coming, there are not yet any apparent alternative sources of funding for the level of infrastructure construction that Duterte envisions.[140] By cutting off this funding or reducing trade, China has the capacity to impose substantial costs on the Philippines, which might make it difficult for Washington to convince Manila to allow contingency access, especially in a contingency that would not directly affect the Philippines.

South Korea

Historical Background

As the Empire of Japan collapsed following the end of World War II, both the Soviet Union and the United States rushed to accept the surrender of Japanese military units in northeast Asia. The two nations hastily agreed that the Soviets would accept the surrender of Japanese units and be responsible for maintaining order in Korea north of the 38th parallel, while the Americans would do so south of the parallel.[141] This division led to the largely unintended emergence of separate, bitterly antagonistic governments on either side of the parallel.[142] Both governments aspired to unite the entire peninsula under their own leadership, setting the stage for North Korea's 1950 invasion of the south.

Following a blitzkrieg invasion in June 1950, North Korean forces quickly routed their South Korean opponents, and the southern government was saved only by the timely intervention of the United States and other allied nations.[143] During the war, Korean and allied forces fought under U.S. command, and at its conclusion, Washington forced South Korean President Syngman Rhee to accept a peace settlement dividing the peninsula (Rhee hoped to continue the war and conquer

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[137] Westcott and Lendon, 2019.

[138] Pettyjohn and Kavanagh, 2016, pp. 107–108.

[139] McLaughlin, 2019.

[140] McLaughlin, 2019; "Has Duterte's China Pivot Backfired?" 2019.

[141] Sheila Miyoshi Jaeger, *Brothers at War*, New York: W. W. Norton and Company, 2013, pp. 18–19.

[142] Jaeger, 2013, pp. 31, 44–45, 51.

[143] Jaeger, 2013, pp. 68–73; Calder, 2007, pp. 107–108.

the north). In exchange, the United States provided Rhee with a mutual defense treaty and massive military and economic aid.[144] Since the 1953 armistice ended most large-scale fighting on the peninsula (though low-level fighting would continue, occasionally involving hundreds of troops), the United States has maintained a strong military presence to protect the south, and many American soldiers died defending South Korea from North Korean aggression throughout the Cold War.[145] Seoul agreed to place its military under American command, and to provide the United States almost unrestricted military access to its territory and airspace. The American military soon had more than 100 facilities scattered across the country, and American military personnel enjoyed "near extraterritoriality" in Korea.[146]

Rhee was the first in a long line of anticommunist South Korean military dictators supported by Washington. Even though the United States was often horrified by their violations of human rights, it continued to provide the economic and military support that the state and its leading generals needed to remain viable.[147] For their part, South Korean dictators provided the U.S. military with broad peacetime and contingency access. During the Vietnam War, South Korea not only allowed the United States to use bases in Korea as logistics hubs for operations throughout the Asia-Pacific but also sent tens of thousands of troops to help with combat operations in South Vietnam.[148] Even so, while successive South Korean governments supported American military ventures in East Asia, Seoul always reacted with alarm to any suggestion that the United States would move American troops off the peninsula to deal with contingencies elsewhere. In addition to demanding that Washington pay for any Korean troops in Vietnam and increase aid for South Korea, President Park Chung-hee demanded that Johnson guarantee that no further American troops would be withdrawn from Korea as a condition for the provision of South Korean soldiers to fight in the Vietnam War.[149] President Richard Nixon's decision in the 1970s to withdraw 20,000 personnel from Korea was condemned by a unanimous resolution of the Korean National Assembly just one week after it was announced, and President Jimmy Carter's attempts to withdraw an additional 10,000 troops was stymied by resistance from the South Korean government and American military.[150] Although Seoul was happy to provide what

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[144] Jaeger, 2013, pp. 188–200, 278–286.

[145] Daniel P. Bolger, "Scenes from an Unfinished War: Low-Intensity Conflict in Korea, 1966–1969," Leavenworth Papers, U.S. Army Command and General Staff College, No. 19, July 1991.

[146] Cooley, 2008, pp. 98–99.

[147] Cooley, 2008, pp. 106–107.

[148] Cooley, 2008, p. 108.

[149] Gary R. Hess, "With Friends Like These: Waging War and Seeking 'More Flags,'" in David L. Anderson and John Ernst, eds., *The War That Never Ends: New Perspectives on the Vietnam War*, Lexington: University Press of Kentucky, 2007, p. 69.

[150] Cooley, 2008, p. 109.

help it could to contain communism throughout Asia, it fought to keep the American forces stationed on its territory in place.

America's fraught relationship with South Korean strongmen was on full display during the Kwangju incident of 1980, an event that haunts Korean-U.S. relations to this day. In 1980, soon after Chun Doo-hwan seized power, students in Kwangju took to the streets to protest his coup. The protests grew in size until Chun sent in troops to forcibly put them down, killing at least 240 protestors in the process.[151] Although American commanders on the peninsula did not authorize the massacre, they did authorize the movement of some military units into Kwangju (others were sent in without American permission) that later participated in the slaughter, and Chun's invitation to visit Washington just months after the incident seemed to show that the United States supported him despite his actions.[152] This "catalyzing incident" acted as a rallying cry for opposition to the U.S. military presence for decades and is still used by anti-American activists today.[153] It would likely be used by antiaccess activists to rally opposition to any attempt by the United States to secure contingency access in South Korea.

In the late 1980s and early 1990s, South Korea's prodemocracy movement finally succeeded in ending decades of military rule. Kim Yong-sam won the country's first modern democratic election in 1992, and in 1997 the country's first opposition candidate was elected, Kim Dae-jung.[154] Many of the activists who propelled him to power had been criminalized by South Korea's draconian national security laws when they were young protesters against Korea's authoritarian military governments. This prevented them from finding less political roles in society, and they formed a semipermanent activist core, many of whom saw North Korea as a potential friend rather than a potential threat, and that saw the American presence on the peninsula as a relic of the dictatorial past standing in the way of reconciliation with Pyongyang.[155] This view of North Korea was embodied in President Kim's "Sunshine Policy," which aimed to encourage North Korean reform through engagement and inducement rather than confrontation and isolation. Still, among the general population, support for the American military presence remained strong even during the height of Kim's attempts at reconciliation

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[151] Cooley, 2008, pp. 111–112.

[152] Cooley, 2008, pp. 108–112.

[153] Choi He-suk, "Moon Accuses Gwangju Uprising Deniers of Undermining Foundations of Korea," *Korea Herald*, February 18, 2019.

[154] Cooley, 2008, p. 119.

[155] Cooley, 2008, p. 120; Calder, 2007, p. 151. Note that, although in general antiaccess activism is not well correlated with anti-American sentiment, South Korea may be an exception to this rule, possibly because of the existence of a more consistent national anti-American protest movement. That being said, the strength of this movement should not be overstated: The majority of the population has consistently supported American peacetime military access on the peninsula. Even those accused of anti-Americanism are often not in favor of precipitous troop withdrawals. See Hook and Son, 2013, p. 31.

with the north, with more than 70 percent of Koreans in 2000 agreeing that it was necessary to maintain the U.S. troop presence to deter a North Korean invasion.[156]

Antiaccess and anti-American sentiment reached a crescendo in the early 2000s. In 2002, an American armored vehicle on a training exercise ran over and killed two schoolgirls along Highway 56.[157] Within minutes, the girls' mangled bodies had been photographed, and those photos had been shared with thousands via a series of online message boards, email lists, and websites dedicated to publicizing problems caused by American military personnel and installations. Protesters were further enraged when the crew of the vehicle was acquitted by an American military tribunal.[158] That August, 100,000 people protested in Seoul, and the incident helped Roh Moo-hyun carry the South Korean presidential election later that year on a promise to get tough with the Americans.[159] This incident both highlighted the speed with which any catalyzing incident can be exploited by South Korea's dedicated core of antiaccess activists (which could be very damaging should such an incident occur during a crisis) and provided yet another rallying cry for these activists to call on to oppose future contingency access.

Protestors made use of this wave of anti-American feeling to demand the closure of the U.S. bombing range at Kooni, off the west coast of South Korea.[160] Villagers in the nearby town of Maehyangri had been demanding that the range be closed since 1988, claiming that the frequent explosions damaged their homes, that the constant noise caused higher rates of suicide and miscarriage, and that at least 13 residents had been killed by dud bombs.[161] In 1994, Seoul awarded the residents some compensation for damage to their homes, but the range remained in place.[162] In 2000, an American aircraft suffering engine trouble dropped its bombs outside the range, injuring six residents and leading to the formation of the Pan National Solution Committee for the Closure of the U.S. Firing Range in Maehyangri.[163] Antiaccess activists flocked to the village from around the country, and although the villagers were grateful for the support, they did occasionally clash with protesters from outside the area who wanted to make the struggle to close the Kooni range part of a broader struggle against American military access—the villagers were mostly interested in the resolution of their parochial grievances.[164] Eventually, legal challenges launched by the villagers, local protests, and public anger over the Highway 56 incident combined to put enough pressure on Seoul and Washington to close the

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[156] Cooley, 2008, p. 120.

[157] Cooley, 2008, p. 125.

[158] Cooley, 2008, pp. 125–126.

[159] Cooley, 2008, pp. 125–126.

[160] Kim, 2017, p. 319.

[161] Kim, 2017, p. 318.

[162] Kim, 2017, p. 318.

[163] Kim, 2017, p. 319.

[164] Kim, 2017, p. 319.

range, and on April 2004, it was announced that the bombing would be discontinued in 2005.[165] Ultimately, the Kooni range closure was significant because it was one of the few times in which Seoul gave in to the demands of antiaccess activists. Many factors contributed to this success, including the fact that nearby residents had been suffering and agitating against the range for decades, and the issue was generally framed even by relatively pro-American media as a legal struggle by local residents, not as a national movement against the South Korea–U.S. alliance.[166]

The Highway 56 incident and subsequent acquittal of the American soldiers involved led to widespread pressure for a further revision of the U.S.-South Korea Status of Forces Agreement (SOFA).[167] The SOFA had already been revised in 2001, bringing it in line with the provisions in NATO SOFAs that gave much greater authority and jurisdiction to the host country. South Korean activists, however, wanted more, demanding limitations to American jurisdiction over on-duty troops.[168] Roh pushed for greater SOFA reform, but the United States refused to negotiate away its right to jurisdiction over on-duty personnel, fearing that this would allow other nations undue power over its own military operations.[169] Rather than risk a serious rift in the alliance, Roh chose to accept a mere implementation agreement, stating that both sides would more rigorously implement the provisions of the 2001 SOFA.[170] Even a liberal government that had ridden a tide of anti-American sentiment to victory balked at the prospect of losing the security that American forces provided.

To reduce the impact of American forces on the Korean public and increase their ability to rapidly reach hot spots outside the Korean peninsula, in 2002 Seoul and Washington agreed to the Land Partnership Plan to consolidate American military installations in Korea. The Roh administration renegotiated the agreement in 2004, and in the final deal Washington agreed to reduce the number of major bases in country from 43 to 17, freeing up 158 million square meters of land for development. Perhaps most significantly, the United States agreed to vacate its controversial post at Yongsan in the heart of Seoul, shifting Yongsan's facilities south to Camp Humphreys.[171] Even though this would lead to an overall reduction in the land needed for American bases, it required a substantial expansion of Camp Humphreys, necessitating the relocation of 1,372 villagers living nearby. Most of these were elderly farmers.[172] By 2005, the South Korean government had bought all the nearby land that it could, but some residents

[165] Kim, 2017, p. 321. It had also recently been revealed that the U.S. military had dumped formaldehyde into the Han River, further increasing pressure.

[166] Kim, 2017, pp. 315–318.

[167] Kawato, 2015, pp. 112–113.

[168] Kawato, 2015, pp. 112–113; Cooley, 2008, pp. 114–115.

[169] Kawato, 2015, pp. 114–116.

[170] Kawato, 2015, pp. 116–117.

[171] Hook and Son, 2013, p. 32.

[172] Hook and Son, 2013, p. 34.

refused to leave. They were joined by a large group of protesters from outside the area who staged demonstrations emphasizing the pastoral lives of the old farmers and the need to protect their traditional lifestyle from American militarism.[173] In March of that year, violent clashes between protesters and police resulted in 200 injuries.[174] Tens of thousands of demonstrators continued to arrive to impede construction work, but, by 2007, the government had succeeded in convincing the remaining villagers to leave and had discredited the nonlocal protesters by claiming that they cared more about damaging the U.S.-Korean alliance (which remained widely popular) than about the actual grievances of the people being displaced.[175] Construction of Camp Humphreys is ongoing, and as of mid-2019 the base was almost completed.[176]

The construction of Camp Humphreys demonstrates Seoul's continued commitment to providing the U.S. military with peacetime access despite local resistance; however, contingency access has been more problematic. Starting in 2004, the United States pressured South Korea to explicitly agree to the U.S. "strategic flexibility" approach, which would enable it to use its forces in South Korea to flexibly respond to military crises throughout the region instead of remaining in place to defend the south.[177] Seoul was hesitant to accept such a change in policy. Not only did Washington want South Korea to recognize its right to pull its forces away from the peninsula quickly, but it also wanted to reduce overall troop levels in Korea, and to move those troops further away from the North Korean border so that they could be rapidly redeployed elsewhere in Asia. As with previous proposed troop withdrawals, South Korea feared that such changes could weaken the ability of U.S. forces to deter North Korean aggression.[178] Any future AB operations that make use of American assets meant to deter Pyongyang for any other purposes may again stoke these fears. Many in Seoul also worried that if the United States were to use its bases and forces in their country to respond to a contingency elsewhere (particularly Taiwan), South Korea could get drawn into a war with China or other regional power.[179] Even so, the South Korean government recognized that Washington was committed to this new strategy and feared that refusal could seriously jeopardize the alliance and result in far more drastic troop withdrawals. As with the SOFA negotiations of the early 2000s, the South Korean government balked at the prospect of a serious rift in the alliance, and in 2006, the government

[173] Kim, 2017, p. 315.

[174] Kim, 2017, p. 315.

[175] Kim, 2017, pp. 316–317, 35–38.

[176] Kim Gamel, "New Commander Takes Charge at Army's New Home on Korean Peninsula," *Stars and Stripes*, June 27, 2019.

[177] Hyon Joo Yoo, "The Korea-U.S. Alliance as a Source of Creeping Tension: A Korean Perspective," *Asian Perspective*, Vol. 36, No. 2, April–June 2012, p. 339.

[178] Yoo, 2012, p. 338.

[179] Yoo, 2012, p. 338.

agreed, with the caveat that it would not get involved in a war that was not supported by its own populace.[180]

Outlook for Future Access

There are several factors that threaten peacetime access in South Korea. Washington's long history of supporting dictators has created a core of committed antiaccess activists who are able to use sympathetic online media platforms to rapidly capitalize on any potential catalyzing incident. These activist networks are able to rapidly bring significant pressure to deny access. They could be especially problematic in cases in which contingency access is needed because of activists' ability to quickly organize large protests, enabling them to oppose access even in sudden or rapidly developing contingencies. That being said, for all of the activists' connections with the political left in Seoul and influence over the national agenda, they still represent a definite minority both in elite circles and in the public at large. These "migratory" protesters can greatly increase the clout of locals who are harmed by American operations, but they often lack the staying power of those who must actually live in the shadow of American installations, and their intervention can conversely serve to discredit protests with the wider public, which is generally proalliance and proaccess.[181] Although it is difficult to determine the level of their effectiveness at preventing access for AB, in peacetime at least they have generally failed to fully deny access, with the exception of the Kooni range.

The domestic political structure of South Korea helps ensure that those in charge of access agreements are less likely to cater to any radical minority. In Seoul, foreign policy and military access for other countries are mostly controlled by the president, with less input from the legislature. The president is one of the politicians most directly connected to national defense and security issues. Korean presidents cannot be reelected, but on the alliance with the United States, they have tended to try to appeal to the moderate views held by the majority of the population. This concern with the needs of national defense and with the median voter have helped to moderate the views of even those who are elected on a more anti-American platform.[182] Although scholars agree that more decentralized central-local relations tend to empower local elites to oppose host governments and access agreements, there is disagreement

[180] Yoo, 2012, pp. 338–339.

[181] Kim, 2017, pp. 316–317; Hook and Son, 2013, p. 38. Note that although the public tends to hope that the American troops remain in South Korea, there have been brief periods in which a majority or large segment wishes for a gradual reduction in the number of American troops in the country or the closure of a specific facility.

[182] Kim Dae-jung, Roh Moo-hyun, and Moon Jae-in all won as left-leaning candidates opposed to Korea's past military dictators and committed to viewing North Korea as a friend more than a threat. Roh was propelled into office on a wave of anti-American sentiment following the Highway 56 incident and promised to stand up to Washington. Although they did sometimes oppose particular policies or military installations, none of them seriously opposed the existence of American forces in South Korea.

as to whether South Korea should be characterized as a more centralized or decentralized state in terms of central-local government relations.[183]

Many scholars predict that new regimes will contest the basing arrangements of their predecessors, especially if the predecessor was authoritarian and most of all if the new regime is a nascent democracy.[184] Even though antiaccess agitation did not reach its crescendo until ten years after South Korea's first democratic election, it occurred only five years after its first opposition president was elected, and so opposition was not entirely unexpected. Writing in 2008, Cooley predicted that over time, as the South Korean democratic and political party systems matured, major parties would abandon antiaccess stances to appeal to mainstream voters.[185] Overall, this prediction has been vindicated, and at present both political parties in South Korea are broadly supportive of providing peacetime access for American forces in South Korea.[186] Elite consensus in favor of access generally seems to have weathered the storm of the early 2000s, and even liberal Korean governments have tended to proactively and effectively marginalize calls for the removal of U.S. forces from the peninsula, as happened during the Camp Humphreys protests.

Contingency access, however, could prove more challenging. Thus far, both the elite and the public consensus on the need for a continued U.S. troop presence are based largely on the continued North Korean threat. Despite periods of engagement with North Korea that have reduced this threat perception and sometimes strained the alliance, public and elite opinion still generally seem wary enough of Pyongyang to want at least some American forces in country, and North Korea's continued bellicosity and intransigence have thus far interrupted any attempts to build a more stable peace on the peninsula.[187] Seoul has consistently proven its willingness to sacrifice for the security American forces provide, and the South Korean government both marginalized protesters to ensure the completion of Camp Humphreys and committed thousands

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[183] Calder, 2007, p. 226, claims that South Korea is more decentralized, while Hook and Son, 2013, p. 36, argues that it is more centralized.

[184] See, for example Cooley, 2008; Calder, 2007; and Kawato, 2015.

[185] Cooley, 2008, pp. 252–253.

[186] Bu Aeri, <추미애 평화협정 체결해도 주한미군 주둔해야> ["Chu Mi-ae, 'Even If a Treaty Is Signed, U.S. Forces Must Remain in Korea'"], *Asian Economy*, May 2, 2018; Jeong Seok-Hwan, <한국둥, 美에 송개서한 'PVID원칙 견지해달라'> ["Liberty Korea Party Sends an Open Letter to the U.S. Requesting They Persevere with PVID"], *Economics Daily*, May 17, 2018. Note that South Korean liberals in general tend to be more willing to call for limits to access, although most mainstream liberal politicians are against full access denial.

[187] Cooley, 2007, p. 120; Yoo, 2012, pp. 335–336. Note that despite President Moon's active attempts to court North Korea and willingness to see a reduction in joint exercises between South Korean and American forces to placate Pyongyang, his party supports the continued presence of U.S. forces in South Korea, regardless of the outcome of negotiations. It should also be noted that, as of July 2019, North Korea has again begun to test missiles and may soon begin testing nuclear weapons, which will likely lead to more South Korean citizens and elites to view it as a threat. See Bu, 2018.

of troops to the American occupation of Iraq.[188] But what would happen if American requests for contingency access threatened the very security for which Seoul has sacrificed so much by threatening to drag South Korea into a war with China?

South Korea explicitly approved of America's intention to use its troops there flexibly throughout the region—but only with great reluctance and only because the government feared that failure to agree to some future contingency access could jeopardize America's willingness to station those troops in South Korea in peacetime.[189] There is fear among Korean elites and the Korean public that allowing the United States to use its facilities and forces on the peninsula to respond to contingencies could draw South Korea into a war it does not want. These groups have stated their intention to avoid this if at all possible.[190] Although it is possible that Seoul would allow the United States to use existing bases to support contingency response, it would probably try to take steps to distance itself as much as possible from any conflict in which it does not want to be involved (i.e., any conflict with China that does not directly involve South Korea). This would likely make South Korea hesitant to acquiesce to requests for access to civilian or South Korean air force airfields in a conflict with China, particularly because any facility used would likely be subjected to Chinese bombardment. It could also lead Seoul to put pressure on Washington not to use its facilities in South Korea at all, despite South Korea's earlier acquiescence to "strategic flexibility." Furthermore, any lack of consensus among elites could create an opening for Korea's perennial antiaccess activists to more significantly influence policy.[191]

One test of Seoul's willingness to cross Beijing came with the 2017 deployment of the THAAD system on South Korean territory. China objected vociferously, claiming that THAAD's long-range radar would allow the United States to spy on Chinese territory. Before the THAAD incident, China enjoyed significant soft power in South Korea, with a 61 percent approval rating in 2015, but this was not enough to prevent Seoul from deploying the system.[192] Demanding that South Korea remove THAAD, China began using its economic hard power to pressure Seoul, banning official tour groups, encouraging boycotts of South Korean products, and halting Lotte's expansion plans in China (Lotte is the Korean company that owns the land on which THAAD is deployed). These measures cost the South Korean economy more than $15 billion.[193] But they also cost China heavily in the court of popular opinion, and Beijing's approval rating slipped to 34 percent in 2017.[194] In November 2017, South Korean President

[188] Yoo, 2012, p. 338.

[189] Yoo, 2012, pp. 338–339.

[190] Yoo, 2012, p. 338.

[191] Kawato, 2015, pp. 20–21.

[192] Pew Research Center, undated.

[193] Volodzko, 2017.

[194] Pew Research Center, undated.

Moon cleared up the impasse by agreeing not to deploy any additional THAAD batteries, not to join an integrated missile defense shield with Japan and the United States, and not to join a triangular alliance with Japan and the United States.[195]

When it came to South Korea's own defense policy, public protests, Chinese soft power, economic hard power, and military threats were not enough to force South Korea to prevent the deployment of an American weapon system it considered important to its security. Moon had been somewhat critical of the system as a candidate, but, once elected, he found that it was necessary. That being said, his lack of enthusiasm for THAAD suggests that, for him, forgoing the deployment of additional units might have been no great sacrifice.[196] Furthermore, South Korea had already chosen not to become a part of the U.S.-Japanese joint missile shield, and Korean-Japanese tensions make any move toward a formal alliance between the two unlikely.[197] South Korea clearly has a variety of reasons to avoid a closer relationship with Japan; however, it is interesting to note that even though it was willing to sacrifice billions of dollars to protect its own security, it was not willing to engage in regional blocs that could antagonize China.

Seoul greatly values the peacetime presence of American forces on its territory and is willing to sacrifice to keep them in place. The immediate threat of North Korean attack and possibility of creeping Chinese encroachment creates a high level of dependence on the United States and fear of abandonment.[198] That being said, Seoul is also clearly reluctant to cross Beijing on issues not directly related to its own security. Although South Korea would probably honor its agreement to allow the United States to use its existing facilities in the country to respond to regional conflicts that did not involve the Korean peninsula, it is likely to try to contain its own involvement in any such conflicts. This could involve attempts to limit the participation of South Korean military units in any conflict or its refusal to allow the United States access to facilities other than the bases it currently operates. American soft power may help convince the South Korean public and decisionmakers in Seoul to allow greater access, especially if the conflict is one that threatens shared Korean and American values, but it is unclear how strong this effect would be. Past experience suggests that South Korea may be more likely to allow access to more facilities if it fears that failure to do so would jeopardize the continued presence of American forces in the country, although the public would likely respond poorly to overt threats. It is also possible that Seoul would allow broader access in a conflict involving China if it became clear that limiting American military access would not limit China's economic and military retaliation against South Korea.

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[195] Volodzko, 2017.

[196] Kingston Reif, "Moon Reverses THAAD Decision," Arms Control Association, September 2017.

[197] Yoo, 2012, p. 342; Keith Johnson, "Why Are Japan and South Korea at Each Other's Throats?" *Foreign Policy*, July 15, 2019.

[198] Snyder, 1997, pp. 183–185, 186–189.

Japan

Historical Background

Japan is often held up as one of the United States' best access partners in East Asia. One reason for this is the historical relationship between the two countries. When the American military defeated the Empire of Japan in 1945, it was widely seen more as a liberator than a conqueror.[199] Washington did force a pacifist constitution on Tokyo after the war, but many Japanese elites and people welcomed the restrictions it placed on their own military, so much so that when the United States tried to encourage Japan to re-arm during the Korean War, Japanese politicians fought to keep these constitutional restraints in place.[200] In 1952, the American occupation of Japan formally ended, greatly reducing the number of American troops and facilities in the country, although thousands remained.[201]

Following the end of the U.S. military occupation, the security treaty that the United States signed with Japan stood out even among the so-called semicolonial defense treaties Washington imposed on its Asian allies in the 1950s as especially lopsided. It gave the U.S. military unrestricted use of Japanese territory and airspace, explicitly stated that American forces on Japanese territory were there to respond to regional contingencies that may or may not have anything to do with Tokyo, and did not include any language obligating the United States to defend Japan. The treaty even included language authorizing American troops to intervene in Japanese domestic politics or disturbances.[202] Throughout the 1950s, this arrangement proved increasingly unpopular, and, by 1960, Japanese Prime Minister Kishi Nobusuke was able to negotiate a more equitable treaty that eliminated language that could justify American intervention in Japanese domestic politics, obligated the United States to defend Japan, increased Japanese jurisdiction over off-duty American soldiers, and required the United States to "consult" with Japan before using its facilities there to respond to regional contingencies.[203]

Although the end of the security treaty controversy would largely end antiaccess protests in most of Japan until the Vietnam War, resentment continued to simmer on Okinawa.[204] This small island almost 1,000 miles southwest of Tokyo had been a major battleground of World War II, where massive American shelling and mass civilian suicides enforced by Japanese troops had killed about one-third of the local population.[205] The occupation ended for most of Japan in

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[199] Calder, 2007, pp. 103–104.

[200] Cooley, 2008, p. 177.

[201] Cooley, 2008, p. 177.

[202] Cooley, 2008, pp. 178–179.

[203] Smith, 2006, p. 15; Cooley, 2008, pp. 183–184.

[204] Hook and Son, 2013, p. 25.

[205] Calder, 2007, p. 166; Norimitsu Onishi, "Okinawans Protest Japan's Plan to Revise Bitter Chapter of World War II," *New York Times*, October 7, 2007.

1952, but Okinawa remained under American administration, and American heavy-handedness in evicting farmers from their land to build or expand military bases in the 1950s led to massive, bloody protests involving around 160,000 people in 1956.[206] Because Okinawa was administered by the American government and not by Japan, the revised 1960 mutual defense treaty did not apply, and U.S. service members continued to enjoy full extraterritoriality on the island.[207] Throughout the 1960s, Okinawans became increasingly strident in their demands that they be returned to Japanese administration. In 1968 the adamantly anti-American Yara Chobyo became Okinawa's first popularly elected governor, and in 1969 Washington agreed with Tokyo to return Okinawa to Japanese administration by 1972, which would make the 1960 mutual defense treaty's provisions applicable to all American bases there.[208]

Although the reversion deal was widely popular in most of Japan, it was condemned on Okinawa.[209] The Okinawans had agitated for reversion but were dismayed that they were not consulted during negotiations.[210] Okinawa had always been the home of an abnormally large number of American military bases, and in 1972 a major restructuring of American bases throughout the country moved more facilities to the island, making it host to 70–75 percent of all American installations in Japan.[211] Many Okinawans (including Yara) were angered by this inequality and had hoped that reversion would be accompanied by the removal of all American bases from the island.[212] Criminal jurisdiction was also an issue, and following the 1970 acquittal of an American officer accused of manslaughter by a military tribunal, 700 protesters broke into Kadena Air Base and burned 73 cars.[213]

Following an economic crisis in the late 1970s, antiaccess activism began to die down on Okinawa as moderate politicians emphasized strong economic relations with Tokyo.[214] In 1995 the gang rape of a 12-year-old schoolgirl by American soldiers once again ignited antibase protests across Okinawa, culminating in an 85,000-person demonstration in 1996. The local government and media issued a chorus of demands from across the political spectrum for reductions in the number of troops on the island and greater restrictions on their activities.[215] In

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[206] Cooley, 2008, p. 145.

[207] Smith, 2006, p. 15; Cooley, 2008, p. 145.

[208] Cooley, 2008, pp. 148–149.

[209] Cooley, 2008, p. 190.

[210] Cooley, 2008, pp. 148–149.

[211] Cooley, 2008, p. 181.

[212] Smith, 2006, p. 15; Cooley, 2008, p. 181.

[213] Cooley, 2008, p. 149. Note that because this occurred before 1972, the 1960 revisions to criminal jurisdiction over American military personnel likely did not apply. It nevertheless led to major protests and demands for SOFA reform, despite the fact that the 1972 reversion would bring about substantial reforms automatically.

[214] Cooley, 2008, pp. 150–151.

[215] Calder, 2007, pp. 166–167.

response, Japanese Prime Minister Hashimoto Ryutaro and American President Bill Clinton commissioned the Special Action Committee on Okinawa, which recommended among other things that the U.S. Marine Corps air base at Futenma, in the center of Ginowan city, be shuttered and moved to a more remote location to minimize its impact on the locals.[216] Washington and Tokyo accepted these recommendations and planned to build a new airstrip in Camp Schwab near the city of Nago. Once again, the Okinawans were not consulted, and although there was and continues to be widespread support for the removal of the Futenma base, most Okinawans want it moved outside Okinawa, not merely shuffled to a more remote location on the island.[217] Even relatively moderate Okinawan politicians have opposed the construction of a permanent facility at Camp Schwab, and repeated administrative action, protests, and lawsuits from the local government and population have held up construction for decades.[218] At present, the runway is still under construction and still faces staunch opposition from Okinawan officials and civil society groups.[219]

Outlook for Future Access

There are several reasons to believe that Japan will be unlikely to challenge peacetime access and may prove more willing to allow contingency access than other countries in the region. Calder argues that nations that have been "liberated" (i.e., had an unpopular government overthrown) by another country are less likely to oppose peacetime access for the armed forces of the liberator. Liberators, he argues, are in a position to have so many troops in the host state that they can significantly reduce the number of soldiers in country after the end of an occupation while still maintaining a substantial presence, to deploy troops to many bases across the country (although it should be noted that this does not seem to apply to Japan, where about 70 percent of all bases are on Okinawa), and to legitimately purge hostile elements from the government.[220] Widespread opposition to the bases in the 1950s may call some of Calder's optimism into question, but after the 1960s the American legacy in Japan left no substantial nationalist opposition to access, as in the Philippines, nor was it tainted by association with past dictatorships, as in South Korea.

Overall, America's soft power advantage in Japan over China is especially stark, largely because Japan has consistently been among the Asian nations most skeptical of Beijing. Although the portion of the Japanese population with a positive view of China has risen from its

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[216] Calder, 2007, pp. 167–168.

[217] Cooley, 2008, pp. 155–156; Calder, 2007, pp. 167–168.

[218] Hook and Son, 2013, pp. 28–29.

[219] Kyodo News, "Okinawa Files Another Lawsuit over U.S. Base Landfill Work," *Japan Times*, July 17, 2019.

[220] Calder, 2007, pp. 103–104. Note that Calder claims that a country can lose its "liberator" status through incompetence or association with a dictatorial regime.

nadir of 5 percent in 2013, it was only at 17 percent in 2018, whereas 78 percent had an unfavorable view. Meanwhile, 67 percent had a favorable view of the United States.[221]

The nature of the Japanese government also helps shore up support for access. Despite legislative conflict causing significant opposition to access in the 1960s, most issues regarding the alliance are currently handled by the executive branch and a variety of institutionally proalliance bureaucracies.[222] As in South Korea, even relatively anti-American candidates seem to moderate their stance on the alliance after becoming prime minister.[223] Japanese prime ministers are in some ways even more restricted than South Korean presidents in changing access policy because of the exceptionally strong and generally proaccess Japanese bureaucracy.[224] Even within the legislature, most major parties support the alliance, and defense policy is generally formulated by a small group of *zoku*—special policy circles that bring together legislators, interest groups, and bureaucrats—further institutionalizing the process and insulating it from shifting political forces.[225] Finally, the Japanese government is unmistakably a democracy, and the fact that the current Treaty of Mutual Cooperation and Security Between the United States and Japan was negotiated by elected officials who were able to assert Japanese interests has deflected attacks on its legitimacy, despite the tempestuous events that accompanied its 1960 ratification. In 1970, the Japanese legislature allowed the treaty to be automatically extended without any major debate or protests.[226]

There is a high degree of consensus among Japanese policymaking elites that the American military presence in Japan is fundamentally conducive to regional stability and Japanese security in general, even without any clear and present threats to Japan's survival.[227] As noted, even opposition politicians who promise on the campaign trail to get tough with the United States tend to moderate their views once in power—and this has been especially true when the overall security environment in East Asia becomes less stable.[228] This makes any successful challenge to peacetime access highly unlikely and makes Japan far more amenable to requests for contingency access. Even when local governments oppose access, the U.S. military can almost always find an ally and mediator in Tokyo.

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[221] Pew Research Center, undated.

[222] Kawato, 2015, p. 174; Smith, 2006, p. 18.

[223] The key example being Prime Minister Hatoyama Yukio, who initially opposed the relocation of the marines of Futenma to Camp Schwab but eventually caved to American pressure to accept the plan.

[224] Kawato, 2015, p. 174; Smith, 2006, p. 18.

[225] Cooley, 2008, p. 193.

[226] Cooley, 2008, p. 190.

[227] Yeo, 2011, p. 178; Pettyjohn and Kavanagh, 2016, p. 51. Note that events such as North Korean missile launches or Chinese aggression that increase tensions in the region or threaten Japan do have a tendency to increase proaccess behavior. See Smith, 2006, p. 17.

[228] Envall, 2013, pp. 391–393.

Even though the Japanese central government tends to be staunchly proaccess and the general public consistently supports the Japanese-U.S. alliance, local governments and populations often oppose any increase in military activity at nearby bases. Residents and leaders from areas near Kanoya Air Base, Iwakuni, and Yokota have all taken political, administrative, or legal action to oppose the deployment of new units or military activities at nearby bases.[229] The Japanese government has been struggling to find a place to build a replacement for the Iwo Jima carrier landing-practice airfield since the 1980s, but local concerns and demands for exorbitant land prices for a replacement facility have stymied its efforts.[230] Despite Okinawa's pleas for other prefectures to share the burden of hosting American troops, none has proven willing to accept the relocation of the U.S. Marines at Futenma within its borders.[231] Washington and Tokyo have generally been able to redeploy forces and engage in new activities at old bases despite local resistance, but local governments can make changes more costly and slower, possibly causing problems for contingency access. Sometimes, as has thus far been the case with Camp Schwab and Iwo Jima, local resistance can derail redeployment plans altogether or cause them to take decades. Japan's robust legal system provides many options for savvy antiaccess activists to challenge access arrangements, and its pacifist constitution continues to provide both a rallying cry and a potent legal weapon for those who would oppose any action that could embroil Japan in a military contingency outside its borders.[232]

Local activists have proven especially adept at opposing access on Okinawa. Contingency access has historically been an issue, with the United States choosing not to base B-52 Arclight missions on the island during the Vietnam War because Washington felt that doing so would lead to major political opposition.[233] About 90 percent of Okinawans opposed the introduction of the new Marine Corps V-22 Osprey aircraft to the island, and many opposed the movement of the Futenma Marines to a different part of Okinawa, demanding instead that they be relocated outside the island.[234] It is thus unlikely that they would look kindly on any future influx of new troops or equipment in response to a nearby military contingency. To be fair, many Okinawans remain ambivalent about the bases: A February 2019 referendum attracted only a 52 percent participation rate and only about one-third to one-half of the island's overall population voted to

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[229] Calder, 2007, pp. 168, 226; Hook and Son, 2013, p. 29; Hana Kusumoto, "Air Force Will Pay Japanese City $7 Million over Noise Complaints," *War Is Boring*, June 10, 2019.

[230] James Bolinger, "Japan Stalled in Hunt to Replace Iwo Jima as Site for U.S. Carrier-Landing Practice," *Stars and Stripes*, May 24, 2019.

[231] Kawato, 2015, p. 177.

[232] Smith, 2006, p. 16.

[233] Pettyjohn and Kavanagh, 2016, p. 129.

[234] Hook and Son, 2013, p. 29; Charles E. Morrison and Daniel Chinen, *Millennial+ Voices in Okinawa: An Inquiry into the Attitudes of Young Adults Toward the Presence of U.S. Bases*, Honolulu: East-West Center, April 2019, p. 22.

oppose the Camp Schwab expansion.[235] Even so, Okinawan antiaccess activists have been more successful than their counterparts elsewhere in Japan, using a series of lawsuits and administrative action (mostly refusing to issue permits) to prevent or delay construction of the Camp Schwab replacement facility for the Marine Corps base at Futenma for more than 20 years. This local resistance is especially problematic because Okinawa hosts almost three-quarters of all American military installations in Japan and occupies an unparalleled strategic location, only a few hours from Taiwan via V-22 Osprey.

It should be noted that, in general, the Japanese government has worked to ensure that local resistance does not have a negative impact on American military operations. In most of the cases mentioned above (Yokota, Iwakuni, and Kanoya) Tokyo has refused to limit or alter military operations despite local protests. Although the central government has not yet been able to overcome local resistance to complete the Camp Schwab runway on Okinawa, it has refused to close Futenma until the new facility is completed despite vociferous local protests, ensuring that American Marines on the island still have access to the facilities they need. The government has also worked to reduce or find ways around legal restrictions on its military to support American operations around the globe, such as sending reconstruction support personnel to Iraq or conducting naval ship refueling operations on the Indian Ocean to help America's war effort in Afghanistan.[236] Even though local resistance could complicate contingency access, the Japanese government has in the past usually proven willing and able to find ways to ensure that the American military has the facilities it needs.

One of the most helpful measures that the central Japanese government has taken to support access has been its generous compensation programs for those harmed by American military activities. The Japanese Defense Facilities Administrative Agency, which is tasked with distributing these compensation dollars, is an independent cabinet-level agency with an annual budget of around $5 billion, or around 11 percent of Japan's defense budget.[237] The agency's independence from the Japanese Ministry of Defense enables it to act as a trusted mediator between the Japanese and American militaries and the civilians whose lives are affected by the noise, crime, pollution, or other side effects of military operations. Its local offices nearby most major military facilities in Japan enable it to address the "delicate details" of compensation.[238] As noted in the "Widespread Pressure to Deny Access" section of Appendix B, local populations tend to bear a disproportionate share of the cost of military installations without enjoying any

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[235] Morrison and Chinen, 2019, p. 22; "72% of Okinawa Voters Oppose Work off Henoko for U.S. Base," *Asahi Shimbun*, February 25, 2019. The article notes that about 434,000 people voted to condemn the base expansion out of a population of about 1.1 million voters and 1.4 million residents on the island. More than 70 percent of those who voted condemned the expansion, but voter turnout for the resolution was only 52.48 percent.

[236] Brad Glosserman and Scott A. Snyder, *The Japan-South Korea Identity Clash: East Asian Security and the United States*, New York: Columbia University Press, 2015, pp. 124, 128.

[237] Calder, 2008, p. 133.

[238] Calder, 2008, pp. 133–135.

added share of the benefit, and in theory these payments can help alleviate that dynamic by compensating them for their disproportionate burdens and creating constituencies who are incentivized to keep bases in place.[239] In addition to incentivizing individuals, Tokyo uses the provision or denial of subsidies and local development projects to incentivize local governments to accept nearby military operations.[240] Since reversion in 1972, the central government has transferred about $80 billion to Okinawa, much of it in the form of compensation or rent payments related to the bases.[241] In their 2014 examination of Okinawan gubernatorial elections, Kagotani and Yanai called the utility of these payments into question by noting that the level of economic dependence of an Okinawan city on U.S. military bases and compensation payments did not have a significant impact on that city's vote for probase candidates over time, but they did note that it could have helped account for relatively high baseline support for probase candidates in some cities.[242] The issue of compensation did seem to be a major factor in the defeat of some stridently antibase governors, such as Taira Kōichi in 1978 and Ōta Masahide in 1998, both of whom were beaten by moderate candidates who emphasized the economic benefits of taking a softer stance on the bases to mend fences with Tokyo.[243]

The access problems encountered by the United States in Japan demonstrate both the limits and the strengths of soft power. Despite overall public support for the American military presence and a high level of elite consensus in favor of access, shifts or increases in the deployment or activities of American forces in the country are often met with protests from local people who resent being asked to bear a disproportionate share of the burden of the nation's defense. In Okinawa, this is especially so, and many young Okinawans are not so much in favor of the elimination of all American facilities in Japan as they are in favor of a more equitable distribution of those facilities.[244] Even so, the long-term support of the general public is important and has helped to build an institutionally reinforced belief among decisionmaking elites that keeping the American military in Japan is good for the nation's security. Although protests complicate access, Tokyo has generally ensured that the American forces in Japan have access to the facilities that they need and worked to mollify aggrieved locals. Securing widespread access to nontraditional basing locations could be difficult in a conflict that does not directly involve Japan, but the pro-American consensus in the Japanese government is likely to make Japan one of the better candidates for AB.

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[239] Calder, 2008, p. 130.

[240] Glen D. Hook, "Intersecting Risks and Governing Okinawa: American Bases and the Unfinished War," *Japan Forum*, Vol. 22, Nos. 1–2, 2010, pp. 206–208.

[241] Hook and Son, 2013, p. 30.

[242] Kagotani and Yanai, 2014, pp. 110–111.

[243] Cooley, 2008, pp. 150, 155–156.

[244] Morrison and Chinen, 2019, p. 17.

Conclusion

Nationalism, the burdens of living near a military installation, and the risk of retaliation by foreign powers are all likely to lead local residents to resent any attempts by USAF to use facilities near their homes, even in Japan and similar countries, where the United States enjoys a substantial soft power advantage over its adversaries. Because the cluster, shell game, and FARP/drop-in basing concepts call for the use of many bases, possibly colocated with civilian infrastructure, this resentment could pose a significant challenge. That being said, host governments that are committed to allowing the U.S. military access (often supported by a general public that is supportive of access, even if local residents are not) are usually capable of coercing, co-opting, or compensating local protesters such that their actions do not impede operations, although it is possible that host governments may choose basing sites based on likely local reactions to U.S. forces, as well as operational concerns. This could place additional burdens on the MAF if required to use suboptimal facilities. That being said, when a consensus forms among local decisionmaking elites in favor of allowing military access, antiaccess activists usually find it quite difficult to change policy and deny access in a way that seriously impedes operations.

Convincing decisionmaking elites in East Asia to provide the U.S. military with contingency access in a conflict with China could be difficult, particularly given China's substantial economic and military hard power. In asking local leaders to facilitate AB for operations against China, American commanders are asking them to shoulder massive economic burdens, to risk the security of their nation and safety of their people, and to forgo substantial economic benefits. In general, convincing elites is easier when military access decisions are made by the executive branch and bureaucracy and harder when legislators or local governments have greater influence or veto power over access policy. Persuading decisionmakers to allow contingency access is also easier when the host country is an *enduring partner* that sees U.S. forces as fundamentally important to its security, even in the absence of direct threats. In addition, it would likely be much easier to convince the leaders and publics of potential host nations to support AB on their territories if they are directly involved in a conflict. It is possible that American or Chinese soft power could affect the choices of decisionmakers, especially in democratic states and states in which legislators and politicians have a more direct influence on military access policy, but the ways in which this influence is exerted are not well understood. The existence of a popular consensus in favor of an alliance with Washington does seem to have helped Seoul and Tokyo preserve access in the face of local protests, but local protests against changes to American military deployments remain common across Japan, despite the fact that America's soft power lead over China is greater there than in almost any other country.

Ultimately, the results of this analysis suggest that in addition to the dangers of enemy bombardment, shifting local politics may present another variable that would require greater flexibility from USAF commanders in executing AB concepts. Countries tend to shift their level

of contingency access over the course of a conflict, and Air Mobility Command may need to be able to respond quickly both to close bases as host governments restrict American operations or to open new bases as newer and better locations are made available.[245] It may be advisable for commanders to secure permission to use as many facilities as possible in multiple host nations even if there is no immediate need to use so many airfields, so that if one set is denied or restricted, another can quickly take its place. Ultimately, the level of access granted would depend on the nature of the contingency the United States is responding to, and so it is impossible to predict with certainty how local nations would respond. That being said, it may behoove the United States to work with states in the region to negotiate agreements, such as the Philippines' Enhanced Defense Cooperation Agreement. These agreements designate possible locations from which the United States could operate, so that if they do allow access, less time would be needed to identify basing sites. It would also be wise for the United States to begin assessing officials and decisionmakers in potential host states to determine under what circumstances they would consider allowing access for AB. American leaders could also work to negotiate in advance for more-proactive support in a contingency, such as the use of local roads and trucks, security personnel, and refueling capacity. Host-nation elites would ultimately have veto power over any possible AB arrangement on their soil, and it would be prudent to include them in the planning process to avoid making operationally optimal plans that are not politically feasible.

[245] Pettyjohn and Kavanagh, 2016, pp. xv–xvi.

Appendix C. Historical Case Studies

As noted in Chapter 1 of the main report,[246] AB concepts have been considered in recent years as a response to growing adversary missile capabilities. But the challenges of operating in contested environments and the principles and practices of AB are not entirely new. This appendix presents two case studies from World War II: (1) Guadalcanal, which illustrates how U.S. forces sought to maintain sortie generation at an airfield under attack, and (2) Operation Matterhorn, which illustrates how distributed operations enabled bomber sorties against the Japanese main island. We identified cases from World War II because they provided robust examples of the United States leveraging AB concepts in a conventional context, which proved useful in thinking about today's geopolitical environment. Additionally, these two cases work together in offering both an example in which the United States was more successful and one in which the United States had more difficulty. From these case studies, we draw implications and lessons for operations in the current context.

Guadalcanal: An Airfield Under Attack

Operating from a contested environment continues to perplex military planners today. The U.S. military has enjoyed rear-area sanctuary for decades. However, World War II, particularly U.S. efforts in the Pacific, illustrates that though this continues to be a vexing a problem, it is not new. This section uses the U.S. experience at Guadalcanal to derive a series of insights applicable to today's fight. In particular, we examine how the United States generated combat power each day despite daily Japanese attacks and the challenges of operating from a crude, forward base. We first identify the strategic imperative facing the allies in 1942, then explore a set of strategic factors and operational enablers that allowed the United States to continue generating sorties. We end with a discussion of the main findings that can be applied to AB and global mobility discussions today.

Strategic Imperative

By the spring of 1942, Japan started to advance in the Pacific theater after capturing New Guinea, New Britain, and the Philippines,[247] forcing the United States to act or face defeat. The United States chose to act, with Guadalcanal as the starting point. Through intelligence gathered from coast watchers—units situated throughout the Pacific that tracked Japanese actions—the

[246] Orletsky, Brown, DeBlois, Mills, Norton, Brackup, et al., 2023.

[247] Peter F. C. Armstrong, "The Battle of Guadalcanal: A 50-Year Retrospective," *Marine Corps Gazette*, Vol. 76, No. 8, August 1992, p. 75.

Allied forces learned that Japan named Guadalcanal as its next target.[248] This posed grave implications for the Allies.

If successful in seizing Guadalcanal and building an airfield, Japan would be able to threaten allied sea lane supply routes from Australia and potentially threaten Australia itself.[249] If the Allies hoped to launch a counterattack in the Pacific, they needed Australia.[250] Without Australia the only options to supply future operations in the Pacific became Hawaii or California, both of which were highly undesirable. As a result of these strategic imperatives, the United States decided to challenge Japan at Guadalcanal. The stakes were high given that both the United States and Japan viewed Guadalcanal as instrumental to their larger strategies to win the Pacific theater.[251]

Though the battle at Guadalcanal was initially viewed as a solution to the problem of an advancing Japan in the Pacific, it soon invited a host of new logistical and operational challenges. Most important, the U.S. military would need to quickly figure out how to operate from an airfield under constant attack. The next sections explore how the U.S. military approached, and ultimately solved, the operational conundrum of generating sorties from an airfield attacked daily, or what is now referred to as a contested operational environment.

Operational Challenges

Contested Environment

When U.S. Marines landed on Lunga Point on August 7, 1942, conditions were anything but promising. As shown in Figure C.1, Lunga Point was on the coast of Guadalcanal and the target landing point for the Marines Corps' amphibious assault. By the time the United States decided to seize Guadalcanal, Japan had already begun occupying the island and building an airfield. Fortunately, Japan did not expect the U.S. invasion, and the Marines arrived largely uncontested.[252] However, that soon changed.

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[248] Lawrence Spinetta, "The Other Cactus Air Force," *Aviation History*, Vol. 25, No. 5, May 2015.

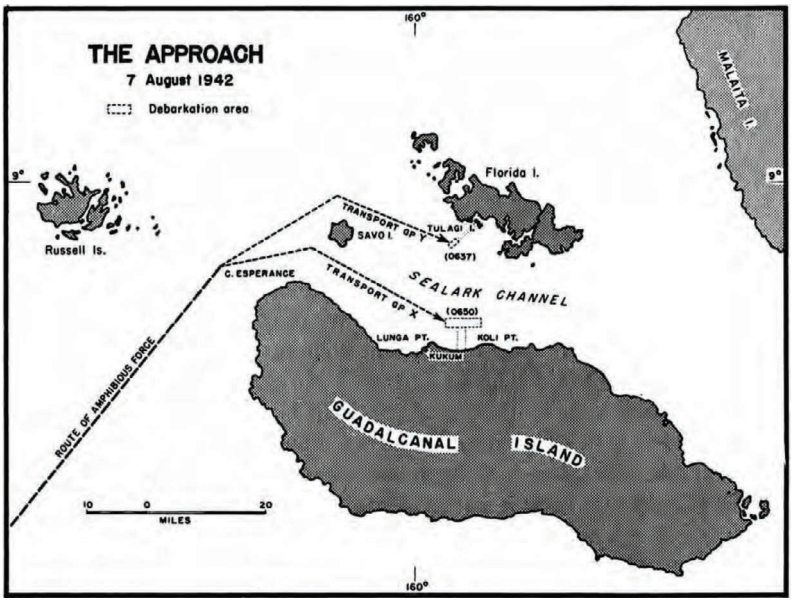
[249] Chris Rein, "Guadalcanal: A Case Study for Multi-Domain Battle," *Military Review*, May–June 2018, pp. 94–95.

[250] Armstrong, 1992.

[251] Greg Lane, "Operation Watchtower: Soldiers Were Key in World War II's First U.S. Offensive," *Army Magazine*, May 2017.

[252] John Miller Jr., *Guadalcanal: The First Offensive*, Washington, D.C.: Center of Military History, U.S. Army, 1995, p. 61.

Figure C.1. Amphibious Assault at Lunga Point



SOURCE: Miller, 1995, p. 60.

Hours after the first amphibious assault, Japanese bombers from Rabaul attacked U.S. supply ships and, though inflicting limited damage, severely delayed the Marines from unloading needed supplies.[253] This was the first of what would become daily and nightly attacks by the Japanese at Rabaul. During the day, aircraft from Rabaul and other Japanese outposts would attack the airfield during *Tojo time*. The forces on Henderson Field started referring to the bombing attacks as *Tojo time* because they occurred each day almost exactly at noon. By night, Japanese destroyers would evade U.S. aircraft range and heavily shell the airfield. The "Tokyo express"[254] consisted of Japanese resupply and reinforcement missions through the New Georgia Sound (*the Slot*) that ended with a shelling of Henderson Field.[255] These attacks persisted for months. Further, the Allied personnel (pilots, mainly) and aircraft were outnumbered and outmatched in comparison to the Japanese. Japanese aircraft, particularly the fighters (Zeros) were faster, better climbers, and more maneuverable than the U.S. fighters.[256] These factors contributed to the difficult situation facing the United States at Guadalcanal.

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[253] Miller, 1995, p. 77.

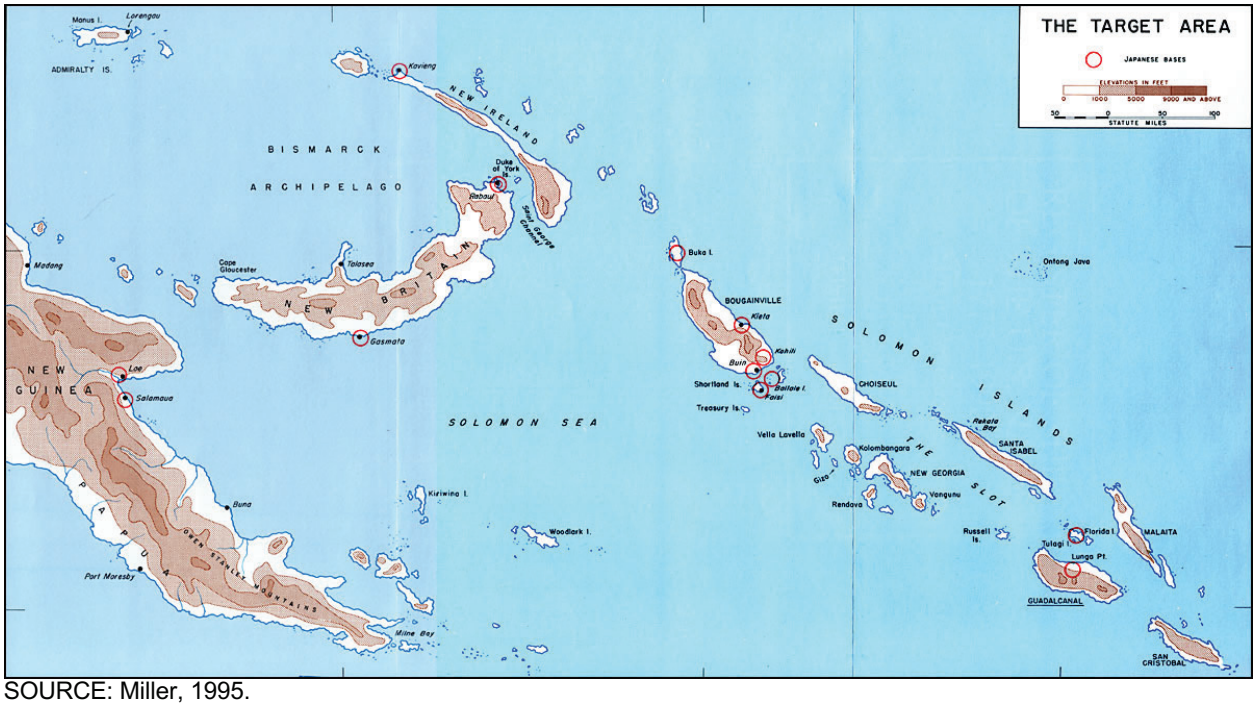
[254] Many nights the Japanese cruisers would come through the Slot (the New Guinea sound), which was out of the range of U.S. aircraft in the evening. They were trying to bring in supplies, mainly personnel, to Guadalcanal to support the Japanese presence on the island. Before the destroyers left to return back to their outpost, they would heavily shell Henderson airfield.

[255] James D. Hornfischer, *Neptune's Inferno: The U.S. Navy at Guadalcanal*, New York: Bantam Books, 2011, pp. 109–113.

[256] Jeff D. Philippart, *The Expeditionary Airfield as a Center of Gravity: Henderson Field During the Guadalcanal Campaign (August 1942–February 1943)*, Maxwell Air Force Base, Ala.: Air University Press, 2004, p. 9.

In addition, the enemy nearly surrounded the island with Allied outposts in short supply. Japanese outposts ranged from Buka, 363 miles from Guadalcanal, to Shortlands, 285 miles away, to Rabaul, which was situated 565 miles from Henderson Field.[257] Figure C.2 gives a snapshot of the Japanese enemy outposts surrounding Henderson. These Japanese strongholds ensured that Japan could continue to leverage aircraft and ships to sustain attacks from August 1942 to February 1943.

Figure C.2. Japanese Bases in the Solomon Islands



SOURCE: Miller, 1995.

Crude U.S. Airfield

Complicating matters further, even without the daily airfield attacks, operating conditions on Guadalcanal were extremely crude. Guadalcanal lacked fuel trucks, repair buildings, aircraft hangars, and a suitable airstrip. Before forces completed an operational airstrip in September, Henderson Field consisted of loose gravel and rolled dirt, causing just as much damage to aircraft initially as did enemy attacks. Also, maintenance processes were almost entirely manual. Fuel was manually loaded onto aircraft, going through an initial labor-intensive process to remove condensation, which could take hours for only a few aircraft. In addition to fuel, munitions were handloaded into aircraft because the base lacked a bomb-hoisting device.[258] These processes strained manpower and precious time.

[257] Miller, 1995, p. 81.

[258] Richard Camp, "The Cactus Air Force's Humble Home," *Naval History*, Vol. 31, No. 4, August 2017a.

Overcoming Strategic and Operational Challenges

Although the strategic impetus was focused on Guadalcanal, executing a campaign to first take Guadalcanal and then seize Rabaul proved extremely difficult in practice. To overcome these less-than-ideal conditions, the United States utilized a combination of strategic factors and operational enablers to continue generating combat power each day. These included a joint approach; adept use of transport, runway repair, maintenance, airfield security, and air operations; creative development of a specialized force structure, and use of Guadalcanal's strategic location to impede Japanese air operations. We explore each of these strategic factors and operational enablers in the next sections.

Joint Approach

Due to Japanese attacks throughout the day, at night, and on the island itself, redundancy in manpower (skill sets), capabilities, and supply was paramount to U.S. operations on Guadalcanal. Operating from a contested environment at Guadalcanal added a degree of difficulty, unpredictability, and chaos to traditional operational functions of a military. Therefore, traditional U.S. military service roles and missions in 1942 did not apply to Guadalcanal.

The United States achieved some degree of redundancy and ability to operate in a multidomain environment through implementing a joint approach. Table C.1 shows that each primary function of U.S. operations at Guadalcanal had some form of a primary service lead and an alternative, or backup, service to provide reinforcements. These reinforcements and use of multiple services for the same function allowed the U.S. forces to remain operational when a heavy Japanese attack destroyed the U.S. Navy's ability to deliver supplies or strained the dedicated maintenance crews requiring another service to step in. The next subsections detail some of these functional areas, and the joint approach to each, to evidence how jointness proved to be a strategic factor contributing the United States' victory at Guadalcanal.

Table C.1. Joint Approach to Guadalcanal

Functions	Primary Service	Alternate Service
Transport (logistics)	• U.S. Navy	• AAF
Runway repair	• U.S. Navy	• U.S. Marine Corps
Maintenance	• U.S. Navy	• U.S. Marine Corps • AAF
Airfield security	• U.S. Marine Corps	• U.S. Army
DCA, CAS, interdiction	• U.S. Marine Corps AAF	• U.S. Navy

SOURCES: Robert Sherrod, *History of the Marine Corps Aviation in WWII*, Washington, D.C.: Combat Forces Press, 1952; Philippart, 2004; Wesley Frank Craven and James Lea Cate, eds., *The Army Air Forces in World War II*: Vol. IV, *The Pacific, Guadalcanal to Saipan*, Chicago: University of Chicago Press, 1950; Miller, 1995; Richard Frank, *Guadalcanal: The Definitive Account of the Landmark Battle*, New York: Penguin Books, 1990; Hornfischer, 2011.
NOTE: AAF = Army Air Forces; CAS = close air support.

Transport

The United States' capacity to provide continuous supply, despite Japan's often-successful efforts to interdict sea and air transport, allowed the United States to gain an advantage over Japan. To provide a consistent transport function, the United States had to rely on air transport when sea transport was not possible. Without a joint approach, many battles from August 1942 to February 1943 would not have been possible. Additionally, as the Japanese Army on Guadalcanal began to starve due to U.S. efforts at blocking Japanese supply to the island, the United States kept its own forces fed. Supply proved to be a force enabler for the United States at Guadalcanal but was only possible due to a joint approach.

At first, the U.S. Navy was the only source of supply. This arrangement was precarious but sufficient in the initial weeks at Guadalcanal. About a week after the first Marines landed on Lunga Point, Navy destroyers provided "400 drums of aviation gasoline, 32 drums of aviation lubricant, 282 bombs, belted ammunition, hand fuel pumps, tools, critical parts, and chamois skin for straining gasoline."[259] The U.S. destroyers were fast enough to evade air attacks from Rabaul and ensured that the first set of planes could at least generate sorties.[260] However, as the campaign progressed, Japan became more adept at targeting U.S. supply lines. In response, the United States started to leverage air transport to compensate for compromised sea transport.

Slowly, some aircraft trickled in and added to the supply and transport function. The use of aircraft to ferry in fuel during major battles kept forces alive on Guadalcanal, without which sorties could not have been generated. A major Japanese ground offensive in October 1942 on

[259] Sherrod, 1952, p. 78.

[260] Sherrod, 1952, p. 78.

Guadalcanal provides a useful example. During this battle, the U.S. ability to respond with a counterattack depended on fuel availability, which depended on air transport. On the morning of October 15, 1942, after major attacks from the Japanese destroyed personnel, aircraft, the field, and other resources, C-47s from neighboring allied outposts flew in drums of fuel that kept the aircraft in the air.[261] With each air transport that morning, the C-47s carried 12 drums of fuel, which was enough to keep 12 pilots airborne for 60 minutes.[262] These airborne pilots fought off Japanese aircraft, provided CAS for troops on the island, and kept the airfield operational.

Access to air transport when sea transport was unavailable helped U.S. forces operate in a contested environment in which Japanese interdiction efforts frequently compromised sea lanes.

Runway Repair

The Japanese military viewed the airstrip and larger airfield on Guadalcanal as its prime target, as it provided the most strategic value. If the United States could not generate sorties, Japan could gain air superiority and retake the island.[263] As a result, the Japanese forces on Guadalcanal continued to emphasize and target the runway, causing severe damage. Each day, Henderson Field came under attack by Japanese bombers and fighters during Tojo time,[264] and each evening the airfield was vulnerable to shellings from Japanese destroyers coming through the Slot. The result of these attacks was a crater-filled runway that needed to become operational by morning so aircraft could provide air defense. In addition, poor conditions and damaged aircraft landings caused destruction to the airstrip, threatening to delay sorties. Runway repair, which consisted of filling craters, smoothing the surface, and removing damaged aircraft, was an essential operational enabler at Henderson.

The United States used all services to repair the runway and keep the airfield operational. The Marine Corps and Navy ensured that the runway at Guadalcanal remained operational. At first, the Navy Seabees, a runway construction unit (discussed further below), had yet to arrive on Guadalcanal, forcing the Marine Corps engineers to assume maintenance and runway repair functions previously foreign to them. After arriving in September 1942, the Seabees performed the primary functions for runway repair, with the Marines taking on a support role.[265]

An example from the first months on Guadalcanal demonstrates how the Marines were able to perform multiple functions and contribute to a joint effort at Guadalcanal, which included conducting runway repair.[266] In that instance, 12 dive bombers waited on the Henderson airstrip, ready to take off loaded with 1,000-pound bombs, just as a B-17 from a nearby mission landed

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[261] Spinetta, 2015, p. 34.

[262] Spinetta, 2015, p. 34.

[263] Camp, 2017a, p. 5.

[264] See Miller, 1995, for a more detailed discussion.

[265] Philippart, 2004, p. 18.

[266] Philippart, 2004, p. 18.

severely damaged.[267] The impaired landing—the tires were shot off, and the pilot landed only with brake drums—damaged the runway enough that it required immediate repair for the dive bombers to take off. To do so, ground troops located near the beachhead abandoned their guns and grabbed the nearby equipment to remove the damaged B-17 and repair the runway. The ground troops and additional runway repair personnel successfully did so and allowed the dive bombers to take off. This example shows the usefulness, and even necessity, of having all personnel available and adaptable in their skill sets to perform various functions to keep Henderson operational. In this case, it took ground troops, pilots, and runway repairers just to get 12 dive bombers in the air.[268]

Further, the creative and agile use of materiel, equipment, and physical space of the base was essential to maintaining functional airfields. When the Marines arrived at Lunga Point, they did not bring the equipment necessary to move the dirt, gravel, and land to finish building the airstrip.[269] Initially, the Marines and Seabees used tools left over from Japan—road rollers, generators, trucks, hand carts, shovels, and other construction equipment—to fix a broken and crude airfield.[270] Once the forces overcame the first hurdle of constructing the airfield, they faced the next challenge of keeping it operational. Henderson Field consisted of black mud that, when wet, could turn into a molasses-like substance that thwarted further runway operations. Additionally, damaged aircraft often landed in ways that severely compromised the airstrip. SBDs, an American naval scout bomber aircraft, in particular had wheels originally intended for the hard surface of an aircraft carrier; Henderson's airstrip did not take these landings well.[271]

Forces on Henderson demonstrated great skill and agility in keeping the runway operational. The Japanese offensive from October 13 to 14, 1942, provides a useful example. On October 13, Japanese bombers heavily attacked Henderson, with Seabees struggling to keep craters filled and earth smooth enough to generate sorties.[272] In anticipation of bombing runs, Seabees had preplanned by loading dump trucks with earth to fill craters. The loads in each dump truck had been premeasured to fill the craters they expected the Japanese bombs to create. However, over a dozen craters still remained later in the day on October 13. That evening, Japanese ships entered through the Slot and attacked with a heavy shelling, undoing any progress the Seabees had made in repairing runway craters. The next day the Seabees worked tirelessly, but due to additional attacks, the runway was entirely inoperable by the afternoon of October 14.[273] As was stated earlier, redundant efforts proved invaluable at Henderson. The same proved true on October 14,

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[267] William J. Fox, "Building the Guadalcanal Air Base," *Marine Corps Gazette*, March 1944.

[268] Fox, 1944.

[269] Frank, 1990, p. 127.

[270] Frank, 1990, p. 127.

[271] Sherrod, 1952, p. 83.

[272] Craven and Cate, 1950, p. 55.

[273] Craven and Cate, 1950, p. 55.

1942. The Seabees had set aside another strip of grass roughly 2,000 meters long on Guadalcanal prior to the October offensive. The strip was not suitable for larger bombers any longer, but it could support lighter aircraft, which was enough to keep Henderson protected.[274] Forces operated from this strip, termed Fighter Strip No. I, for a week while the main airfield was repaired.[275]

The combination of creative personnel and dedicated runway repairs kept Henderson operational despite continued efforts by Japanese forces to destroy the airfield and gain air supremacy.

Maintenance

Aircraft were damaged each day at Guadalcanal from Japanese air attacks, poor runway conditions, and nightly shellings from Japanese destroyers. Because these attacks were almost certain to occur each day, it became paramount that aircraft return to quick operational status to protect personnel, capabilities, and transport efforts from the Japanese multidomain threat. To do so, maintenance was critical. Additionally, the effectiveness and versatility of maintenance efforts on Henderson meant the difference between a damaged and a destroyed aircraft. In a battle of attrition, whether or not an aircraft was damaged or destroyed had strategic implications.

The critical maintenance functions on Henderson involved refueling, rearming, and repairing aircraft. In turn, maintenance became a force multiplier at Guadalcanal, as the forces were adept at quickly returning aircraft to combat when they arrived from a mission low on fuel and most likely damaged. Dead-stick, or forced, landings and dogfights with Zeros were the primary sources of damage to U.S. aircraft. The maintenance crews were very resourceful. They used parts from unsalvageable aircraft returning from missions and searched through destroyed aircraft for leftover fuel and munitions. With supply constantly an issue, creativity and resourcefulness were key characteristics that allowed maintenance to be a true operational enabler during the campaign.[276]

The pace of the Japanese threat quickly stretched the available maintenance personnel thin. Attacks came all day and all night without any consideration for the number and availability of ground maintenance crews at Henderson. The manpower shortage was intensified by the time-intensive tasks often required at Henderson, such as taking apart an unsalvageable aircraft. However, the crews and personnel at Henderson understood the operational imperative and used resourcefulness, creativity, and grit to keep aircraft operational.[277]

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[274] Craven and Cate, 1950, pp. 54–56.

[275] Miller, 1995, p. 151.

[276] Philippart, 2004, pp. 16–17.

[277] Michael O'Neal, *Expeditionary Air Forces' Roots in the Past: Cactus Air Force*, Maxwell, Ala.: Air University, 1999, pp. 15–17.

A joint approach was essential to providing the necessary maintenance functions at Guadalcanal. The Marine Corps performed the first set of ground crew functions, including servicing and repairing aircraft on Henderson, until a dedicated ground crew arrived. Most often, this involved Marine Corps pilots responsible for the maintenance of their own planes. After the arrival of Cub One units (specifically designed as maintenance crews for advanced bases, as discussed below), the Marines took on a support role for maintenance. However, pilots from various services also needed to pitch in during operations to either fuel their own planes or learn how to perform various repairs. The joint contribution of dedicated Cub One units, plus pilots learning how to belt ammunition,[278] refuel, and repair their aircraft, addressed the shortage of ground maintenance crews on Guadalcanal.[279]

Airfield Security

Somewhat overlooked but essential to operations at Guadalcanal was the defense of Henderson from Japanese ground attacks. Airfield security and protection was a critical component that kept the airfield under Allied control. Japanese forces landed on Guadalcanal before the Americans; therefore, after taking Lunga Point largely unopposed, the United States faced a ground threat for remainder of the campaign. Further, because Japan devised a way to transport soldiers and supplies through the Slot, these forces were not defeated immediately.

In August and September, Japan embarked on two offensives to disrupt and defeat the perimeter defense in place around Henderson Field.[280] Both offensives failed due to Japanese intelligence that underestimated the strength of the U.S. forces. In October, another ground attack came from the Matanikau area, with Japan using several tanks equipped with guns and artillery fire to approach Henderson's perimeter. The Marine Corps, after employing antitank guns, hand-thrown grenades, and barrages, successfully forced the Japanese forces to retreat.[281]

The Japanese ground troops, using rifles, artillery, mortars, and sometimes tanks, had a tactic of sending waves of troops to attack Henderson. The famous ground battles include that of Bloody Ridge and the October offensive. During these, Marines were often outnumbered but retained control of the airfield and inflicted severe Japanese casualties.[282] Importantly, the Marine Corps (supported by the Army) ensured that no gaps or exposed flanks emerged in the perimeter defense. The lack of manpower forced Marines to use creative tactics and patrols to defend the entire airfield perimeter. The Marines, though not immediately after arriving, used

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[278] *Belting ammunition* refers to the act of reloading a weapon.

[279] O'Neal, 1999, pp. 15–17.

[280] The Marine Corps, with reinforcements from the Army, created a perimeter of roughly 22,000 yards around Henderson with five sectors to defend against the Japanese ground troops. The sectors each had a different commander and infantry unit.

[281] John Miller Jr., "Crisis on Guadalcanal," *Military Affairs*, Vol. 11, No. 4, 1947.

[282] Philippart, 2004, p. 20.

Howitzers based inside the perimeter and barbed wire outside the perimeter. These creative approaches to base defense helped the Marine Corps account for manpower shortages.[283]

With thousands of Japanese troops on the island, the United States had to figure out how to defend Henderson on the ground in an already resource-constrained and manpower-constrained environment. To do so, the United States used the Army and Marine Corps, under the command of General Alexander Vandegrift, commander of the 1st Marine division. The use of Marine Corps and Army units were instrumental in keeping the airfield secure, particularly at night. Although the Marine Corps provided the primary source of perimeter defense in the early months on Guadalcanal, the Army soon came to reinforce these overstretched units. Importantly, the use of both Army and Marine Corps forces ensured that, geographically, all points of Henderson were accounted for.

General Vandegrift used the Marine Corps to design a perimeter defense that would provide enough—though less than ideal—support to fend off persistent Japanese ground threats. Vandegrift specifically structured the Marines in light of the shortage of personnel, equipment, and firepower to properly secure the perimeter. Despite these gaps in defense, the Marine Corps, in conjunction with the Army later on, provided airfield security.[284]

On October 13, 1942, an Army unit arrived on Guadalcanal, with an attachment specifically intended to address the Japanese forces on the island and reinforce the current Marine Corps forces performing ground defense. These units came under General Vandergrift's command, indicating the jointness of this function.[285]

The Army provided perimeter defense and supported certain functions, such as artillery. The Army worked alongside the Marine Corps to combat Japanese ground troops, particularly in major battles during November. Initially, the Army was part of an effort to push the Japanese away from the airfield, but by January, the strategy had shifted to fighting and defeating the Japanese directly. The Army also provided artillery experience and personnel to direct at the Japanese forces on the island.[286] Some specific instances of Army support came in October and January of the campaign. In October 1942, the Army defended the eastern side of Henderson, causing nearly 1,000 casualties and preventing a Japanese ground offensive. Additionally, in January 1943, the Army's 25th Infantry Division employed artillery fire to support U.S. forces in seizing higher ground on Guadalcanal. These functions contributed to the continued operating status of Henderson while other ground defense troops (Marines, primarily) were needed elsewhere on the island.[287]

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[283] Miller, 1995, pp. 125–126.

[284] Miller, 1995, pp. 125–126.

[285] Miller, 1947, p. 197.

[286] Charles R. Anderson, "Guadalcanal," brochure, U.S. Army Center for Military History, October 2003.

[287] Lane, 2017, p. 43.

DCA, CAS, and Interdiction

DCA, CAS, and interdiction functions fell to the Marines, AAF, and Navy. Joint air operations on Guadalcanal became intertwined to the point that accepted roles and missions of the period no longer were relevant or adhered to. Typical tensions that might arise when all three services were performing overlapping functions did not ensue. Instead, the operational environment was such that they functioned as a team, picking up whichever air function was needed at the particular moment. Because the Navy and Marines used Henderson often as a place for carrier pilots and the aircraft to refuel and resupply, these pilots would be used for another operation after landing on Guadalcanal (CAS, interdiction attack on Japanese shipping, etc.). The operational demands were so intense, persistent, and overwhelming that the services jointly carried out all air operations during the battle for Guadalcanal.[288]

Use of Versatile and Dedicated Force Structure

Henderson field was a crude, advanced base with operating conditions that demanded a dedicated force structure with adaptability and versatility. The Navy formed the Cub One units for maintenance and the Seabees for runway repair and construction. All services contributed pilots to form the Cactus Air Force for air operations. We discuss a series of units assigned to Henderson that were dedicated to a specific function but remained versatile and adaptable in performing other activities when needed. These units were intended to be single-function units, or specialized; however, the operational environment at Henderson demanded that personnel quickly learn how to fulfill a variety of operational needs. The combination of specialized skill sets with versatility was essential to the U.S. ability to generate combat power at Henderson.

Cub One

The Cub One unit stemmed from Washington planners realizing the need for a specialized unit trained for creating advanced air bases. These units had code names as did the bases. A Lion base was a naval base intended to be roughly the size of Pearl Harbor, whereas Cub bases (also naval) were a quarter the size of a Lion base.[289] "Lions" were larger units for larger bases and "cubs" were smaller units for more intermediate advanced bases used for fuel and supply.[290] At first, Admiral Robert Ghormley, commander in the South Pacific, requested a unit of both the "Lions" and "Cubs" for the South Pacific.[291] Ultimately, only the Cub One unit reached Guadalcanal.

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[288] James A. Winnefeld and Dana J. Johnson, *Joint Air Operations: Pursuit of Unity in Command and Control, 1942–1991*, Annapolis, Md.: Naval Institute Press, 1993, p. 31.

[289] Gina Nichols, "Lions and Acorns and Cubs, Oh My!!" Naval History and Heritage Command, March 8, 2017.

[290] Frank, 1990, p. 137.

[291] Frank, 1990, p. 137.

The Cub One unit came to Guadalcanal somewhat by happenstance but soon became an essential factor to the forces located there. Initially, the Marines were to be met with aircraft—a dive bomber squadron and fighter squadron—which would require assistance from a ground crew. Due the nature of World War II, with resources limited and stretched thin, the requested Marine ground crews were still stationed in Hawaii. Given the operational imperative—at this point Henderson had been unprotected from the air for weeks and needed to begin generating sorties as soon as possible—the United States needed to find a timely solution. It just so happened that Cub One, a Navy unit designed for maintenance, had arrived at the nearby island of Espiritu Santo. The Cub One unit consisted of both personnel and equipment to refuel and resupply and advanced bases.[292]

In August, a unit of roughly 120 men from Cub One was sent to Guadalcanal. Though lacking some of the key skills, the men of these units became indispensable to operations on Henderson Field.[293] The adaptability and versatility of the Cub One unit members enabled them to service planes despite a lack of proper tools and facilities. These service members would use makeshift tools to perform such functions as refueling an aircraft without a fuel pump. This involved the use of makeshift funnels and strong personnel to hoist the heavy fuel drums. Other essential functions, such as the manual loading of bombs or hand-belting rounds of ammunition to fighters, were carried out by the Cub One units. The first Cub One unit also executed these maintenance tasks while low on personnel and without proper equipment before additional Marine Corps ground crew squadrons arrived to supplement the Cub One units.[294]

Seabees

The use of Navy Seabees to assist with initial runway construction and repair further highlights the creative use of manpower on Guadalcanal. The Pacific War created a need for the Seabees and thus marks their birth. After Pearl Harbor, the Navy started recruiting individuals with construction experience; as Vincent Transano, a Navy historian notes, "the Navy recruited from the older population who had built the Empire State Building, Boulder Dam and all the major projects of the 1930s."[295] These unique skills were in high demand because the Navy needed advanced bases built and maintained throughout the Pacific and could no longer rely on contracted workers.[296]

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[292] Peter B. Mersky, *Time of the Aces: Marine Pilots in the Solomons*, Washington, D.C.: Marine Corps Historical Center, 1993.

[293] Frank, 1990, p. 131.

[294] Mersky, 1993.

[295] Quoted in Robyn Loewenthal, "Seabee Days: The 50th Anniversary of the Group Will Be Celebrated in Festivities June 4–6 at the Port Hueneme Base," *Los Angeles Times*, May 28, 1992.

[296] Loewenthal, 1992.

Seabees became known as construction battalions, designed solely for construction functions overseas. Those who initiated the development of Seabee units consisted of civil engineers. Rear Admiral Ben Moreell, chief of the U.S. Navy's Bureau of Yards and Docks and of the Civil Engineer Corps, started recruiting men in their late thirties with a history of construction. Armed with a limited amount of training, these individuals were soon sent to the Pacific to assist forces, such as those on Henderson airfield, in runway construction and repair.[297] The history of the Seabees illustrates the use of units dedicated to a specific function in high demand at Guadalcanal. Having a unit dedicated entirely the maintenance and repair of Henderson was invaluable to U.S. operations and, as described above, allowed forces to anticipate attacks and prepare as much as possible. Without the Seabees, runway repair would be relegated to other units that did not hold the same specialized skill set in construction as those recruited to become Seabees. Runway repair was a constant, large-scale issue at Henderson that required the full attention of a unit with the requisite skill set.

The Cactus Air Force

To protect Henderson, the Cactus Air Force had to fulfill three primary functions: providing CAS for ground troops on the island, achieving air superiority from Japanese fighters, and opposing the Japanese destroyer ships coming through the Slot (the New Georgia Sound) at night. Composed of Army, Navy, and Marine Corps pilots, the Cactus Air Force provides perhaps the most unique account of a dedicated yet versatile and adaptable force employed at Guadalcanal. Given the number and variation in aircraft operated from Henderson and unpredictability in terms of operational needs, the only solution became an "all-hands" approach to aviation functions. These pilots were highly adaptive and versatile in that they frequently shifted between different types of operations, whether it be taking on a Zero directly or conducting an interdiction mission.[298]

Within the first month of operations on Guadalcanal, forces and aircraft from each service had arrived to build the Cactus Air Force. On August 20, a Marine Corps fighter squadron and dive bomber squadron, the first tactical air units on Guadalcanal, arrived. Next, the AAF arrived and contributed five P-400s. Lastly, Navy units landed a bomber squadron on August 24 from the USS *Enterprise*.[299] These were all hybrid units situated under a single Marine Corps command. On September 3, 1942, the first Commander, Aircraft, Guadalcanal (ComAirCACTUS) was established on Guadalcanal, signaling the unified structure of these disparate air units. To give a brief snapshot of the breakdown of forces on Henderson, the majority included Marine Corps pilots, with support from Army and Navy aviation personnel. As

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[297] Carol Marsh, "A History of the Navy Civil Engineer Corps, 1867–2007," Historian's Office, Navy Facilities Engineering Command, April 2007.

[298] Philippart, 2004.

[299] Winnefeld and Johnson, 1993, p. 26.

of September 22, 1942, there were 1,014 total aviation personnel on Henderson, with 33 of them Army and 64 Navy.[300] The ComAirCACTUS reported to both a Navy and a Marine Corps commander; however, in historical accounts this did not appear to cause any issues.[301]

The pilots of the Cactus Air Force performed multiple roles—from engaging in dogfights to supporting ground troops—allowing the force to remain agile in the face of a changing and persistent Japanese threat. At first, Army pilots arrived with P-400s and P-39s expecting to engage in air combat dogfights but came to learn that their aircraft was no match for the Japanese Zero. As a result, the Army pilots shifted to supporting ground troops on Guadalcanal, targeting the Japanese troops on the island and their landing barges.[302] Another illustration of adaptability comes from the use of Navy pilots on Henderson after the Japanese attacked carriers, rendering them inoperable. In September 1942 a series of U.S. ships—the *Wasp*, *North Carolina*, and *O'Brien*—were severely damaged or destroyed by Japanese torpedoes (by submarine) off the southeast coast of Guadalcanal.[303] Given the inactivation of these ships, whether temporary or permanent, the pilots and aircraft went to Henderson to help protect the airfield, personnel, and aircraft. In September, General Roy Geiger, the commander of the Cactus Air Force at the time, received TBFs (Navy torpedo bomber aircraft), SBDs, and the associated pilots. These reinforcements brought Geiger's total aircraft count to 58—enough for the Cactus Air Force to remain operational—by October despite losing roughly one to three aircraft per day during September to attack, weather, or poor runway conditions.[304] The Navy reinforcements allowed the Cactus Air Force to remain operational, as it was a battle of attrition between Japanese and U.S. forces.[305]

A given day for the Cactus Air Force consisted of some morning missions to intercept Japanese aircraft after a false or real alarm, Navy pilots flying on an interdiction mission to bomb a nearby Japanese outpost, fighters responding to the "Tokyo express" at noon and combating Japanese Zeros attacking the field directly, and then perhaps some late-afternoon sorties from Navy pilots aimed at interdicting Japanese destroyers and cruisers nearby.[306] The variability, frequency, and overlap of these functions ensured that once all the different services and airmen started operating at Henderson, they soon forgot which unit or service they started at. The Cactus Air Force adapted to the demanding operational conditions at Henderson to ensure that it could generate combat power each day and protect the airfield at Guadalcanal.

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[300] Sherrod, 1952, p. 91. This breakdown of personnel refers only to aviation.

[301] Winnefeld and Johnson, 1993, pp. 26–30.

[302] Sherrod, 1952, p. 82.

[303] These ships were escorting transports headed for Guadalcanal when they were attacked by Japanese submarines.

[304] Sherrod, 1952, pp. 90–91.

[305] Sherrod, 1952, pp. 90–91.

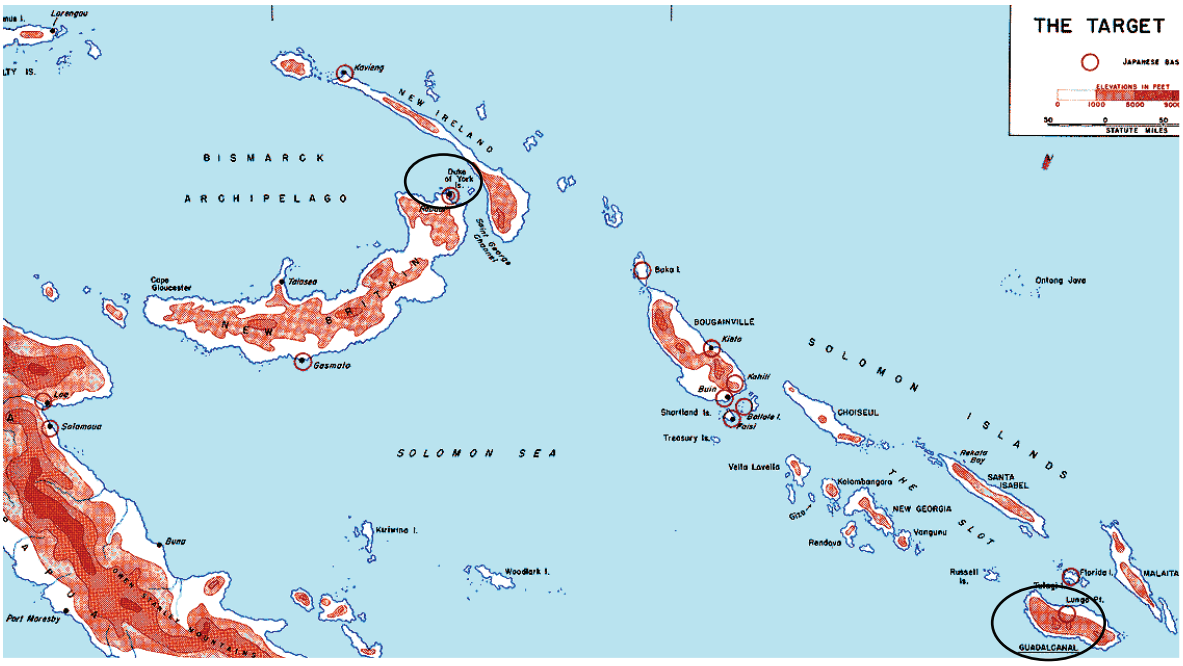
[306] Sherrod, 1952, p. 88.

Strategic Location

Another contributor to U.S. success at Guadalcanal was the strategic use of geography to compensate for poor aircraft performance and to prevent losses to capabilities and personnel. Because the United States fought from Guadalcanal, the territory that both Japan and United States wanted to control, it meant that the Cactus Air Force had homefield advantage. In a battle of attrition, this factor proved immensely advantageous for the United States.

Figure C.3 shows the strategic location of Guadalcanal and distance from Rabaul, the main Japanese base. Rabaul was roughly 565 miles from Guadalcanal, stretching the fuel use and flight times of Japanese aircraft.[307] Additionally, due to the distance, Japanese aircraft could not safely land anywhere but the ocean after getting hit in a dogfight.[308]

Figure C.3. Solomon Islands in 1942



SOURCE: Miller, 1995, with author overlay.

The distance between Guadalcanal and Rabaul, circled in black, illustrates the vast amount of ocean the Japanese forces needed to cover each day either by ship or air. These factors increased the likelihood that a Japanese pilot and aircraft would not survive a dogfight. In contrast, the homefield advantage allowed U.S. forces to compensate for less than ideal aircraft, supply shortages, constant attacks on the air base, and land attacks.

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[307] Miller, 1995, p. 4.

[308] Philippart, 2004, p. 8.

First, the Japanese fighter, the Zero, was more capable than the U.S. fighter, the F4F Wildcat, forcing the United States to rely on tactics that avoided prolonged dogfights. The Zeros could fly at higher altitudes, fly faster, and maneuver better than the Wildcats.[309] As a result, Marine Corps pilots focused their efforts on the Japanese Betty bombers. A typical DCA operation would consist of "a direct overhead or high-side pass on the bombers (to avoid their tail stingers); one quick burst at an attacking Zero (they flamed easily) then dive for home."[310] The only reason these tactics were possible was geography. The aircraft could quickly "dive home" because the fight was above the airfield. Further, because the Zero had to have enough fuel to fly roundtrip from Rabaul to Guadalcanal, fuel became a serious consideration and limitation. To ensure that they had enough fuel to return to Rabaul after attacking Henderson, the Zeros were careful to limit dogfights and avoid maneuvering at full throttle. To conserve fuel, the Zeros were also lightly armored, especially in comparison to the F4F Wildcats.[311] These factors allowed the fighters to compensate for shortfalls in maneuverability, climb capability, and speed. Similar to Zero, the Japanese bomber, the Betty, also compromised armament to save fuel.[312] Further, once Japan started operating the Zeros from Buin, 300 miles from Henderson, and the bombers from Rabaul, roughly 565 miles away, distance still favored the American forces.[313]

Additionally, the Marine Corps aircraft needed sufficient warning to reach the altitude necessary to fight the Japanese Zeros. Coastwatchers, units situated at nearby islands that provided early warning of Japanese aircraft headed for Guadalcanal, proved invaluable in accounting for this capability shortfall. The Coastwatchers lived in caves on Japanese-occupied islands—New Georgia, Vella Lavella, the Russells, Kolombangara—along the New Georgia Sound.[314] Because many of these islands were situated between Guadalcanal and Rabaul, the Japanese aircraft could not avoid flying over the Coastwatchers, allowing them to continue providing early warning.[315] Without the early warning, the Wildcats would not have been able to have enough time to fight the Japanese forces in the air. Oftentimes 40 minutes was sufficient for the aircraft to reach altitude.[316] Sometimes early warning was not possible, which resulted in a lack of aircraft able to confront the Japanese forces.[317]

Lastly, because reinforcements were significantly limited for the Cactus Air Force, it used geography and homefield advantage to reduce losses to aircraft and personnel. Leadership at

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[309] Sherrod, 1952, p. 83.

[310] Sherrod, 1952, p. 83.

[311] Philippart, 2004, p. 8.

[312] Philippart, 2004, p. 8.

[313] Sherrod, 1952, p. 84.

[314] Cyril J. O'Brien, "The Coastwatchers," *Leatherneck*, November 1992.

[315] Richard Camp, "Flying in the Eye of the Guadalcanal Storm," *Naval History*, Vol. 31, No. 4, August 2017b.

[316] Philippart, 2004, p. 7.

[317] Philippart, 2004, p. 7.

Henderson continued to request air reinforcements, stressing the strategic value of holding Guadalcanal from Japan. However, despite iterations of requests from Admiral John McCain and Ghormley, General Hap Arnold, Chief of the AAF, rejected the requests. Ghormley went so far as to state, "It is my considered opinion that at this time [September 1, 1942] the retention of Cactus [Henderson] is more vital to the prosecution of the war in the Pacific than any other commitment."[318] Resources were extremely limited, given U.S. commitments in two theaters (Europe and the Pacific). The strategic location of Henderson field meant the difference between a damaged aircraft and a destroyed aircraft for the United States.[319] Thus, without reinforcements, forces on Henderson had to salvage all parts of an aircraft, regardless of the degree of damage. Because damaged aircraft and pilots could land at Henderson after a dogfight, maintenance crews could perform miracles not available to Japan. For aircraft that could not be salvaged, the maintenance crews would take apart the aircraft and use it for spare parts.[320] The location of Henderson facilitated these tactics.

The strategic location of Guadalcanal, and the ability of U.S. forces to maintain control of the island, denied Japan the ability to bring troops or equipment to the island. In doing so, the United States continued to deny Japan access to a key island, though it meant operating from the territory being fought over. The denial of Japanese transports and cargo ships to Guadalcanal was a result of the United States operating directly from Henderson rather than a nearby base.[321]

Lessons for Today

The possibility of operating within a contested environment remains possible for the United States and thus warrants a return to World War II for any key insights. Many of the solutions that enabled the forces at Guadalcanal to generate combat power each day despite coming under heavy attack from the Japanese may apply to U.S. military today. Many of these lessons from Guadalcanal align with the findings of this study's main report.[322] For example, the analysis found that geography does matter and that operating closer to the fight may be needed for AB. Additionally, the research team identified the benefit of cross-training personnel to reduce the deployed footprint. We see this throughout Guadalcanal through the use of adaptable and versatile forces able to perform multiple roles. Further, the need to enhance effectiveness of the MAF through redundancy is critically important. The following points use the lessons from Guadalcanal and place them in a current context that will be useful to military planners and leaders.

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[318] Quoted in Frank, 1990, p. 214.

[319] Philippart, 2004, p. 8.

[320] Philippart, 2004, p. 17.

[321] Miller, 1995, p. 146.

[322] Orletsky, Brown, DeBlois, Mills, Norton, Brackup, et al., 2023.

Resourcefulness, adaptability, and versatility of planners, forces, and capabilities are essential to generating combat power in a contested environment. These elements encourage the development of contingency plans, improve efficiency, and acknowledge the need for creativity when operating in an unpredictable and chaotic environment. At Guadalcanal, the use of dedicated forces that could perform and fulfill multiple functions and missions was essential to operational success, given the operational environment. Pilots who could fly multiple aircraft for multiple types of missions, and who could perform some maintenance functions when needed, helped the United States to continue generating sorties when manpower was low and the base was under attack. Further, the ability of forces to be creative and resourceful, such as the Seabees for runway repair, was necessary to create quick solutions to operational issues. The Seabees did not have the proper tools but found ways to use makeshift tools or those left over to perform runway repair functions. Lastly, maintenance was difficult, yet personnel on Henderson remained adaptable and learned how to salvage damaged aircraft to keep other aircraft operational. In all, the forces on Henderson were resourceful, creative, and adaptive in finding solutions to issues with maintenance, supply, runway repair, and base defense.

The United States should use a joint approach and redundancy in functions and capabilities to avoid single points of failure. Employ redundant capabilities and personnel for all functions, as the enemy will defeat, delay, or thwart the first line of defense or effort at a particular function. Redundancy is especially important for supply and transport. The joint approach at Guadalcanal allowed for redundancy in transport, runway repair, maintenance, airfield security, and DCA, CAS, and interdiction. For each of these functions, a primary service and a secondary service (in some cases more than one) were able to fulfill and contribute to the mission. Redundancy was necessary at Henderson particularly for certain functions and missions. For supply, the enemy often blocked sea routes and caused the United States to quickly find ways to supply forces on Henderson through air routes as well. For other functions, such as maintenance and runway repair, the ability of units to also fulfill missions for which they were not necessarily trained or dedicated prevented any single points of failure emerging. The ability to prevent single points of failure meant that sorties could continue to generate despite heavy attacks that rendered personnel, supply routes, and aircraft unavailable.

Operation Matterhorn: A Case of Distributed Operations

As seen with the Guadalcanal case, Operation Matterhorn was a solution to operational conundrums and strategic imperatives facing the United States at the onset of the Pacific campaign during World War II. Matterhorn was a campaign designed to use crude, forward operating bases in China as staging bases to bomb Japan, as well as to use main operating bases in eastern India. In January 1943 President Franklin Roosevelt told Chiang Kai-shek, then leader of the People's Republic of China, that the United States would send forces to China in an effort to strike Japan. In doing so, Roosevelt set the stage for what would become Operation

Matterhorn, a distributed operation in the China-Burma-India theater. Conducting an operation from China to strike Japan was not an easy feat. It required much planning and creativity to devise a feasible operation. The key obstacles to operating from China involved the lack of a U.S. aircraft with the range to reach Japan from China and the inability to create main operating bases due to the heavy Japanese presence and threat. Additionally, the logistics of bringing supplies to bases in China soon became an operational nightmare.[323]

Operation Matterhorn occurred over a six- to seven-month period.[324] The first B-29 raid of Japan occurred in June 1944, and the XX Bomber Command, the striking force of the 20th Air Force, officially left the bases in China in January 1945. The sorties conducted over these months enabled the United States to start striking Japanese strategic targets six months earlier than it would have if it waited for the Mariana air bases to become operational.[325] Adding to the strategic imperative was Roosevelt's desire to prevent Japan from taking China. Roosevelt felt a need early on in World War II to back China, both by signaling support and by providing forces to keep Japan from overtaking it. Part of this effort involved eventually sending bombers and forces to China to strike Japan: Operation Matterhorn.[326] As a result, the operation provided some strategic benefit, although operationally and tactically it proved more cumbersome than helpful.

Background

Strategic Context

In 1943 and 1944 the United States knew that it had no viable options to strike Japan but had to find a means to begin inflicting damage on the main island. The United States lacked enough bombers with the range to reach Japan and did not have bases within range to strike from. During this time the Soviet Union refused the U.S. request to operate from Siberia, and the air bases in Mariana had not yet become available. With no available air bases within range to strike Japan, the United States looked to China. With approval from Britain to operate from bases in India and Roosevelt's statement to Chiang, operating from China seemed feasible. Further, the United States was looking to extend the role of strategic bombing—after experiencing success in the European theater—to the Pacific. In light of this, Roosevelt also had a strategic vision for China that included a strong U.S. presence.[327]

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[323] Craven and Cate, 1950, Chapter 2.

[324] According to Craven and Cate (1950), this was a ten-month operation.

[325] Daniel L. Haulman, *The U.S. Army Air Forces in World War II: Hitting Home; The Air Offensive Against Japan*, Washington, D.C.: Air Force History and Museums Program, 1999.

[326] E. R. Johnson, "Operation Matterhorn," *Aviation History*, July 2003.

[327] Herbert Feis, *China Tangle: The American Effort in China from Pearl Harbor to the Marshall Mission*, Princeton, N.J.: Princeton University Press, 1953, p. 2.

The original plan for the B-29 was to operate from U.S. territories to conduct long-range bombing; however, its first mission became that of Operation Matterhorn. A few factors contributed to this, including the suitability of B-17s and B-24s to the European theater and Roosevelt's effort to send bombers to China.[328] Although the largest bomber the United States had at that time, the B-29 was a complex system with a series of mechanical hiccups.[329] It could carry 5,000 pounds of bombs at an altitude of 30,000 feet at a speed of roughly 300 mph, but it frequently suffered from engine failures.[330] These factors contributed to difficulties the United States faced in accurately and effectively hitting Japanese targets when flying sorties from the Chinese bases.

The bases in China could function as main operating bases, which allowed for the use of distributed operations during Matterhorn. *Distributed operations* refers to the employment of combat aircraft from a number of geographically separated bases.[331] Since the Japanese controlled the major seaports and the strategic waterways and restricted the only land route into western China, the Burma Road, there were no viable options to supply a base.[332] With Japan cutting the Burma Road, the only way to supply operations to China was from a line of control that went from Calcutta, India, to Kunming, China. The last leg of this route could be performed only through air transport. In the China-Burma-India theater, the AAF's primary function was to protect airlift.[333]

In anticipation of the first B-29 raids on Japan during Matterhorn, the United States worked with British, Indian, and Chinese counterparts to construct suitable air bases in both India and China along the supply route. In India, the United States chose southern Bengal as the best area for rear area operations because of its proximity to China, security, access to Calcutta's port facilities, and communications within the rail and road systems. In China, Chengtu was chosen as the location for forward B-29 bases. Chengtu was situated 400 miles from Kunming, the end point for the supply route that begins at Calcutta.[334] This supply route has often been termed *over the hump*. Also, the Chengtu region provided suitable geography (i.e., level ground) and mild weather. The terrain was particularly important for B-29s, as they required runways that were built on a hard surface, were twice as thick as a normal runway, and were at least 8,000 feet

[328] Johnson, 2003.

[329] Johnson, 2003.

[330] Johnson, 2003.

[331] Miranda Priebe, Alan J. Vick, Jacob L. Heim, and Meagan L. Smith, *Distributed Operations in a Contested Environment: Implications for USAF Force Presentation*, Santa Monica, Calif.: RAND Corporation, RR-2959-AF, 2019, p. 1.

[332] John T. Correll, "The Matterhorn Missions," *Air Force Magazine*, March 2009.

[333] Craven and Cate, 1950, pp. 41–42.

[334] Craven and Cate, 1950, pp. 52, 65.

long.[335] Further, China provided the manpower needed to construct these forward bases in the Chengtu area.[336] For U.S. manpower, the XX Bomber Command, a subset of the 20th Air Force, was a critical component of Operation Matterhorn, providing a specialized force to conduct air operations from a crude forward base.

Due to the strategic imperative of striking Japan, the United States pursued a plan that required overcoming incredible logistical challenges a largely unprotected forward base, as well as developing a new capability. In doing so, this case of distributed operations provides some useful insights into enablers and factors that may contribute to either more-effective or more-efficient operations today. Before delving into the details of how U.S. forces conducted resupply, logistics, and aircraft functions, we first illustrate what a typical operation entailed to generate a sortie during Operation Matterhorn.

Basic Operation

A typical operation to strike Japan during Matterhorn consisted of three stages in which aircraft and personnel traveled from India to China and then back to India within a series of days.[337] To start, B-29s and their crews would fly from India to Chengtu, loaded with two tons of bombs per aircraft. This took roughly seven hours. Next, the crews would refuel the aircraft and then sleep at Chengtu in preparation for the next day's mission. The following morning the aircraft crews would fly across western China to Japan, launch their attacks, then return that same day to Chengtu. The crews would then spend that evening in Chengtu. The last stage involved the return flight to India the next day. As will be discussed below, the frequency of these missions depended on fuel availability in Chengtu. Getting fuel to Chengtu from India required a flight-intensive process.[338]

The subsequent sections explore these operations in greater detail and highlight several factors that made Operation Matterhorn particularly difficult and that ultimately contributed to the U.S. forces leaving the Chinese bases by January 1945.

How Enablers Determined Matterhorn's Fate

Resupply

Many decisionmakers at the time understood that Matterhorn was logistically unlikely to succeed, yet the strategic imperative urged senior leaders to move forward with the operation. Due to the terrain along the supply route, available aircraft, and crude conditions in the forward bases, resupply was a serious challenge in Operation Matterhorn. For Matterhorn, the XX

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[335] Feis, 1953.

[336] Craven and Cate, 1950, pp. 60–68.

[337] This discussion does not include the flights that occurred in advance of this mission to bring fuel to the staging base.

[338] Correll, 2009.

Bomber Command agreed to supply its own staging bases, using a combination of converted B-29s and C-87s. This proved particularly difficult, as Chengtu did not have any fuel, water, or land access to India. The only route available was that of the "hump route" in which aircraft must fly over the Himalayas. This was a treacherous and resource-intensive flight.[339]

Weather also plagued resupply efforts across the almost 12,000-mile supply route to Kunming. Heavy rains, high temperatures, and potential thunderstorms added a degree of danger and unpredictability to transport flights from Assam to Kunming.[340] With some of the highest mountains in the world, the Himalayan mountain range exacerbated the difficult weather conditions.[341] The combination of these factors ensured that no flight over the hump was without uncertainty.[342] As evidence, any flight, even if for transport, that went over the hump was deemed a combat mission.[343] Although estimates vary, it took roughly eight flights of tanker aircraft transporting fuel from India to China to generate one sortie from a B-29 out of Chengtu.[344] See Figure C.4 for the various routes over the hump.

[339] Craven and Cate, 1950, p. 54.

[340] Adrian Rainier Byers, *Air Supply Operations in the China-Burma-India Theater Between 1942 and 1945*, thesis, Fort Leavenworth, Kan.: U.S. Army Command and General Staff College, 2010, pp. 20–30.

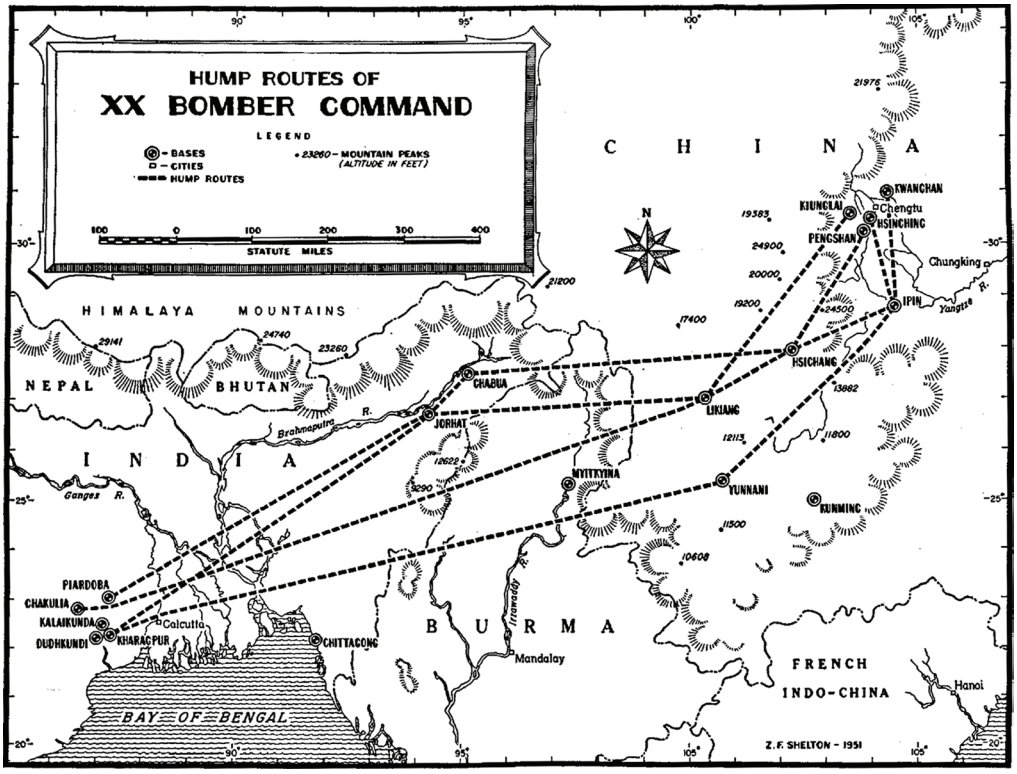
[341] Byers, 2010, pp. 20–30.

[342] Byers, 2010, pp. 20–30.

[343] Alex E. S. Green, Deborah S. Green, and Richard L. Francis, "OR Forum—a Glimpse at an Operation Analyst's World War II: 'Report on the Combat Performance of the Remote Control Turrets of B-29 Aircraft,'" *Operations Research*, Vol. 63, No. 2, March–April 2015, p. 263.

[344] John F. O'Connell, "What Might Have Been—XX Bomber Command's B-29 Offensive Against Japanese Oil Supplies in the Netherlands East Indies and Borneo," *Air Power History*, Vol. 64, No. 1, Spring 2017.

Figure C.4. Hump Routes



SOURCE: Wesley Frank Craven and James Lea Cate, eds., *The Army Air Forces in World War II*: Vol. V, *The Pacific: Matterhorn to Nagasaki, June 1944 to August 1995*, Washington, D.C.: Office of Air Force History, 1983.

The B-29s flew most of these routes to bring supplies to Kunming, and then Chengtu, as air transport control was tied up providing resupply to the 14th Air Force and Chiang's forces. With fuel and transport resources in short supply, the XX Bomber Command and available B-29s fulfilled the transport function. Many of the B-29s were converted into tankers to fly the necessary amount of fuel to Chengtu to conduct a single sortie.[345] A combat-ready B-29 could support roughly three tons of fuel. However, when the crew stripped a B-29 of all combat equipment, excluding radar and some guns, it could hold seven tons.[346]

Unfortunately, the XX Bomber Command could not successfully perform its own transport functions and in time turned to air transport control for support. The XX Bomber Command lacked sufficient aircraft dedicated to air transport functions, so it used the superfortress B-29 bombers to ferry fuel, munitions, spare parts, and so on from the United States to India and then to Chengtu. Throughout the months leading up to operations during Matterhorn, and during the operation itself, senior U.S. military leadership could not reach consensus on how to provide the needed transport resources, both in terms of personnel and aircraft, to perform the transport

[345] Correll, 2009.

[346] Correll, 2009.

functions for Matterhorn.[347] By the time bases in the Marianas became operational and the United States could reach Japan from another base, the logistics of Matterhorn were no longer necessary or desired.

These logistics and resupply obstacles limited the effectiveness of Operation Matterhorn because the XX Bomber Command could, even at its peak, generate only roughly two sorties per aircraft for each month. Of these sorties, only 50 percent were flown to strike Japan. As a result, the logistics involved to keep Matterhorn afloat were expensive, time-consuming, and resource intensive.[348]

Aircraft Performance

Aircraft performance issues contributed to operational challenges during Matterhorn, as the B-29s frequently experienced engine issues that prevented them from accurately hitting their targets in Japan. Politics affected the impetus for getting the B-29 operational very quickly, which affected the overall performance of the aircraft. Roosevelt placed much pressure on General "Hap" Arnold, the Chief of the AAF, to get the B-29 operational. When Arnold established that the B-29s would be used for strategic bombing against Japan, he insisted that the aircraft be operational by the spring of 1944. During this time, deliveries had fallen behind, hundreds of modifications were being made to the aircraft before and after initial testing, and there were not enough B-29s available to support the operations Arnold envisioned. As a result, Arnold was displeased and expressed his anger, causing the B-29s to eventually be sent to the China-Burma-India theater.[349]

By May 1944 there were 160 B-29s in India.[350] However, this was not necessarily a perfect solution. The Wright Cyclone R-3350 engine had a tendency to overheat and catch fire. The air-cooling system within the engine would swallow valves.[351] When the valve burned, it destroyed the cylinders, which could fly off and damage the engine.[352] Further, due to the logistics issues discussed above, the B-29s often flew with more weight than they were designed to in order to bring fuel over the hump. Additionally, because the B-29 went into production before going through rigorous flight tests, these technical issues were not completely unexpected. Boeing, the company that developed the B-29, was developing fixes to these issues in real time and would

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[347] Craven and Cate, 1950, pp. 82–86.

[348] G. Scott Gorman, *Endgame in the Pacific: Complexity, Strategy, and the B-29*, Maxwell, Ala.: Air University Press, 2000, p. 22.

[349] Correll, 2009.

[350] Correll, 2009.

[351] Correll, 2009.

[352] Correll, 2009.

send engineers into the field to deliver the kits to modify the aircraft.[353] The first B-29 mission against Japan evidences some of these performance challenges.

On June 15, 68 B-29s left Chengtu for Yawata, aiming to bomb an iron and steel site. The aircraft were carrying two tons of bombs and had refueled enough to travel the 3,200-mile roundtrip flight from Chengtu to Japan.[354] During the operation, two B-29s crashed, ten suffered mechanical issues, nine diverted to other targets, and 47 reached the target but experienced cloud coverage.[355] Of the 47 that reached the target, there was only one direct hit.[356] This mission was not an outlier—the success of the missions during Matterhorn proved underwhelming—but demonstrates the strategic impact through the psychological damage inflicted through these attacks.[357]

Although many other factors contributed to the successes and failures of Operation Matterhorn, the primary elements were the challenges experienced with resupply and aircraft performance. Other factors included airfield security from Japanese ground attack, maintenance functions, and aircraft availability. We do not discuss those elements in this case, though they are important to remember in terms of the overall operation. The next section uses the insights from Operation Matterhorn to draw implications for today.

Lessons for Today

The key takeaways that emerge from Operation Matterhorn include the role and importance of prepositioned supplies, redundancy in supply routes, balancing strategic impetus with practical decisionmaking, and the necessity of having enough capabilities to perform a mission. Similar to the lessons from Guadalcanal, these findings mirror those found in the broader analysis conducted during this study. Specifically, the quantitative analysis presented in the study's main report found several enhancements to support AB for the MAF, such as the prepositioning of supplies, mechanisms to reduce the deployed footprint, and lessons about how to incorporate new systems and CONOPs to improve overall operations. The following presents the lessons from Operation Matterhorn in greater detail.

Distributed operations that lack prepositioned supply and that hinder resupply can render the operation both ineffective and inefficient. Because Japan controlled the major seaports and the strategic waterways and restricted the only land route into western China, the Burma Road, the only way to supply operations to China was from a line of control that went from Calcutta, India, to Kunming, China. This supply route was wrought with logistics

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[353] Curtis LeMay and Bill Yenne, *Superfortress: The Boeing B-29 and American Airpower in World War II*, Yardley, Pa.: Westholme Publishing, 1988, pp. 80–86.

[354] Correll, 2009.

[355] Correll, 2009.

[356] Correll, 2009.

[357] LeMay and Yenne, 1988, pp. 80–86.

challenges (weather, range, etc.) that increased the overall cost, decreased the overall effectiveness of the operation, and prevented the prepositioning of supplies needed to generate sorties. Logistics difficulties reduced the number of sorties that could be generated from Chengtu to Japan, hampered their quality, and decreased the availability of aircraft. Because there were no prepositioned supplies in China, the B-29s had to spend weeks transporting enough fuel to fly a single sortie. The lack of prepositioned supplies significantly limited the success of the distributed operation. Additionally, there was no redundancy baked into the planning process. Because there was a single supply route from India to Kunming, the forces were limited by weather conditions and available aircraft, as air transport was the only means to reach Kunming on the last leg of the supply route. Ensuring that fuel and other supplies are prepositioned in the forward base location and have some degree of redundancy for resupply will help ensure that sorties can be generated on a more regular basis.

Decisionmaking under operational imperatives should account for the trade-off between speed and quality. Due to the strategic imperative of using strategic bombing against Japan, senior leadership opted to expedite the production process of the B-29 without accounting for some of the technical issues that ensued as a consequence. Balancing some of the strategic imperative with potential unintended consequences may improve the outcome of an operation.

USAF can attack territory in the east from the west using distributed operations. Operation Matterhorn demonstrated that, though costly and at times inefficient, the United States can develop routes to attack territories in the east from the west through a distributed operations AB context. The United States was able to repurpose the B-29 into transport aircraft, use main operating bases in India, and create a forward, crude base to eventually launch the sorties to attack Japan. In today's context, if the United States were unable to utilize bases in Japan, Guam, or other territories, it could potentially use Diego Garcia, for example, as another option to target an adversary in the Pacific theater.

Abbreviations

AAF	Army Air Forces
AB	adaptive basing
CAF	combat air forces
CAS	close air support
CCP	Chinese Communist Party
DCA	defensive counterair
CONOP	concept of operations
FARP	forward area refueling point
MAF	Mobility Air Forces
NATO	North Atlantic Treaty Organization
PACAF	Pacific Air Forces
PLA	People's Liberation Army
SOFA	Status of Forces Agreement
THAAD	Terminal High Altitude Air Defense
USAF	U.S. Air Force
USAFE	U.S. Air Forces in Europe

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PROJECT AIR FORCE

The U.S. Air Force is exploring adaptive basing (AB) concepts to reduce the vulnerability of U.S. forces to growing air and missile threats and to preserve critical combat capabilities in highly contested environments. These concepts are likely to stress the U.S. Air Force's global mobility capabilities. AB concepts call for force packages to operate in mobile and responsive ways to preserve critical combat capabilities and fight from positions of advantage. Although these concepts place additional and different demands on the U.S. Air Force's global mobility capabilities, their effect on the Mobility Air Forces had not been fully analyzed.

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