

Research Project:

Bombing with Boundaries: Target Selection in North Vietnam and Laos, 1964-1968

By Phillip R. Pratzner, Jr.

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I. Introduction

During Operation Rolling Thunder, from spring 1965 to late 1968¹, the United States delivered 643,000 tons of aerial bombs in North Vietnam, more than the total tonnage dropped by Allied Forces in the entire Pacific Campaign during World War II.² Yet the Johnson Administration considered Rolling Thunder, along with the bombing of both Laos and South Vietnam, a failure in both raising the cost of North Vietnamese support, and in blocking the logistical supply flowing to the Viet Cong. Humbled by this perceived reality and reeling from the Tet Offensive in early spring 1968, the United States sought to negotiate an end to the war in late 1968. Given the number of bombs dropped against this agrarian foe, target selection (or target development)³ emerges as a potential causation in explaining the military failure. Foremost, how did targeting officers select targets for aerial bombing? What targets did they nominate for higher authority strike approval?⁴ Why were these efforts perceived as ineffective? These questions shape the basis for this research paper and reveal the core challenge of boundaries.

From 1964-1968, boundaries defined how U.S. targeting officers selected targets in North Vietnam and Laos. These boundaries were either imposed by others or confined by their own making. For the former cases, civilian superiors in Washington, and in the theater of operations, imposed

¹ Earl Tilford, *Setup: What the Air Force Did in Vietnam and Why* (Maxwell Air Force Base, AL: Air University Press, 1991): 153. Tilford points out that Rolling Thunder officially continued until April 1972. However, President Johnson ended it in large part on October 31, 1968. This paper uses this end date, routinely used by other scholars.

² Carl Berger, *The United States Air Force in Southeast Asia: 1961-1973: An Illustrated Account* (Washington, D.C.: U.S. Government Printing Office, 1984), 89 and 368.

³ Department of Defense [DOD], *DOD Dictionary of Military and Associated Terms* (September 2018), Accessed on November 5, 2018, <http://www.jcs.mil/Portals/36/Documents/Doctrine/pubs/dictionary.pdf>, 227. This dictionary defines target development, used interchangeably in this paper with target selection, as “The systematic examination of potential target systems - and their components, individual targets, and even elements of targets - to determine the necessary type and duration of the action that must be exerted on each target to create an effect that is consistent with the commander’s specific objectives.”

⁴ Targeting officers both selected and nominated targets. They possessed authorities to select some targets, such as military forces, roads and bridges which were on or close to the battlefield. In other cases, for targets of a strategic nature, such as a port or national level command post, they nominated targets which eventually went to the White House for strike approval. This paper employs the term “target selection” as the default description for either selection or nomination. However, when appropriate, it differentiates between selection and nomination to accurately describe the role of the targeting officer in a specific instance.

bombing restrictions in Hanoi, in Haiphong, and even in the jungles of Laos. In the later cases, their own worldview and experiences bounded their imagination to select targets aligned to the type of war they were fighting. Operating in a complex environment from various locations and commands, their integration was sporadic and authority to strike proposed select targets vacillated between the Presidential and Secretary of Defense level, to local wing commanders deployed in-country.

In examining target selection in Southeast Asia, scholars in the 1980s and 1990s gravitated towards two opposing narratives, one assessing military failure and the other asserting failure from Washington. Mark Clodfelter in *The Limits of Air Power: The American Bombing of North Vietnam* and Earl Tilford in *Setup: What the Air Force Did in Vietnam and Why*, developed claims centered on Air Force failures. In their view, the Air Force's obsolescent doctrine drove it to view Vietnam through a modern industrial state lens, which it was not. In contrast, Jacob Van Staaveren in *Interdiction in Southern Laos: 1960-1968*, H.R. McMaster in *Dereliction of Duty*, and Charles Kamps' 2001 article in *Aerospace Power Journal* entitled "The JCS 94-Target List: A Vietnam Myth That Still Distorts Military Thought," assert that senior civilian defense officials in Washington, chiefly President Lyndon Johnson and Secretary of Defense Robert McNamara, developed a strategy of graduated pressure, inadequately informed by military judgment. Micromanaged from Washington, they contend this strategy unnecessarily risked American lives for unachievable objectives, prevented attack against enemy targets of value, and restricted airpower from reaching its full potential.

A more balanced narrative emerged from three scholars in the 2000s. Bernard Nalty in *The War Against Trucks: Aerial Interdiction in Southern Laos, 1968-1972*, and two PhD dissertations, Bill Andrews' "To Fly and Fight: The Experience of American Airman in Southeast Asia," and Paul Berg's "Assessing U.S. Air Force Bombing Effectiveness During Rolling Thunder," provide evidence of failures from both Washington and the military. At the same time, these authors exposed successes in specific targeting examples. Further, they revealed stories of several targeting officers central to this research paper.

Notwithstanding these narratives, the scholars from the previous decades, such as Clodfelter, Tilford, and McMaster, addressed target selection issues principally at the strategic level, centered on the Joint Chiefs of Staff and senior field commanders. They give less agency to the targeting officers (primarily Colonels and Lieutenant Colonels) intimately involved the target selection, and more agency to the senior field commanders (primarily Generals and Admirals) who engaged with civilian leaders. These targeting officers are mentioned briefly in the main text, but are more likely addressed in footnotes and bibliographies. Nalty, Andrews, and Berg provide agency to some of these targeting officers, but do not extensively cover “how” they applied their tradecraft. Moreover, these individuals are not the primary actors in their narratives.

This research paper thus seeks a more complete understanding of how target selection was conducted from the perspective of targeting officers engaged in combat. It contends they achieved both successes and failures within their bounded environment. It analyzes how they used the inputs available to them, employed tools and technologies in a throughput process, and presented outputs of targeting strategies and target lists. These targeting officers served in one of three places: in-country, including Thailand, South Vietnam, or in the South China Sea; in Hawaii, at Pacific Command (PACOM) or one of its components, such as Pacific Air Force (PACAF); or at the Joint Chiefs of Staff (JCS) in Washington, D.C. From these locations and commands, targeting officers adapted to their unique situations and attempted to provide viable targeting options designed to meet campaign objectives. They developed customized procedures, conducted fused analysis, and took full advantage of the authorities they possessed as they participated in multiple operations in North Vietnam (Rolling Thunder) and Laos.⁵

Using this methodology, this research paper offers a more nuanced understanding of target selection, and sheds new light on Southeast Asia target selection from 1964-1968, in the crucial early

⁵ Operations in Laos included: Barrell Roll (Northeast Laos, 14 December 1964 – 29 March 1973), Steel Tiger (Southeast Laos, 3 April 1965 – 11 November 1968), and Tiger Hound (Southeast Laos, 5 December 1965 – 11 November 1968).

years of the air war. To accomplish this, secondary sources, some mentioned above, served as a guide to investigate relevant primary sources. Primary source materials most notably included personal interviews, memoirs, and correspondence, as well as reports, memorandums, messages, and briefings. The Air Force Historical Research Agency (AFHRA) at Maxwell Air Force Base, Alabama, possessed many of these sources in its archives. From these sources, a narrative evolved of target selection beyond the traditional description of target selection done at the White House. A full analysis of how targeting officers selected targets necessarily begins with examining their identity and roles.

II. Target Selection Analysis

The Targeting Officers and Their Roles

The targeting officers responsible for target selection in Vietnam and Laos from 1964-1968 represented three geographic and command levels. First, in-country targeting officers hailed principally from the 2d Air Division (until April 1966), Seventh Air Force (after April 1966)⁶, or Carrier Task Force (CTF)-77. Representative of this group were Air Force Major James C. Enney, who led the Target Intelligence Center (TIC) in the 2d Air Division from April 1965-April 1966; Air Force Lieutenant Colonel Thomas Greenhalgh, the Deputy Director of Targets at Seventh Air Force from August 1966-August 1967; and Air Force Colonel Howard Smith, the Director of Targets at Seventh Air Force in June 1967-June 1968. Second, theater targeting officers served in PACOM, or one of its components, such as PACAF. Colonel Pat Goforth served in this capacity as PACAF's Director of Targets from 1966-1968. Third, at the national level, Air Force Colonel Henry Edelen performed targeting duties at the Joint Chiefs of Staff (JCS) in the Pentagon from May 1965-1970.⁷

⁶ 2d Air Division was redesignated Seventh Air Force on April 1, 1966.

⁷ DOD, 226, 173, and 219. Targeting officers operated at three levels of warfare: tactical, operational, and strategic. Tactical is described as "The level of warfare at which battles and engagements are planned and executed to achieve military objectives assigned to tactical units or task forces." (226) Operational is defined as "The level of warfare at which campaigns and major operations are planned, conducted, and sustained to achieve strategic objectives within theaters or other operational areas." (173) Strategic is characterized as "The level of warfare at which a nation, often as a member of a group of nations, determines national or multinational (alliance or

At the in-country level, interdiction⁸ was predominant. Major Enney built an organization which fused photo reconnaissance and target development, along with accompanying procedures, to support armed reconnaissance (Armed Recce) missions focused on interdiction.⁹ One of his most confounding challenges was administrative in nature but had operational impact: although he lacked a computer, Enney avoided double counting armed recce targets by creating a unique Armed Recce Target System (ARTS).¹⁰ This reduced repeat missions into the same target area; further, it enabled more accurate combat reporting. Enney also stridently attempted to improve aircrews' ability to prosecute interdiction targets by standardizing target materials, maintaining continuous liaisons with flying units, and utilizing intelligence gained by aircrew debriefs.¹¹ Enney did not consider himself an innovator; rather, a problem solver employing a "fly and miss" industrial-like approach.¹² For example, the TIC made few attempts to fuse human, imagery, and signals intelligence; each was largely left to its own stovepipe.¹³

Lieutenant Colonel Greenhalgh, who served in Seventh Air Force from August 1966 to August 1967, also focused on interdiction. In his year as the Deputy Director of Targets, Greenhalgh helped create a Central Target Folder Library of 3,500 targets, always kept current with complete coverage of North Vietnam. The library provided commanders or staff members any folder on demand, and the folders contained results from OPREP-4s (aircrew debriefing report)¹⁴, Photo Interpreter (PI) reports,

coalition) strategic security objectives and guidance, then develops and uses national resources to achieve those objectives. (219) In-country targeting officers primarily focused on the tactical level, secondarily at the operational level; in Hawaii, PACOM and PACAF targeting officers primarily focused on the operational level, with a secondary focus on the tactical and strategic levels; last, the JCS targeting officers operated at the strategic level primarily, and the operational level secondarily.

⁸ DOD, 118, defines interdiction as "An action to divert, disrupt, delay, or destroy the enemy's military surface capability before it can be used effectively against friendly forces, or to achieve enemy objectives."

⁹ Lieutenant Colonel James Enney, Interview by Captain Robert Snakenberg, 4 November 1969, Air Force Historical Research Agency File number K239.0512-310, 3.

¹⁰ Enney, 17.

¹¹ Enney, 12, 19.

¹² Enney, 6.

¹³ Enney, 17, and Paul Berg, "Assessing U.S. Air Force Bombing Effectiveness During Rolling Thunder," PhD diss., Auburn University, 2001, Accessed October 24, 2018, <http://www.dtic.mil/dtic/tr/fulltext/u2/a399425.pdf>, 161.

¹⁴ Berg, 47-48. The OPREP-4 served as the operational report which captured aircrew mission data, and then were transmitted to headquarters via secure electronic network. The data elements included mission number, target

and showed when each target had been fragged,¹⁵ struck, and observed by reconnaissance.¹⁶

Greenhalgh struggled to gain accurate Battle Damage Assessment (BDA), particularly against bridges and railroad targets, both of which were difficult for aircrews to assess by visual cues. Tactical reconnaissance (Tac Recce) reduced this uncertainty if it could image the target shortly after a strike. An adaptation practiced by Greenhalgh, this BDA was timely and accurate; like Enney's ARTS numbering system, it more efficiently used air power, gained a more precise enemy picture, and put fewer aircrews at risk. Yet, this did not alleviate Greenhalgh's frustrations with strike authorizations, which seemed arbitrary, and guided primarily by restrictions and prohibitions rather than military objectives.¹⁷

Colonel Smith guided Seventh Air Force as the Director of Targets from June 1967- June 1968. Like Greenhalgh, he was frustrated by target selection, including Military Assistance Command Vietnam's (MACV) fixation on targeting the battlefield, and the onerous, time consuming coordination required to coordinate strikes with the U.S. Ambassador to Laos.¹⁸ He adapted to these challenges principally by building a strong case for attacking alternative targets, as far away as possible from the battlefield. In one specific instance, he helped persuade General Westmoreland, the MACV Commander, to conduct interdiction in southern Laos instead of attacking targets in South Vietnam.¹⁹ This required partnering with Task Force Alpha (TF-Alpha), an organization at Nakhon Phanom Air Base in Thailand set up to run a recce-strike fusion center and discussed later.²⁰ Smith's efforts paid off, as Operation

location, numbers and types of aircraft, ordnance expended, weather encountered, aircraft damaged or lost, and remarks about bombing results.

¹⁵ "Fragged" is an operational term which meant a target was selected for attack and an aircraft was assigned to it.

¹⁶ Berg, 138.

¹⁷ Berg, 152 and Mark Clodfelter, *The Limits of Air Power: The American Bombing of North Vietnam* (Lincoln: University of Nebraska Press, 2006), 122-123.

¹⁸ Bernard Nalty, *The War against Trucks: Aerial Interdiction in Southern Laos, 1968-1972* (U.S. Government Printing Office: Washington, D.C., 2005), 37-38.

¹⁹ Nalty, 37.

²⁰ Seymour Deitchman, "The "Electronic Battlefield" in the Vietnam War," *The Journal of Military History* 72 (July 2008): 876.

Turnpike, from April 19 to June 24, 1968 during the Tet Offensive, employed B-52 and other tactical aircraft to reduce North Vietnamese resupply and divert it to less optimal routes in Southern Laos.²¹

At PACAF, Colonel Goforth focused on interdiction and BDA as well, but from a broader perspective which incorporated systems level approach. Instead of daily reports employed by Seventh Air Force, Goforth analyzed trends on a weekly basis, which he felt achieved a more “comprehensive synthesis” of Lines of Communication (LOC) analysis.²² While having the same fusion challenges which vexed in-country organizations, Goforth provided his photo interpreters (PIs) access to human intelligence (HUMINT) and even “special intelligence” (highly-secret communications intercepts).²³ Goforth believed the best target development and BDA resulted when analysts understood the campaign’s objectives and had access to information from multiple sources of intelligence.²⁴ PACAF’s LOC and BDA activities informed its CHECO (Contemporary Historical Evaluation of Counterinsurgency Operations) reports, which were high level assessments of air operations in Southeast Asia. CHECO reports summarized bombing mission results by evaluating 14 categories or target sets.²⁵ Through this analysis, PACAF provided targeting options for their parent headquarters, PACOM.

To form its targeting strategies and options, PACOM targeting officers integrated multiple products and perspectives: PACAF CHECO reports, PACOM components (primarily PACAF and Pacific Fleet (PACFLT)) estimates and recommended targets, target lists from in-country organizations (MACV, Seventh Air Force, and CTF-77) and finally, intelligence analysis from the Central Intelligence Agency (CIA) and Defense Intelligence Agency (DIA).²⁶ Admiral Grant Sharp, who served as Commander-in-Chief

²¹ Nalty, 38.

²² Berg, 160.

²³ Berg, 161.

²⁴ Berg, 161.

²⁵ Berg, 165. Target sets were: Anti-aircraft artillery (AAA) sites, Surface-to-Air (SAM) sites, communication sites, military areas, Petroleum, Oil and Lubricants (POL), staging/supply, buildings, LOCs, ports, power plants, railroad yards, motor vehicles, railroad vehicles, and water vehicles.

²⁶ Berg, 175, Tilford, 109 and U.S. Grant Sharp, *Strategy for Defeat: Vietnam in Retrospect* (San Rafael, CA: Presidio Press, 1978), 86.

Pacific Command (CINCPAC) from June 1964-July 1968, continually emphasized the need to attack critical, strategic targets in Hanoi and Haiphong. PACOM's quarterly *Rolling Thunder Digest*, which pulled in CHECO data and was often consistent with its views, reflected CINCPAC's view of the war.

While Enney, Greenhalgh, Smith, and Goforth focused on tasks such as target folder production, BDA, and target strategy development, Colonel Edelen, at the JCS, focused on getting target nomination approval from civilian defense leaders from May 1965 through the end of 1968 as part of the Chairman, JCS (CJCS) Rolling Thunder Team. Working at the strategic level, Edelen took PACOM's targeting strategies and lists, informed by national agency inputs (such as the Defense Intelligence Agency), and helped to prepare target nomination lists for the CJCS, Gen Earle Wheeler. In turn, Wheeler presented these lists for approval to the Secretary of Defense and President.²⁷

In conducting his duties, Edelen would be exposed nearly continuously to an approach described as "gradualism," which sought to impose an ever greater amount of consequences to North Vietnam as bombing operations slowly moved northward towards the Northeast quadrant, which contained Hanoi and Haiphong.²⁸ Bombing in this quadrant, which CINCPAC wholly supported, were severely restricted for most of the 1964-1968 period; Hanoi contained a thirty-mile radius restricted area, while Haiphong had a ten-mile radius restricted area.²⁹ Edelen adapted, like the other targeting officers, to this reality by relentlessly proposing to extend the Armed Recce line northward, requesting increased sorties at opportune times, and using what targeting approvals they did have to maximum effect.³⁰

Although developed before he arrived at the JCS, Edelen's efforts over three years were shaped by one of the seminal targeting products of the Vietnam War, the JCS 94-target list. This list contained 82 fixed targets and 12 armed recce targets. Developed by a Joint Working Group, the JCS presented it

²⁷ Henry Edelen, Interview by Lieutenant Colonel S. Bissell and Major Samuel Riddlebarger, January 27, 1970, Air Force Historical Research Agency File number K239.0512-243, 16.

²⁸ Edelen, 42.

²⁹ Sharp, 99-101 and Edelen, 87.

³⁰ Edelen, 32, 39, 61.

to the Secretary of Defense on August 24, 1964.³¹ The list contained five broad categories: LOC nodes (12 targets, including nine bridges and three rail yards); airfields (nine); military installations and ports (53 in total, including 28 barracks/supply depots, nine ammunition depots, seven port facilities, four Petroleum, Oil, and Lubricants (POL) installations, two communications nodes, two headquarters, and one Surface-to-Air Missile (SAM) support facility); industrial plants (eight); and the aforementioned 12 reconnaissance routes.³² It reflected the substantial contribution of national intelligence; indeed, a CIA target study submitted in June 1965 identified nearly the same set of targets of consequence: “The neutralization of key industrial, transport and military targets could constitute a serious blow to the Hanoi regime and adversely affect its determination to carry on the present conflict...”³³

At various times and under certain situations throughout this period, military leaders would invoke the list or at least its underlying intent. It promised, they argued, to deliver a “sharp blow”³⁴ and potentially change the strategic calculus of North Vietnam. Chief of Staff of the Air Force John McConnell argued for this in March 1965, Seventh Air Force Commander Lieutenant General Momyer advocated for it in 1967 to the Stennis Committee, and CINCPAC Admiral Sharp repeatedly contended the necessity for the “sharp blow” even as late as 1968 in a message to the JCS.³⁵ Edelen subscribed to this view throughout his time at the Joint Staff. His targeting advocacy did not, however, persuade the Secretary of Defense to a course of action consistent with a “sharp blow;” rather, civilian defense leaders would remain committed to gradualism through 1968.³⁶

³¹ Joint Chiefs of Staff, *Target Study—North Vietnam*, Working papers, 1964-1967, Air Force Historical Research Agency File number K178.2-34, and Charles Kamps, “The JCS 94-Target List: A Vietnam Myth That Still Distorts Military Thought,” *Aerospace Power Journal* (Spring 2001), 73.

³² Joint Chiefs of Staff and Kamps, 73-76.

³³ Central Intelligence Agency, Office of Research and Reports, *Target Study of North Vietnam*, June 11, 1965, Accessed September 22, 2018, <https://ia600603.us.archive.org/17/items/CIA-RDP78S02149R000100340026-5/CIA-RDP78S02149R000100340026-5.pdf>, 2.

³⁴ Edelen, 8.

³⁵ Sharp, 69, 301-304, and Berg, 247-249.

³⁶ McMaster, 286. In a revealing exemplar, the JCS recommended fourteen targets for the Rolling Thunder Program 20 (RT-20) in June 1965. McNamara, in consultation with the State Department and other civilian advisors,

Despite the challenges of getting some target approvals, Enney, Greenhalgh, Smith, Goforth, and Edelen obtained approval for other fixed targets in North Vietnam. These fixed targets, such as the Thanh Hoa Bridge, required a time-consuming process to attain a JCS target number. First, using intelligence gained either by an intelligence source, normally photo reconnaissance, or a combination of sources, targeting officers at Seventh Air Force and CTF-77 identified a potential target with basic identifying information, such as a simple functional description and geographical location. These targets, approved by their commander, were then forwarded to PACOM, which combined in-country target lists with targets developed at both PACOM and its components (PACAF and PACFLT). PACOM then coordinated these targets through their staff and sorted them into one of six categories: electricity, war industries, transportation, military complexes, POL, and air defense.

Upon CINCPAC approval, the target list was sent to the JCS staff, where military and civilian analysts assessed it, added in their own targets as needed and deleted others they deemed ill-suited for further coordination. Colonel Edelen performed such a role. For example, he removed a power facility off one Rolling Thunder iteration, given that it only produced local power to some mines and did not have a military purpose.³⁷ After sharing this culled list with other government agencies, such as the State Department, the list was sent to the Joint Chiefs for their approval. Finally, it was sent to the White House, where it underwent its final review for approval at a Tuesday luncheon hosted by the President and attended by the Secretary of Defense and other senior cabinet officials.³⁸ If it had not already happened at this point, the official target number, termed a Basic Encyclopedia (BE) number, was converted from an interim number to a permanent identification.³⁹ These fixed targets, submitted from

removed seven targets and briefed the President on this plan. With no military officer present, the plan was approved, and Wheeler sent the final orders to CINCPAC.

³⁷ Edelen, 82.

³⁸ Tilford, 108-109 and Berg, 223.

³⁹ Enney, 18.

the JCS for final Presidential approval, composed what would eventually become the Rolling Thunder Target List (RTTL). The RTTL grew from the 94 originally conceived in 1964 to 465 by October 1965.⁴⁰

In contrast to the complicated and unwieldy process for fixed targets, mobile targets incorporated a far more streamlined procedure. Mobile targets were nearly exclusively developed by in-country organizations, such as Seventh Air Force. These unnumbered targets would include fleeting targets like trucks and boats. The ease of mobile target development and approval, as compared to fixed targets, directly drove the preponderance of actual strikes, some 75 percent, to these target types.⁴¹ The investigation of a mobile target along a predesignated Armed Recce route (which might be a fixed, numbered target) by a fighter or reconnaissance aircraft often led to the discovery of a truck park or small facility (such as a vehicle or maintenance shed) assessed to have a military purpose. These “fixed” targets, often requiring immediate action before they were vacated, would normally be given an in-country designator, such as Enney’s ARTS numbering system mentioned above.⁴² In the prosecution of these fixed targets, aircrews would often detect vehicles nearby, which prompted attack against them.⁴³ Through this technique, along with standard Armed Recce missions, U.S. aircraft destroyed or damaged 6,578 vehicles and 7,584 structures in Laos from December 1964 – December 1967.⁴⁴

Whether fixed or mobile, the targeting officers in-country, at PACOM, or at the JCS, developed targeting options in support of the three basic targeting lines of effort, which were congruent with the ostensible objectives of Rolling Thunder.⁴⁵ The first line of effort was strategic persuasion. This aligned

⁴⁰ Headquarters PACAF, *Project CHECO Report: Rolling Thunder*, January 1967 – November 1968, Accessed September 25, 2018, <http://www.dtic.mil/dtic/tr/fulltext/u2/a486572.pdf>, 21.

⁴¹ Tilford, 108.

⁴² Enney, 17.

⁴³ Enney, 1.

⁴⁴ Jacob Van Staaveren, *Interdiction in Southern Laos: 1960-1968* (Washington, D.C.: U.S. Government Printing Office, 1993), 298.

⁴⁵ The objectives of Rolling Thunder were unclear and the source of considerable debate, both during the Vietnam War between senior civilian officials and senior military commanders, and after amongst scholars. Several scholars have highlighted this point, and this paper needs not add to the discussion provided in Clodfelter (75-76), Tilford (105) and McMaster (227-236). Due to their clarity and accuracy, this paper utilizes the objectives identified in Tilford (105) and the Edelen Interview (113) as the best description of Rolling Thunder objectives. Significantly,

to the Rolling Thunder objective “to force the government of NVM [North Vietnam] to cease their support of the insurgency of South Vietnam...”⁴⁶ by making “aggression more costly...”⁴⁷ The second line of effort focused on interdicting supplies flowing from North Vietnam to South Vietnam, and aligned to the Rolling Thunder objective of interdicting LOCs. Third and last, officers targeted North Vietnam’s strategy against South Vietnam. This strategy, Mao-inspired and designed along the lines of a People’s War, was not fully appreciated and understood by U.S. targeting officers at the time. Yet, the Rolling Thunder objective of raising the morale of South Vietnam indirectly addressed the North Vietnamese strategy. The three targeting lines of effort were not mutually exclusive and were even reinforcing in certain circumstances. To assess how targeting officers addressed these lines of effort, this paper now turns to an analytical framework which examines inputs, throughput, and outputs.

Targeting for Strategic Persuasion

Before the Gulf of Tonkin incident in August 1964, Air Force leaders carried a worldview which informed the JCS 94-target list delivered later that month. General Curtis LeMay, who was Chief of Staff of the Air Force at the time and the target list’s primary advocate, drew fundamental conclusions from his experiences in World War II that strategic airpower was decisive, and viewed the Korean War as an aberration.⁴⁸ Derived from deterrence theory, he and other senior air leaders argued that airpower could deliver a level of pain that would coerce (or persuade) Hanoi into abandoning its support of the southern insurgency.⁴⁹ Targeting officers largely embraced this perspective as well, yet where they sat strongly informed their advocacy. Colonel Edelen from the JCS was singularly distinctive in this role, with PACOM targets officers playing a strong supporting role. Edelen embraced the “sharp blow” concept,

Edelen identifies two very similar objectives: “make aggression more costly to North Vietnam...” and “reduce North Vietnam’s capability and will to continue the aggression.” This paper combines these ideas into the single targeting line of effort, strategic persuasion.

⁴⁶ Joint Chiefs of Staff, “Project Harvest,” 4.

⁴⁷ Edelen, 113.

⁴⁸ Clodfelter, xiv.

⁴⁹ Tilford, 105.

going after the targets of greatest import to North Vietnam, without respite. Gradualism, he contended, was “...not the way to conduct an air campaign...” He surmised that North Vietnam depended “...entirely on imports for a good portion of the necessities of life and entirely on imports for the means of waging war.”⁵⁰ In his view, this created a vulnerability which could be exploited.

To arrive at this conclusion, Edelen received several inputs which drove the targeting options he developed. These inputs included intelligence from the national agencies (primarily DIA, and secondarily CIA), PACOM targeting options, and finally, civilian leader guidance which included bombing restrictions. Foremost, intelligence assessments underpinned his targeting strategy. DIA, Edelen asserted, could use their all-source analytical fusion skill sets to “...put all the pieces together from the various segments of the intelligence community.”⁵¹ The CIA also provided assessments, which contained less purely military “order of battle” information⁵², and more political, social, and economic information. For example, the CIA’s Office of Research and Reports authored a Target Study in June 1965. It included a discussion of not only North Vietnam’s military capabilities, but also its rice crop vulnerability to flooding.⁵³

Although Edelen had the primary targeting role for strategic persuasion, PACOM served as a critical partner because of their theater wide scope and Admiral Sharp’s own biases towards a “sharp blow” against North Vietnam. Through Admiral Sharp’s many messages, proposed target lists, and reports, PACOM shared the responsibility for strategic persuasion targeting. In a 26 October 1966 Message to the JCS, Sharp asserted it was “... becoming critically apparent from current attrition trends that a broader target base in North Vietnam is urgently needed.”⁵⁴ Additionally, PACAF’s 1 November

⁵⁰ Edelen, 111.

⁵¹ Edelen, 125-126.

⁵² Department of Defense, DOD Dictionary of Military and Associated Terms, September 2018, accessed on November 5, 2018 from <http://www.jcs.mil/Portals/36/Documents/Doctrine/pubs/dictionary.pdf>, 175. This document defines Order of Battle (OB) as “The identification, strength, command structure, and disposition of the personnel, units, and equipment of any military force.” DIA was the lead Intelligence Community organization for OB during this period, as they are today.

⁵³ Central Intelligence Agency (CIA), 4-5.

⁵⁴ Sharp, 278.

1969 CHECO report offered similar advocacy when it highlighted the impact of President Johnson's March 31, 1968 bombing pause, which allowed, the report asserted, North Vietnam to reconstitute both power production and industry.⁵⁵ This pause was just one of many restrictive measures encountered by targeting officers.

President Johnson, advised by Secretary of Defense Robert McNamara, imposed significant restrictions throughout Rolling Thunder. The intent of these restrictions was two-fold. First, provide North Vietnam a path to negotiations by applying gradual pressure (as opposed to the sharp blow which the Johnson Administration considered too severe, and inconsistent with this objective). Second, prevent widening the war with either the Soviet Union or China, whom provided significant military aid and advisors (primarily Soviet) throughout the war, many at the Haiphong port, at various SAM sites, and airfields. Air operations were thus restricted for the most part to the southern half of North Vietnam, south of the 20th parallel. Johnson did not authorize any targets near Hanoi or Haiphong until June 1966.⁵⁶ Further restrictions included a buffer zone on the border with China, and limits on attacking facilities with Soviet advisors. This included the Phuc Yen airfield, home to North Vietnamese MiG aircraft. Despite posing a threat to attacking U.S. aircraft and recommended for strike as early as the JCS 94-target list, it was not attacked until late 1967. One scholar asserted that, "according to any rational targeting policy" the airfields "should be hit first in the campaign..."⁵⁷

Edelen thus used intelligence assessments, PACOM targeting options, and the Administration's restrictions to guide his targeting throughput process. Though it is unclear he incorporated computing capability to help him prioritize and sort through target inputs from PACOM, and potentially from DIA, he employed several tools. Foremost, he used JCS-approved contingency planning papers and

⁵⁵ Headquarters PACAF, 28 and 29.

⁵⁶ Clodfelter, 85.

⁵⁷ Tilford, 109.

guidelines, along with specific guidance set forth by the CJCS, to guide his target development.⁵⁸ He also had computational tools to assist his weaponeering efforts, primarily as a way to ascertain sortie requirements and time duration for certain campaigns.⁵⁹ These tools would likely have been used to compute the time requirements for the JCS 94-target list.

Additionally, as a career officer in the Air Force, Edelen was clearly influenced and guided by Air Force doctrine. For example, Edelen refused to differentiate between limited war and general war. He stated, “I don’t exactly understand the strategy for limited war as opposed to the strategy for any war. It calls for the use of as much power as we have...I don’t know that needs sorting out...”⁶⁰ It is almost as if he is paraphrasing the 1959 Air Force Manual 1-2 “Basic Doctrine”, which advocated that “The best preparation for limited war is proper preparation for general war.”⁶¹ In another instance, Edelen seemed guided by the 1954 Air Force Manual 1-8 “Strategic Air Operations” which asserted that “the fabric of modern nations is...a complete interweaving of major single elements.”⁶² Congruent with this perspective, he felt that Rolling Thunder would have been more effective if “...we had a broader target base to start with and if, during the course of the campaign, we had been authorized to go after the more significant targets in the country.”⁶³

Edelen principally produced one type of output for targeting strategic persuasion: candidate target nomination lists with sortie requirements and expected duration. As discussed earlier, the JCS 94-target list shaped and drove his efforts. The preponderance of facilities on the list were linked to the strategic persuasion framework, 70 targets in total. The accompanying air plan for the full 94-target list called for 13 weeks of air strikes in four phases.⁶⁴ Edelen commented that there were only “...so many

⁵⁸ Edelen, 6.

⁵⁹ Edelen, 90.

⁶⁰ Edelen, 48.

⁶¹ Clodfelter, 31.

⁶² Clodfelter, 36.

⁶³ Edelen, 112.

⁶⁴ Kamps, 77.

physical structures in North Vietnam that contribute to its war making capability and these were the targets that were recommended for strikes.”⁶⁵ With each Rolling Thunder iteration at-hand, Edelen and his team produced strategic persuasion targeting options, nominated for approval at the Tuesday luncheon at the White House.⁶⁶ His resolve to successfully execute strategic persuasion targeting would only be matched by officers determined to conduct interdiction targeting.

Targeting for Interdiction

Interdiction was a resounding and enduring focus for all the targeting actors throughout this period. The 94-target list contained 24 interdiction targets, even in 1964. In-country, James Enney focused on finding new targets along LOCs and expeditiously developing target folders to enable aircrews to attack them. As a result of being in Seventh Air Force later (1966-1967) than Enney, with both an increased U.S. footprint in-country and more capable North Vietnamese air defense network of which to contend, Thomas Greenhalgh necessarily focused on managing a larger enterprise, but focused on interdiction as well.⁶⁷ Howard Smith also concentrated on interdiction, particularly in Laos. He advocated for B-52 Arc Light⁶⁸ operating areas to the U.S. embassy in Laos staff as a primary tool for this interdiction, and was at least partially successful by gaining approval for this in late 1968.⁶⁹

In support of PACOM, Pat Goforth at PACAF noted that LOC activity analysis became “an unanticipated major involvement developed in the assessment area which was peculiar to the war in SEA [Southeast Asia].”⁷⁰ PACAF’s LOC analysis evaluated existing rail lines, roadways, and waterways; construction of new routes and bypasses; and finally, fixed facilities which supported the traffic, such as truck parks and supply storage areas. The goal was to calculate the enemy’s transportation system

⁶⁵ Edelen, 111.

⁶⁶ Edelen, 3-4.

⁶⁷ Berger, 44, and Clodfelter, 128-131.

⁶⁸ Nalty, 38. Arc Light related to B-52 targeting boxes, large areas designated for what is popularly called “carpet bombing.”

⁶⁹ Nalty, 45.

⁷⁰ Berg, 159.

capacity and determine trends. This, Goforth judged, gave commanders a more accurate picture.⁷¹ Using this analysis, PACOM attempted to identify interdiction strategies. In mid-March 1965, Admiral Sharp stated that he “...prepared an attack plan against LOC targets to counter enemy infiltration. I utilized the findings of a study group established in my headquarters the previous month.”⁷²

At the JCS, Henry Edelen also examined targets for interdiction, although his focus was on the locales where the supplies started their flow. There was no more significant starting location, in the eyes of the military, than the Haiphong harbor. DIA assessed that Haiphong was a major conduit for military imports, including ammunition and weapons, and the JCS agreed. Edelen claimed Haiphong imported 95 percent of military materials.⁷³ Admiral Sharp, writing after the war in 1978, claimed a smaller amount, 85 percent, but shared the JCS view of Haiphong’s critical importance.⁷⁴ To Edelen, it made the most sense to “...strike the imports at the mouth of the funnel before the goods were distributed. The further down the line you go the more widely dispersed the war supplies are...striking the materials after they have been dispersed is the hardest way to destroy them.”⁷⁵ Thus, the targeting officers viewed interdiction differently, depending on their tasks and proximity to the battlefield. One common aspect for those serving in the 1967-1968 timeframe

Known alternatively as Igloo White, and derisively, the “McNamara Line,” the Anti-Infiltration Barrier had its roots in a McNamara request, in June 1966, that the Jason group of scientists consider options to increase the effectiveness of interdiction operations. In response, the group designed an Anti-Infiltration Barrier with five components. First, it contained acoustic sensors, both anti-personnel and anti-vehicle types, distributed along the Ho Chi Minh Trail. Second, it employed aircraft capable of acquiring and retransmitting sensor signals enemy forces generated by their passage. Third, it utilized

⁷¹ Berg, 159-160.

⁷² Sharp,

⁷³ Edelen, 87.

⁷⁴ Sharp, 3.

⁷⁵ Edelen, 111.

communication links for signal processing at a target designation headquarters in Nakhon Phanom, Thailand. Fourth, it sent subsequent attack orders to combat aircraft having the mission of attacking the traffic on the trails. Fifth and last, fighter and attack aircraft served as the “finishing” component.⁷⁶ TF-Alpha ran the operations associated with the barrier from the Nakhon Phanom headquarters.

The closer one was to the in-country interdiction effort, with an accompanying ground employment role, the more likely they supported it. The JCS, operating primarily at the strategic level, offered only conditional support, on the basis that it would not interfere with the war’s other resource demands.⁷⁷ Edelen reflected this ambivalence by observing that “I didn’t notice that the barrier system impinged on any of the capabilities or the authorizations for strikes in North Vietnam.”⁷⁸ At PACOM, Admiral Sharp offered little support for it as well, arguing that the barrier would be limited if the starting LOC points, in Hanoi or Haiphong, were not neutralized.⁷⁹ In contrast, General Westmoreland was supportive, and active in shaping its final form by diverting anti-personnel sensors to support the Marines under siege at Khe Sanh in January 1968.⁸⁰

In-country Airmen conveyed mixed reviews. Lieutenant General William Momyer, the Seventh Air Force Commander from 1966-1968, saw its potential for providing timely intelligence, but objected to handing over his command and control of tactical aircraft to the Anti-Infiltration Center at Nakhon Phanom for the anti-vehicle part of the barrier, which came to be known as Igloo White.⁸¹ He may have been reflecting what his aircrews felt, who saw Igloo White as inadequate for the task of controlling fast-moving operations on the Ho Chi Minh trail. They preferred the C-130 airborne command and control

⁷⁶ Deitchman, 876.

⁷⁷ Van Staaveren, 261.

⁷⁸ Edelen, 84.

⁷⁹ Sharp, 134.

⁸⁰ Deitchman, 882.

⁸¹ Deitchman, 881-882.

platform and/or forward air controllers.⁸² Still, Colonel Smith gained and used intelligence from Igloo White to drive his target selection in certain cases.⁸³ Further, Brigadier General William Evans, Commander of the 31st Tactical Wing based in Thailand, felt that a dedicated strike force employing Igloo White data could stop truck traffic in Laos. Evans seemed to have based his assessment on the claim that only 15 percent of the traffic identified by Igloo White could be struck.⁸⁴ Thus, views on the Anti-Infiltration Barrier differed significantly depending on location and mission.

The inputs, throughput, and outputs of the overall Interdiction effort were nearly as diverse, although many of these variables were the same as those variables for strategic persuasion. For example, the Administration's operational restrictions were the same. Similarly, while the targets may have been different, the same process existed for receiving and processing PACOM targeting options and lists. However, intelligence inputs for each targeting actor differed significantly. Each level possessed a unique intelligence environment, depending upon resources available to them, assigned mission, and time constraints. Further, the throughput and outputs of Interdiction targeting for each of the respective targeting officers varied widely as well. The discussion which follows will focus on the aspects of inputs, throughput, and outputs unique to interdiction. The first, and arguably most consequential aspect, was intelligence.

Intelligence drove interdiction. In-country, Tac Recce, such as the RF-101 and later the RF-4, were photo reconnaissance workhorses and provided the greatest share of intelligence inputs. With resources aplenty, their production was nearly overwhelming. Greenhalgh remembered that "So many pictures came in that the photo interpreters were swamped."⁸⁵ In addition to Tac Recce, Enney tapped

⁸² Andrews, William. "To Fly and Fight: The Experience of American Airman in Southeast Asia." PhD diss., George Mason University, 2011. Accessed October 7, 2018. http://mars.gmu.edu/bitstream/handle/1920/6332/AndrewsW_dissertation_2011.pdf?sequence=1&isAllowed=y, 443.

⁸³ Nalty, 38.

⁸⁴ Deitchman, 882.

⁸⁵ Clodfelter, 131.

special intelligence, albeit sparingly and sanitized so he could share.⁸⁶ Human intelligence was also available to in-country organizations, including ground probes into the Ho Chi Minh Trail by Laotian tribesman, and border patrolling by U.S.-trained South Vietnamese personnel. To supplement this and orient them to their mission in the TIC, Enney sent his PIs on Ranch Hand missions into Laotian areas, with 70-millimeter cameras to understand the “lay of the land” and help develop interdiction targets.⁸⁷ Last, Howard Smith found that the Anti-Infiltration Barrier provided electronic detections which were a rich source of intelligence for the interdiction mission. Thus, the multi-intelligence environment in-country provided a high volume of intelligence from which the targeting officers could develop options.

To exploit this volume, both PACOM’s air component and the JCS sought to emphasize an integrated approach to the intelligence input. Goforth guided his PACAF team to fuse photo reconnaissance, human intelligence, and special intelligence. Like Greenhalgh, his team was challenged with the volume of images which required exploitation. Additionally, he thought many PIs suffered from poor training and inexperience, partly as a result of an orientation to targets in the Soviet Union.⁸⁸ Although Edelen at the JCS did not have a specific team of PIs assigned to him, he had access to the national intelligence agencies. Both the CIA and DIA provided him fused analysis, often focused on evaluating North Vietnam on a strategic level. With this perspective, LOCs led to and from the Soviet Union and China, particularly the Haiphong Harbor. His team would conclude that “...it would take just a matter of weeks to effectively knock these Haiphong targets...and to force North Vietnam into less efficient means of importing, supplying and distributing their essential material.”⁸⁹

⁸⁶ Enney, 17.

⁸⁷ Enney, 11 and Tilford, 72. Ranch Hand missions employed defoliants in attempt to remove dense jungle underbrush along roads, waterways and railroads. Their purpose was, ostensibly, to reduce the chances for ambush.

⁸⁸ Berg, 160.

⁸⁹ Edelen, 90-91.

With intelligence, in its many varieties, as its primary input, the targeting actors employed unique tools as part of their throughput process. In-country, these tools differed based on when they were in-country. Operating in the 1965-1966 timeframe and literally setting up the TIC from scratch, Enney's interdiction tools were not technology driven, but rather focused on his unique organizational setup and the physical layout. These tools enabled him to organize workflows and gain situational awareness on LOCs; this in turn meant targets identified quicker, and prosecuted sooner.⁹⁰ Enney was just as committed to working with other agencies and CTF-77: "You have got to have liaison with the other service intelligence organizations...the targets people have got to have a continuing dialogue..."⁹¹ Several years later, from 1967-1968, Smith had far more technology at his disposal. The Anti-Infiltration Barrier's recce-strike fusion center at Nakhon Phanom enabled him the possibility of integrating intelligence and operations in real-time. Taking advantage of this, he took their target recommendations and even requested help with BDA after B-52 interdiction raids.⁹²

Consistent with their broader view of the battlespace, both Goforth and Edelen would attempt to employ systems-level throughput tools to their interdiction approaches at PACAF and the JCS, respectively. Goforth utilized procedure and assessment criteria; Edelen, as with strategic persuasion, tapped planning papers and guidelines. Of the many target systems they analyzed for interdiction, none was perhaps more vexing than POL. They could not discern how much effort they required to neutralize it, and they were continually challenged in assessing bombing's effectiveness on the POL system.

Conventional Air Force and military thinking considered POL a vital LOC target. No military could operate without it, and even North Vietnam required it to power the thousands of trucks which brought logistical supplies to the Vietnam, the MiG-forces which opposed U.S. aircraft in Rolling Thunder, and the plethora of military vehicles required to reposition both troops and equipment to areas they were

⁹⁰ Enney, 13.

⁹¹ Enney, 12.

⁹² Nalty, 38.

needed most. Attacking POL not only served interdiction purposes, but also potentially addressed strategic persuasion purposes as well. Admiral Sharp considered it a critical line of operations along these lines. He repeatedly made this point in messages to the JCS, noting in an October 1966 message to the JCS that POL destruction was part of a way to put pressure on North Vietnam, “to cause him to reconsider his support of the aggression.”⁹³

Still, considerable debate existed on how to measure success in the summer of 1966.⁹⁴ PACAF and Goforth, using procedures and assessment criteria as their tool, argued for actual quantities destroyed; when destruction was adequate, the operations could move on to more lucrative targets. The JCS and Edelen argued for storage capacity, using their planning papers and guidelines, a method endorsed by the CIA and DIA.⁹⁵ Using different lenses, there were several POL targets of which PACAF and the JCS could not agree on assessed damage. They eventually did agree, but the effort to reach consensus meant lost opportunities to use assets for other purposes.

These throughput differences also reflected in the various outputs of the targeting actors. For the in-country targeting officers like Enney, Greenhalgh, and Smith, their outputs were airstrikes against trucks, cutting roads and railroads, and sinking boats on the waterways. It might also include attacks against fixed facilities such as bridges, rail yards, truck parks and maintenance facilities. Though some of those targets impacted the flow of supplies down south to the Viet Cong, the effect was often temporary. Further, approvals and directions on specific interdiction targets was sometimes mystifying. Greenhalgh recalled a message which arrived from Washington asking why Seventh Air Force had not attacked a missile propellant storage area near Hanoi. Greenhalgh and his team could not find the target, and it only seemed as if a village was located at the target coordinates. Despite this, he was

⁹³ Sharp, 278.

⁹⁴ Berg, 243.

⁹⁵ Berg, 240.

instructed to bomb it. After initial confusion on what to bomb, the aircrews bombed the village, and “...wiped it out. There was no sign of missile propellant or anything else of military value.”⁹⁶

While the in-country targeting officers struggled with these types of uncertainties, Goforth sought to ascertain the LOC flow from North Vietnam and provide outputs which could impact it. Based on their LOC analyses, Goforth noted that “...recommendations were frequently made both to Seventh Air Force and CINCPAC for strikes against certain targets and target systems.” Some of the recommendations led to target approvals. PACAF also analyzed and recommended other potential target systems such as dikes, dams, and river locks, but higher authorities rejected those suggestions.⁹⁷ The CHECO Reports were yet another output. PACAF’s 1 November 1969 CHECO mentions interdiction and LOC attack, with narratives and statistical summaries, on nearly every one of its 45 pages.⁹⁸

At the JCS, Edelen’s primary output were target nomination lists provided for Presidential approval. The various iterations of Rolling Thunder provided him ample opportunity to request interdiction targets, as these targets were often approved, especially if not located in the Northeast Quadrant of North Vietnam. Representative of these types of products is JCS Memorandum (JCSM) 221-65 from 27 March 1965, Subject: Air Strike Program Against North Vietnam. This JCSM sought approval from the Secretary of Defense for a twelve-week program with an intensive interdiction program. JCSM 221-65 identified 114 targets, including 43 bridges, ferries, rail yards, port facilities, ammunition depots, radar facilities, and airfields.⁹⁹ While these targets sought to address the military capabilities of North Vietnam, the third and last line-of-effort attempted to address the North Vietnamese strategy itself.

⁹⁶ Lieutenant Colonel William Greenhalgh, Letter to Mark Clodfelter, 4 April 1987.

⁹⁷ Berg, 162.

⁹⁸ Headquarters PACAF, 10. For example, the 1 November 1969 CHECO report asserts that “The interdiction campaign interrupted movement significantly on 18 September, [1967] when three of the four bridges were rendered unusable. The capacity for distributing supplies by land was further reduced to 1,900 short tons per day (STPD) with the destruction of the Kien An Highway Bridge on 26 September.” As with the other targeting officers, Goforth and PACAF tried very hard to quantify the impact of interdiction.

⁹⁹ JCSM-221-65, *Memorandum for the Secretary of Defense, Subject: Air Strike Program Against North Vietnam*, 27 March 1965.

Targeting to counter the North Vietnamese strategy

The North Vietnamese strategy was a unique application of People's War, inspired by Mao Tse-Tung. Mao's contribution to the theory of warfare is a closer interlinking of the people, the army, and the government.¹⁰⁰ "The richest source of power to wage war lies in the masses of the people," Mao asserted.¹⁰¹ To win a protracted war of national liberation, Mao laid out three types of warfare: positional, guerilla, and mobile.¹⁰² In positional warfare, military operations are sporadic; more focus was placed on training cadres, organizing the peasants, and gathering strength for the cause. If needed, this effort would be repressive: "All things grow out of a barrel of a gun."¹⁰³ Guerilla warfare exploits the gathering strength of the revolution by attacking isolated enemy outposts and conducting patrols with a two-fold purpose: undermine the faith of the people in the government and increase the prestige of revolutionaries in opposing the government. Guerilla fighters transform themselves into conventional military forces in mobile warfare, and confront and defeat the government forces in pitched battle. Mobile warfare is ideally the third and last phase of People's War, but Mao advocated that all types of warfare occur simultaneously, depending on the enemy's strength and local conditions.¹⁰⁴

North Vietnam's strategy incorporated three stages, with tactics both offensive and defensive, depending on a variety of conditions and always powered by the people.¹⁰⁵ General Vo-Nguyen Giap, the Minister of Defense during this period, boasted that the North Vietnamese people were "...courageous, undaunted, full of fighting experiences, and united as one."¹⁰⁶ He explained in 1968 the goal of the political program for "our southern people: to unite all the people, resolutely to defeat the

¹⁰⁰ Nagl, 21.

¹⁰¹ Mao Tse-Tung, *Selected Military Writings* (Peking: Foreign Language Press, 1967), 260.

¹⁰² Mao, 248.

¹⁰³ Mao, 275.

¹⁰⁴ Mao, 244-257 and Nagl, 23.

¹⁰⁵ Wray Johnson, *Vietnam and American Doctrine for Small Wars* (Bangkok: White Lotus Press, 2001), 52.

¹⁰⁶ Giap, 27.

U.S. imperialists' war of aggression, to overthrow the puppet administration..."¹⁰⁷ The desired result was an independent government in the south, detached from the U.S., and eventually reunified with North Vietnam, "the fatherland."¹⁰⁸

To accomplish this objective, North Vietnam identified and executed five primary tasks. First, build and sustain a nation at arms, which could endure privations and willingly sacrifice themselves for the cause. Second, secure both the moral and material support of fellow communist countries, namely the Soviet Union and China. Third, build a military which could attrite U.S. air power just enough to claim victory over the aggressors. Fourth, as capable, supply and support with military forces the Viet Cong. Fifth and finally, go on the offensive with a propaganda campaign designed to erode American public support, reduce international support for the U.S. effort, and decrease the South Vietnamese people's support of its government. These were the elements of its People's War Strategy, which the U.S. targeted, although rarely with developed intentions and a coherent strategy.

The only strategy element the U.S. addressed officially, albeit indirectly, was the South Vietnamese people's support for its government. One objective during Rolling Thunder was to boost the morale of the South Vietnamese government.¹⁰⁹ Arguably, this objective was both the most difficult to achieve and the hardest to measure with bombing. Yet, it represented, at the very least, an attempt to counter the North Vietnamese strategy. The main challenge to accomplishing it was the dysfunction of the South Vietnamese government. Plagued with numerous coups, corruption and incompetence, it was clearly losing the war in the countryside to the Viet Cong. The bombing of the North, it was thought by senior U.S. officials, would show Saigon that the weight of American military power was linked to their cause, and enable governmental stability.¹¹⁰

¹⁰⁷ Giap, Vo Nguyen, *"Big Victory Great Task"* (New York: Frederick A. Praeger, 1968), 105.

¹⁰⁸ Giap, 105.

¹⁰⁹ Edelen, 113, McMaster, 227 and Tilford, 105.

¹¹⁰ Tilford, 105.

Targeting officers were also involved in three other activities which addressed the People's War concept. First, there were genuine efforts to limit collateral damage; this provided a counter to North Vietnam's propaganda attempts to portray the U.S. as brutal aggressors with no restraints, in support of its task to erode U.S. and international support. Rolling Thunder bombing was aimed at military targets and sought to minimize collateral damage to civilians, even imposing risk on U.S. planes and pilots as they took mitigation measures.¹¹¹ Some of these measures included striking targets only under favorable weather, choosing axis of attacks which limited weapon dispersion in populated areas, and employing the most precise weapons as possible.¹¹² Yet, the U.S. often had difficulty making the case it was fighting with restraints, as North Vietnam consistently took the propaganda offensive to claim the U.S. was bombing indiscriminately, targeting "...cities, populated areas, schools, hospitals, markets..."¹¹³

Second, targeting officers recognized the need to match the will and endurance of the North Vietnamese, particularly regarding their determination and sacrifice to keep the Ho Chi Minh trail open. The method to accomplish this, the targeting officers thought, were unrelenting attacks against the repair activities. Enney called it the "...action-reaction cycle. He is going to do something when you drop ordnance...at an interdiction point, if it is essential to him, he will throw enough resources in there to keep it open no matter what you do, even if it is only for 25 minutes a day."¹¹⁴ This determination, however, was rarely matched by U.S. targeting efforts.

The third and last targeting activity was selective employment of U.S. air forces in order to prevent North Vietnamese claims of victory. In some forms, this came as a request to destroy the North Vietnamese build-up of air defenses, evidenced as early as the JCS 94-target list. In other cases, it meant not employing an asset whose destruction would translate into a North Vietnamese, or a communist

¹¹¹ Andrews, 89.

¹¹² Sharp, 128.

¹¹³ Giap, 16.

¹¹⁴ Enney, 8.

ally, claim of victory. At Seventh Air Force, Greenhalgh concluded the risk of losing a B-52 gave “...the Soviets and the other Communist nations a psychological plum.”¹¹⁵

In addition to military intelligence and restrictive control measures, inputs to this targeting line of effort included other sources of information, such as covert diplomatic reports, CIA non-military estimates, North Vietnamese press releases, reports from non-governmental organizations, and South Vietnamese communications, both political and military. According to the evidence, targeting officers at all levels do not seem to have investigated these other sources with regularity.¹¹⁶ They did, however, attempt to digest and understand the military intelligence which assessed the North Vietnamese determination to keep the Ho Chi Minh trail open. They were also aware of North Vietnamese improvements to its air defense, as these activities increased risk for certain Rolling Thunder missions.

Yet, by not focusing on some of the other sources, targeting officers were challenged to address the North Vietnamese strategy in full, and thereby understand the limits of U.S. targeting efforts. The CIA, in the aforementioned Target Study, ominously mentioned in 1965 that it had “...not been able to identify a target system in North Vietnam which, if successfully attacked, would carry with it a higher degree of assurance of crippling the effectiveness of Viet Cong ground forces presently deployed in South Vietnam.”¹¹⁷

As with inputs, the targeting officers would also be hampered, by choice or negligence, by a lack of throughput tools to address the North Vietnamese strategy. Two possibilities for addressing the North Vietnamese were doctrine and operational concepts. In both areas, the targeting officers operated at a deficiency. There was little doctrine written, for example, on how targeting could address a counterinsurgency. Air Force Manual (AFM) 1-1, *United States Air Force Basic Doctrine*, published in August 1964, did include a chapter in counterinsurgency operations. However, AFM 1-1 emphasized the

¹¹⁵ Berg, 345.

¹¹⁶ Berg, 185.

¹¹⁷ CIA, 2.

need for the U.S. to have forces which could put enemy forces at-risk, and deterrence (of these lesser conflicts) remained an enduring theme.¹¹⁸ Thus, nuclear forces were maintained as a high priority of the Air Force, with far less priority to counterinsurgent capabilities.

Operational concepts relating to counterinsurgency were also few in supply, but one would have impact in a variety of ways. Embedded in the 1964 AFM 1-1 version and central to the Air Force's identity was the concept of centralized command and control. This concept was critical for any type of warfare, in the Air Force's view, as it enabled the most efficient way to use scarce air power and enabled synergistic effects by tightly integrating operations. Yet, there was no single air manager for either operations or target selection,¹¹⁹ and the resulting decentralization ensured operational forces would integrate only out of necessity. Route Packages, established in November 1965 by an Air Force-Navy Coordinating Committee, codified this lack of integration by dividing North Vietnam into six target zones (a seventh was added in April 1966); the Air Force had responsibility for Route Packages 5 and 6A in the north, the Navy had responsibility for Route Packages 2, 3, 4, and 6B which included the center part of the country and the Northeast, and MACV received authority to schedule strikes in Route Package 1, located immediately north of the DMZ.¹²⁰ Edelen thought this lack of centralization command and control created the effect where a wing commander "...was more or less running their little individual air war."¹²¹ Hampered with insufficient inputs and lacking throughput tools, the targeting outputs were unsurprisingly feeble in addressing the North Vietnamese strategy.

The outputs from this targeting line of effort, produced by in-country organizations, PACOM, and the JCS, were primarily lists and strategies indistinguishable from those oriented to strategic persuasion and interdiction. The North Vietnamese strategy, which itself was tightly integrated by a

¹¹⁸ Robert Futrell, *Ideas, Concepts, Doctrine: Basic Thinking in the United States Air Force, 1961-1984* (Maxwell AFB, Ala.: Air University Press, 1989), 232-234.

¹¹⁹ Enney, 8, and Edelen, 128.

¹²⁰ Edelen, 51-53 and Clodfelter, 129.

¹²¹ Edelen, 128

highly centralized command and control cadre, was not addressed in a substantive way in any RTTL, Armed Recce concept, CHECO report, or PACOM targeting list. Earl Tilford backs this up in *Setup*, mentioned in the literature review, by asserting “Air Force leaders, especially the air commanders in Saigon, Honolulu, and Washington...could not—indeed did not—develop a strategy appropriate to the war at hand. In fact, they failed to articulate any coherent strategy at all.”¹²²

Targeting successes and failures

On balance, as the preceding discussion conveys, the targeting efforts of the actors examined revealed both significant successes and catastrophic failures in targeting. This paper asserts three notable successes: the JCS 94-target list, the fusion of intelligence sources to inform target development and BDA, and the Anti-Infiltration Barrie. These targeting successes were encumbered by some limitation, but they provided enduring models for the military. This paper contends there were an equal amount of failures: inability to convince defense senior leaders of target selection efficacy, lack of targeting integration, and the inability to find viable targeting strategies to counter the North Vietnamese strategy.

The three successes spread across the examined period, beginning with the JCS 94-target list in 1964. This targeting list relied on solid intelligence and employed mature doctrine as its primary throughput tool. It was really a veiled strategy, and supported in total the Rolling Thunder objective of strategic persuasion. Even though it was politically unacceptable, it offered a “sharp blow” option for civilian decisionmakers. Refusing to accept it, the civilian leaders effectively began the process of selecting specific targets, often judged by the military to be arbitrary and inconsistent with their own objectives. “It is not surprising,” asserts McMaster in *Dereliction of Duty*, “that reports indicated Rolling Thunder neither significantly impeded the flow of supplies to Communist forces nor discouraged North

¹²² Tilford, xviii.

Vietnam from continuing its support for the war in the South.”¹²³ Camps, also identified in the literature review above, asserted that the JCS 94-target list conveyed a realistic appreciation for North Vietnam, and was calibrated to the war aims.¹²⁴

Henry Edelen was not directly responsible for the list, but he did attempt to advocate the concepts organic to it for many years after arriving in May 1965.¹²⁵ Years later, during Desert Storm, the 1991 operation to expel Iraqi forces in Kuwait, one specific effort resembled the JCS 94-Target list to a staggering degree. Instant Thunder, a strategic persuasion effort aimed at the Iraqi regime, contained 84 targets to be struck at the beginning of the campaign, including many of the same types of targets in the JCS 94-target list.¹²⁶ For the most part, Instant Thunder was executed as envisioned, and was credited by many military observers as having an important role in Desert Storm’s success. Henry Edelen would likely have recognized the intent of Instant Thunder and would not have been surprised by its outcome, since the aim of the JCS 94-target list served the same purpose.

Just as determined to make a meaningful and long-term impact, James Enney (April 1965-April 1966) and Pat Goforth (1966-1968) attempted to fuse multiple intelligence sources, disciplines, and stovepipes to provide targeting options in North Vietnam and Laos. Enney merged photo reconnaissance with target development to create the TIC. Goforth used the multiple inputs of photo reconnaissance, special intelligence, and HUMINT to develop a comprehensive LOC system analysis, used to both develop targeting lists and ascertain BDA. Enney and Goforth contributions were impactful, by both making interdiction efforts more efficient and reducing the risk of aircrews returning to a target already neutralized. Significantly, these efforts were on the leading edge of the intelligence fusion which is commonplace today and considered a best practice by targeting professionals.

¹²³ McMaster, 287.

¹²⁴ Kamps, 79.

¹²⁵ Edelen, 57.

¹²⁶ Richard Reynolds, *Heart of the Storm: The Genesis of the Air Campaign Against Iraq* (Maxwell Air Force Base, Alabama: Air University Press, 1995), 54-55, 98.

Despite the lack of unanimous advocacy at the time, the Anti-Infiltration barrier was also a targeting success. It served as an input (intel provided by the sensors), a throughput tool (recce-strike concept and the Operations Center at Nakhon Phanom), and an output (target nominations to Seventh Air Force). There were notable successes and targeting officers such as Howard Smith at Seventh Air Force attempted to exploit them. Further, the system significantly affected the way in which U.S. forces conducted interdiction from 1968 on, and presaged key aspects of the equipment and operation of the U.S. military command and control concepts and fusion centers decades later.¹²⁷

These successes, however, were overcome by failures. First, the best efforts of these targeting officers did not enable their senior commanders, such as CINCPAC and CJCS, to gain approval of the targeting options they proposed. Joseph Califano, a key aide to President Johnson, sat in on National Security Council meeting in January of 1966, and witnessed an assessment of the situation from the Joint Chiefs of Staff with an accompanying recommendation to resume bombing after an ordered pause. A domestic advisor, he was not normally in these meetings, but he came away unimpressed, conveying to the President that “the case made...for resumption...was totally unconvincing.”¹²⁸ Arguably, this is not a fair critique on the targeting officers, as it places blame on those not responsible for making the case. Yet, often they were their own worst enemy with their missteps, which contributed to failure.

The lack of targeting integration, the second identified failure, provides such an example. The lack of targeting integration prevented effective interdiction. Henry Edelen on the Joint Staff, fixed on North Vietnam, cared little about the targeting in Laos, and did not attempt to utilize the Anti-Infiltration Barrier.¹²⁹ At the in-country level, James Enney, at 2d Air Division, cared little about the JCS target folders which contained many of the key interdiction targets in the Northeast Quadrant of North

¹²⁷ Deitchman, 869.

¹²⁸ Joseph Califano, *The Triumph and Tragedy of Lyndon Johnson: The White House Years* (Touchstone: New York, 2015), 113.

¹²⁹ Edelen, 84.

Vietnam. He considered it a burden to maintain these “sophisticated folders.”¹³⁰ More harmful, none of the targeting officers had a complete understanding of the LOC flow, from the Haiphong harbor to the Ho Cho Minh trail to the battlefield. They focused on their aspect of it and neglected the rest: Edelen on Haiphong, Goforth on the distribution network through North Vietnam and Laos, and Smith on the trails from Laos into South Vietnam. They lacked integration, so it is unimaginable how they could have created coherent targeting solutions for interdiction.

Still more impactful however, the targeting officers were unable to create, develop and advocate viable targeting strategies for countering the North Vietnamese strategy. As discussed above, there were limited successes. But the industrial mindset ingrained in the targeting actors did not serve them well in their efforts. In 1965, the U.S. Intelligence Board concluded that bombing North Vietnam would probably not stop the insurgency in the South.¹³¹ The benefits of hindsight aside, the targeting actors can only be evaluated for the viability of their targeting options. Fixated on strategic persuasion and interdiction, they did not seriously counter the North Vietnamese determination to keep the Ho Chi Minh trail open, lacking both endurance and imagination. They did not offer policymakers a way of creating friction between North Vietnam and its sponsor states, the Soviet Union and China. They paid some attention, but perhaps not enough, to the perceptions of their targeting efforts. Yet in the final analysis, as Clodfelter pointed out, “To be effective, bombing had to eliminate the prospect of Communist victory in the South. It could not do so.”¹³²

III. Conclusion

The United States continued aerial bombing through the end of 1972. Far less bombing occurred during these four years in North Vietnam, but twice in 1972 that intensity would dramatically increase for Linebackers I and II. During Linebacker II, the U.S. military attacked strategic targets in Hanoi and

¹³⁰ Enney, 3.

¹³¹ McMaster, 229.

¹³² Clodfelter, 140.

mined the Haiphong harbor, both of which were argued for vociferously from 1964-1968 by Admiral Sharp and advocated for the most part by the Joint Chiefs. Linebacker II's results have been widely debated over the decades, but the historical weight of judgement leans to a narrative that it successfully persuaded the North Vietnamese to reenter peace negotiations. This paper does not rely on this narrative, but rather acknowledges that it provides an intriguing analytical basis for considering whether strategic persuasion was possible in 1964 by full execution of the JCS 94-target list.

This paper has instead focused on the target selection from the period, on its own merits, and examined it to understand whether it was a potential causation for military failure. It sought to explain how targeting officers selected targets for aerial bombing, and discusses the targets they nominated for higher authority strike approval. Its vantage point was the perspective of the targeting officer, and how these targeting officers conducted their duties from one of three different locations. These targeting officers worked within boundaries both imposed upon them and created by themselves. Within their input-throughput-output frameworks, James Enney, Thomas Greenhalgh, Howard Smith, Pat Goforth, and Henry Edelen utilized specific inputs, employed tools and technologies, and created targeting strategies, selected targets and forwarded target nominations up their chain of command.

Investigation revealed both successes and failures, thus complicating the narrative of ineffective target selection efforts. Targeting officers offered well-calibrated and viable targeting strategies, fused intelligence sources to ascertain with some accuracy North Vietnamese logistical flow, and adopted cutting-edge technology linking sensors, communications, intelligence, and strike operations. These successes remain impactful even today. However, these targeting officers were unable to convince defense senior leaders of target selection efficacy, egregiously lacked targeting integration, and proved incapable of creating viable targeting strategies to counter the North Vietnamese strategy. This paper analyzed the nuanced story of target selection in the first years of aerial bombing in North Vietnam and

Laos, taking the narrative away from the White House and assigning agency to the targeting officers in-country, in Hawaii, and Washington, D.C. Yet it requires additional discovery to fill its holes.

Further research should incorporate more primary sources, analyze the stories of both more targeting officers and North Vietnamese sources, and assess the depth and efficacy of more targeting lists and strategies. This research was limited by the large queue to obtain digital archived sources at the AFHRA. The literature review and initial research identified primary source candidates, and these were requested, but the AFHRA was unable to fulfill these requests in a timely manner. Additionally, this research paper could not discover the archival location of some potential primary sources. For example, one secondary source cited interviews of targeting officers in Task Force-Alpha, but research failed to determine the location of these interviews. Notwithstanding the challenge of acquiring candid narratives, additional North Vietnamese sources would enhance both the depth of perspective and possibly provide a more accurate basis to analyze targeting effects. Finally, primary source target selection or nomination lists, along with detailed strategies, were few. Some sources were uncovered and used extensively, but further research should widen the breadth of possible discovery. All these recommended research efforts provide the promise of an even more detailed narrative, potentially revealing more successes and or failures, and complicating the traditional narrative even further.

Glossary

AFHRA	Air Force Historical Research Agency; located at Maxwell Air Force Base, Alabama.
Arc Light	B-52 targeting boxes; Arc Light missions included large areas designated for what is popularly called “carpet bombing.”
Armed Recce	Armed Reconnaissance; a common mission conducted in North Vietnam and Laos whereby a fighter or attack aircraft would traverse a road for the dual purpose of reconnaissance and attacking trucks if spotted.
ARTS	Armed Reconnaissance Target System; numbering system for interdiction targets, created by Major James Enney in his role as Chief of the Target Intelligence Center at 2d Air Division, 1965-1966.
BDA	Battle Damage Assessment; targeting officers conducted BDA to assess the effects of aerial bombing using both aerial reconnaissance and other sources of intelligence.
CIA	Central Intelligence Agency
CINCPAC	Commander-in-Chief, Pacific Command; for nearly the entire 1964-1968 period, Admiral Grant Sharp was the CINCPAC.
CJCS	Chairman, Joint Chiefs of Staff; for much of the 1964-1968 period, General Earle Wheeler was the CJCS.
CTF-77	Carrier Task Force-77; this was the naval component in the South China Sea, which conducted naval operations against North Vietnam, including aerial bombing from naval aircraft.
DIA	Defense Intelligence Agency
JCS	Joint Chiefs of Staff; headquartered in Washington, D.C.
LOC	Line of Communication; includes roads, trails, waterways, and railroads, utilized to transport logistics from North to South Vietnam
MACV	Military Assistance Command Vietnam, headquartered in Saigon, South Vietnam
OPREP-4	Operational Report-4; this report captured aircrew mission data and were subsequently transmitted to headquarters via secure electronic network. The data elements included mission number, target location, numbers and types of aircraft, ordnance expended, weather encountered, aircraft damaged or lost, and remarks about bombing results.
PACOM	Pacific Command, headquartered on the island of Oahu, Hawaii
PACAF	Pacific Air Forces, headquartered on the island of Oahu, Hawaii
PACFLT	Pacific Fleet, headquartered on the island of Oahu, Hawaii
PI	Photo Interpreter; this was an intelligence enlisted individual, trained to look at reconnaissance photographs and identify key elements of a target or interpret damage as the result of aerial bombing
POL	Petroleum, Oil and Lubricants; POL targets were considered key targets by many (including CINCPAC) during this period, since no military could operate without POL, and thus represented a pressure point on North Vietnam if destroyed.
RTTL	Rolling Thunder Target List
SAM	Surface-to-Air Missile; SAMs were a significant hazard to U.S. airmen during this period, as the North Vietnamese acquired more of them and became more capable of employing them effectively by 1968.

Tac Recce	Tactical Reconnaissance; Aircraft such as RF-101 and RF-4s conducted this mission, normally taking photos of preassigned locations including areas bombed, and which were later interpreted by PIs
TF-Alpha	Task Force-Alpha; this organization ran the operations associated with the Anti-Infiltration barrier from the Nakhon Phanom headquarters, which served as a reconnaissance-strike fusion center.
TIC	Target Intelligence Center; this organization combined photo reconnaissance and target development, created and led by Major James Enney at 2d Air Division, 1965-1966.

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