BAILEIGH MCFALL

Retaining U.S. Air Force Combat Aviation Experience

Analyzing Alternative Instructor Career Paths for Fighter Communities

This document was submitted as a dissertation in October 2026 in partial fulfillment of the requirements of the Frederick S. Pardee Ph.D. in Policy Analysis at the RAND School of Public Policy. The faculty committee that supervised and approved the dissertation consisted of Kelly Atkinson, Tara L. Terry, and Monte Anderson.

Dissertation

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Abstract

The Department of the Air Force continues to face a persistent fighter pilot shortage driven not only by production shortfalls, but also by difficulty retaining experienced aviators, particularly instructor-qualified pilots needed to absorb and develop inexperienced aircrew. This dissertation examines whether alternative instructor career paths could help alleviate those pressures and what barriers may limit their successful implementation. It employs a mixed-methods research design combining a dynamic, stochastic Python simulation model of fighter-community personnel flows and absorption dynamics with semi-structured interviews with Combat Air Force (CAF) instructor pilots and first-assignment instructor pilots (FAIP).

The analysis finds that alternative instructor career paths can modestly improve operational experience levels, but their near-term effects on key absorption outcomes, including time-to-flight-lead and absorption throughput, remain limited under current fighter inventory conditions. Interview findings indicated that assignment location, institutional distrust, and uncertainty about how specialized career tracks fit within traditional career norms are the primary barriers to implementation, while stability, control, and flexibility are central to voluntary uptake.

Collectively, these findings show that fighter pilot retention and absorption are shaped by the interaction of personnel policy, assignment systems, career incentives, and operational demands rather than by any single reform in isolation. This dissertation contributes a framework for evaluating alternative aviator career paths not only by participation rates, but also by their ability to preserve critical experience and reduce strain on operational squadrons. Policy recommendations include prioritizing assignment stability and location preference, tailoring incentives to different career-stage populations, and designing specialized career tracks as credible and professionally legitimate pathways supported by clear developmental opportunities.

Dedication

"*If I have seen further, it is by standing on the shoulders of giants."*
- *Sir Issac Newton*

For my giants: Mom & Dad.

Acknowledgments

As I sit on the Marina Del Rey steps at sunset writing this section, I feel a profound sense of gratitude for this extraordinary experience and all the people that made it possible. They say you are only as strong as your village, and I am incredibly grateful for mine. Since I will inevitably forget someone, let me start with a huge thank you to anyone who has interacted with me or my research these past three years.

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Abbreviations

ACC	Air Combat Command
ACE	Agile Combat Employment
ADSC	Active-Duty Service Commitment
AETC	Air Education and Training Command
AFI	Air Force Instruction
AFMAN	Air Force Manual
AFPC	Air Force Personnel Center
AFROGEN	Air Force - Force Generation
AFSC	Air Force Specialty Code
API	Aircrew Position Indicator
AvB	Aviation Bonus
AvIP	Aviation Incentive Pay
A3TF	Air Crew Task Force
BMC	Basic Mission Capable
BRS	Blended Retirement System
CAF	Combat Air Force
CAIP	Continuous Assignment in Place
CCR	Cumulative Continuation Rate
CIP	Career Intermission Program
CMR	Combat Mission Ready
CYOS	Commissioned Years of Service
DAF	Department of the Air Force
DAFI	Department of the Air Force Instruction
DAFMAN	Department of the Air Force Manual
DPMI	Demonstration Program Monetary Incentive
DPAP	Demonstration Program Assignment of Preference

ACC	Air Combat Command
EXP	Experienced (pilot qualification/status)
FAIP	First Assignment Instructor Pilot
FGO	Field Grade Officer
FLUG	Four-ship Flight Lead Upgrade
FHP	Flying Hour Program
FTU	Formal Training Unit
FY	Fiscal Year
IDE	Intermediate Developmental Education
INX	Inexperienced (pilot qualification/status)
IP	Instructor Pilot
IPUG	Instructor Pilot Upgrade
LOX	Letter of X's
MAJCOM	Major Command
MDS	Mission Design Series
MQT	Mission Qualification Training
OG	Operations Group
Ops	Operational
PCS	Permanent Change of Station
PIT	Pilot Instructor Training
PMAI	Primary Mission Aircraft Inventory
RAP	Ready Aircrew Program
RMD	Rated Management Directive
RTM	RAP Tasking Memorandum
SDE	Senior Developmental Education
SEAD	Suppression of Enemy Air Defenses
SME	Subject Matter Expert
TDY	Temporary Duty

ACC	Air Combat Command
TFI	Total Force Initiative
TOS	Time on Station
TTFL	Time to Flight Lead
UPT	Undergraduate Pilot Training
USAF	United States Air Force
VML	Vulnerable-to-Move List

Executive Summary

This research is a modest contribution to the extensive literation on pilot shortages, aircrew management, and military personnel policy. Its' primary contribution is twofold. First, it develops a dynamic, stochastic, Python simulation model to represent aircraft community level dynamics. The model provides a tool for analyzing the enterprise-level effects of policy changes. Second, it emphasizes that the figures represented in cost-benefit analyses are not institutional data points, but real people with individual motivations and preferences. Effective personnel policy must account for these individuals.

Problem Statement

Operational squadrons remained constrained by a shortage of experienced aviators, particularly instructor-qualified pilots. These experienced pilots are also the same personnel most heavily tasked to support training units, fill staff billets, and meet other non-operational requirements. In addition, these pilots are nearing the career point at which separation is feasible and attractive. As a result, the Department of the Air Force (DAF) faces a compounding problem: the very cohorts most essential to sustaining absorption and operational readiness is also the most difficult cohort to retain.

Recent reforms have focused heavily on increasing production, but production gains alone cannot resolve a force-generation problem constrained by limited experience and instructor capacity downstream. Without sufficient retention of instructor-grade aviators, increasing the number of pilots entering the system risks intensifying the burden on operational squadrons rather than relieving it. In this sense, the fighter pilot shortage is not merely an inventory problem, but an experience-distribution one.

This dissertation seeks to examine whether alternative instructor career paths could reduce pressure on operational squadrons by preserving experienced aviators within training environments rather than repeatedly sourcing them from the operational force. It also seeks to understand the implementation challenge such policies face in the current operational environment.

Approach

This dissertation uses a mixed-methods research design combining a dynamic, Stochastic Python simulation model of fighter-community personnel flows and absorption dynamics with semi-structured interviews.

The qualitative component draws on interviews with combat air force (CAF) instructor pilots and first-assignment instructor pilots to identify factors shaping willingness to participate in

alternative career paths, likely barriers to implementation, and difference in preferences across career stages. The quantitative component evaluates the effects of alternative instructor career paths on operational experience mix, time to flight lead, and yearly absorption throughput. Three policy excursions are tested against a validated baseline: an end-of-ADSC instructor track, a career-AETC track, and a combined implementation of the two.

Together, these methods assess both the structural effects of alternative personnel policies and the human factors that shape whether such policies are likely to succeed in practice.

Key Findings

- **Alternative instructor career paths modestly improve experience levels** and near-term improvements in absorption outcomes remain limited.
- **Modeling efforts likely understate the broader value of retaining experienced aviators** because it does not include the second order effects such as workload distribution and burnout reduction.
- **Perceived emphasis on production over retention is seen as counterproductive;** increasing new pilot output without retaining experienced aircrew intensifies operational challenges in squadrons.
- **Assignment location, distrust in the personnel system, and embedded career norms** are the largest barriers to policy implementation and uptake.
- **Different career-stages respond to different incentives**: stability, control and flexibility matter more than compensation in mid-career aviators, while modest compensation and career progression matter more to early-career aviators.

Key Recommendations

- **Prioritize quality-of-life and assignment-control features in future retention policies**; findings suggest these features are more effective than compensation alone.
- **Make assignment location a central design feature not an implementation detail.**
- **Design policies that address the root of the problem**: open alternative career paths to operational units, not only formal training unit (FTU) and undergraduate pilot training (UPT) positions.
- **Evaluate policy success by retained critical experience, not only aggregate take rates**.
- **Build credibility through contractual clarity, consistent implementation, and visible professional guardrails.**

- **Incorporate target-population needs into policy design to reduce avoidable implementation barriers;** not all aviator cohorts respond equally to similar incentives.

Chapter 1. Introduction

This research makes a modest contribution to the extensive literature on pilot shortages, aircrew management, and Department of the Air Force (DAF) personnel policy. Specifically, it examines these issues through a retention-focused lens. To better understand this research contextually requires a brief introduction to the interactions of retention with the broader DAF aircrew system.

DAF Pilot Pipeline

The pilot management system consists of three stages: production, absorption, and retention. Production refers to the process by which newly commissioned second lieutenants, as well as early-career transferred personnel, successfully complete approximately two to three years of introductory, undergraduate and graduate flying training. Absorption, also known as seasoning, is the time when a new pilot gains experience flying; this begins once a pilot finishes training in both undergraduate pilot training and formal training for their operational major weapons system (MWS). At that stage, the pilot should be capable of operating the specific mission design series (MDS), which is a variant of the MWS[1], platform at a basic level. Through absorption, the inexperienced pilots progresses to a mission and combat qualified pilot. Although the formal designation of an absorbed pilot varies across airframes, it is generally associated with the distinction, "experienced". This research adopts the combat fighter community definition: a pilot is considered absorbed/experienced upon completion of the 4-ship flight lead upgrade syllabus. Retention constitutes the final stage of the pilot management system and refers to the policies and institutional mechanisms the Air Force uses to manage an adequate pool of experienced aviators. This is to ensure a sufficiently sized pilot force to meet operation, training, and staff requirements.

Although distinct, the stages are interdependent. Production produces pilots to directly feed into the operational units to be absorbed. Production and absorption both require experienced pilots to assist in training, thereby relying on the AF to retain a sufficient number of experienced pilots. Separate guidelines and policies set production quotas and for the purposes of this research, neither absorption nor retention affect those quotas. Simply, changes to retention and absorption do not influence production quotas in this research. The following chapters explore each stage in greater depth. This research focuses primarily on retention; however, by the nature of the system, it also necessarily addresses absorption, while only briefly introducing changes in

[1] For example, the F-16 is an MDS that is within the fighter MWS category.

and the importance of the production stage. Figure 1.1 depicts the flow of influence within the system for my research.

Figure 1.1: The Air Force Pilot Management System (Simplified)



Policy Context: The Fighter Pilot Shortage

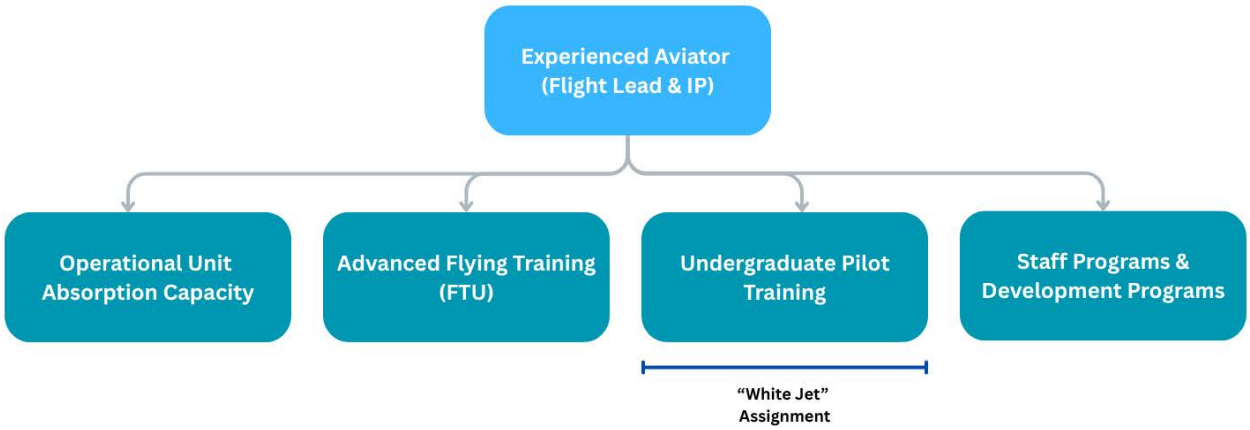
Within this broader system context, as the Air Force faces an enduring fighter pilot shortage, efforts to influence the fighter pilot management system historically include adjustments to production quotas and mechanisms, as well as retention initiatives (Penney, 2025). Changes in production affect the overall number of pilots entering the system, while retention initiatives shape absorption outcomes more directly. Because these stages are interdependent, initiatives in one stage should drive complimentary adjustments in the others to ensure an efficient and seamless flow through the system. For example, increasing production without improving retention can inhibit the Air Force's ability to produce and absorb new pilots, thereby further constraining the system.

Against this backdrop, this research aims to understand how Air Force policymakers can effectively balance these three stages and the changes within them to produce the most effective and efficient force generation and sustainment plans. Although Department of the Air Force personnel policy applies across the broader active-duty force, this study focuses on personnel policies applicable to aviators, and more narrowly, to combat aviators. Among this group, instructor pilots feature prominently as they play a key role in both force generation and squadron-level training capacity.

Conceptual Framework

This study's conceptual framework is grounded in theory related to the many roles experienced aviators, and more specifically instructor pilots, serve in squadrons. While the following chapters discuss the details of these roles, Figure 1.2 provides a brief introduction to the demand for this population.

Figure 1.2: Institutional Demand for Experienced Aviators (Simplified)

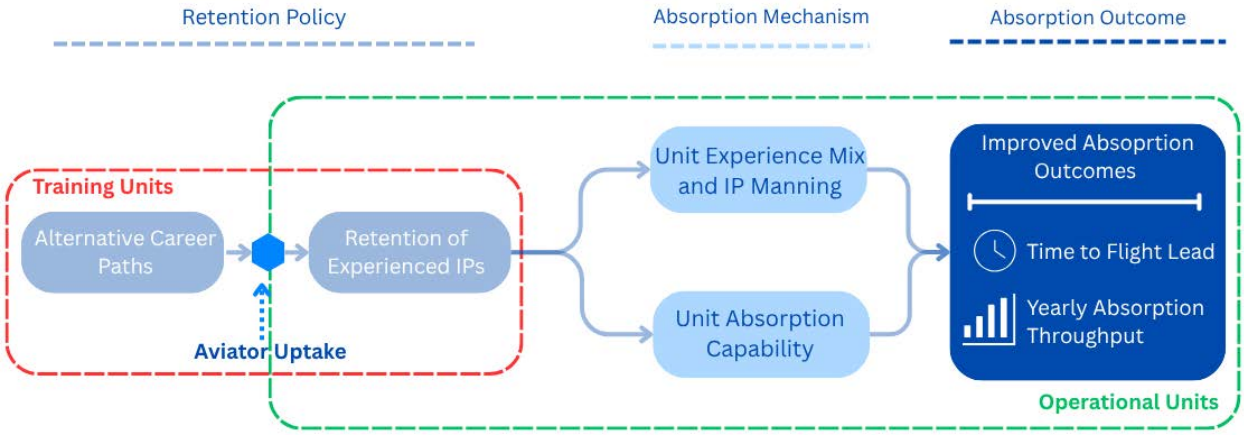


The demand that both operational and training squadrons place on instructor pilots to support the absorption and production stages makes them a particularly critical population. Because instructor pilots play an integral role in a unit's training, upgrade, and qualification functions, they have a disproportionate effect on absorption capacity. More succinctly, they drive the unit's ability to train and experience new pilots. Additionally, due to the initial active-duty service commitment (ADSC), pilots who are eligible to separate are often the same aviators in highest demand, as they are among the most qualified and experienced personnel in the force.

The central expectation follows that if the DAF were able to retain a greater share of these experienced pilots within operational units, the primary outcome would likely influence unit training capacity and experience levels in addition to the aggregate number of pilots in the inventory. Therefore, absorption is a meaningful outcome measure of retention-policy effectiveness. Accordingly, this study addresses the effects of retention policy through the following absorption-related outcomes: (1) time to flight lead (TTFL), or the number of months it takes for a newly graduated formal training unit (FTU) student to complete the 4-ship flight-lead upgrade (FLUG) and, (2) yearly absorption output, or the average number of experienced pilots produced by a squadron each year.

This logic leads to the central theory of this research: altering how and in which positions aviators serve may positively affect the retention of experienced personnel, thereby improving unit experience levels and increasing absorption capacity. Figure 1.3 presents the study's conceptual framework and depicts this expected causal pathway.

Figure 1.3: Conceptual Framework



Alternative career paths for instructor pilots, implemented as retention policies within training units, are hypothesized to drive improvements in operational experience levels. The framework begins with the introduction of these career paths, which are designed to enhance the retention of experienced pilots by offering them extended assignments in training units. This retention in training units should directly lower the number of experienced pilots that operational units must source. These experienced pilots may then stay in operational units and directly influence two critical absorption mechanisms in the unit: the overall unit experience mix and instructor pilot (IP) manning. These mechanisms, in turn, are expected to yield improved readiness outcomes, specifically by increasing the unit absorption capacity.

Alternative Career Paths

This conceptual framework suggests personnel policies capable of preserving experienced pilots within operational squadrons may improve absorption outcomes. This research examines two alternative aviator career paths as potential retention drivers. The first, currently under consideration at Headquarters, Department of the Air Force (HQ DAF/A3), is derived from an Intent-to-Establish memorandum. The second was developed for this study to examine whether retention policy can be designed to more effectively influence absorption mechanisms. Although the two alternative career paths are described in greater detail later, both are intended to reduce a longstanding requirement for combat units to fill positions in the training units. The first career path targets positions at both the Formal Training Unit (FTU) and Undergraduate Pilot Training (UPT), while the second targets positions only at UPT.

Specifically, the first career path is intended to improve retention among pilots by offering extended assignments at training bases, thereby reducing the recurring requirement for combat units to source personnel for those assignments. It therefore functions as a direct retention policy, as it targets the population the Air Force must retain, while also addressing some of the

assignment-related burdens and pressures that contribute to attrition. By contrast, the second career path reduces that same sourcing requirement by assigning new pilots to career positions at UPT. It thus functions as an indirect retention policy by reducing the demand on experienced pilots within operational units rather than targeting them directly. Subsequent chapters detail the specifics of each career path.

Research Questions

Building on this conceptual framework, this research was guided by four primary empirical research questions. Collectively these questions seek to advance understanding of how the DAF can design and implement personnel policies that improve both personal and operational outcomes. Within that broader area of inquiry, the following questions structure to analysis presented in this study:

1. What are the impacts of offering alternative instructor career paths have on operational unit experience levels and absorption related outcomes?
2. What factors influence pilots' willingness to participate in alternative career paths?
3. How do these factors differ between early-career and mid-career officers?
4. What are the most likely barriers to implementation and uptake rates?

Hypotheses

From these questions, the study aims to validate the following hypotheses:

1. If implemented using only the current fighter inventory, the proposed end-of-ADSC instructor track may produce limited near-term improvements in operational experience levels.
2. If a career-AETC track is established using a dedicated UPT-sourced instructor cohort, operational units could see larger improvements in experience levels.
3. Different grade-cohorts may respond to different incentives; one-size fits all policy design may underperform.
    a. Geographic location may emerge as a common frustration among the two cohorts.
4. Personnel policies designed with user-informed, personnel-centered features may have better uptake and fewer implementation barriers.

Methodological Overview

To examine these questions and test these hypotheses, I employed a mixed-methods research design. I developed a Python-based community-level absorption simulation model and conducted semi-structured interviews with combat pilots and early-career instructor pilots. The interviews provided insight into the current state of the problem as experienced by individuals within the system, offered detailed information on the interdependence of retention and

absorption, and identified both barriers to and recommendations for the successful implementation of alternative career paths. The interviews also informed key elements of the model, including proxies for participation rates across the different career paths and validation of sortie-hours assumptions and sortie mission composition. The model, in turn, evaluated these career paths as retention policies by comparing their effects on absorption outcomes against a subject matter expert (SME) validated baseline scenario. Because raw retention figures alone do not adequately capture operational output, the model also evaluates retention policies through their effects on a unit's ability to absorb new pilots while maintaining combat readiness.

Organization of the Study

This dissertation is presented in the following seven chapters. Chapter 2 situates the study within the broader context of the Air Force pilot shortage and the fighter pilot management system. Chapter 3 outlines the purpose of the mixed-methods research design before explaining the simulation model design choices. Chapter 4 presents the model implementation, policy excursions, and quantitative findings. Chapters 5 and 6 highlight the interview methodology and present the interview findings from CAF instructor pilots and first-assignment instructor pilots. Chapter 7 integrates findings across methods, considers their implications, and discusses the study's principal limitations. Chapter 8 concludes with a summary of findings, an assessment of the hypotheses, and recommendations for policy and future research.

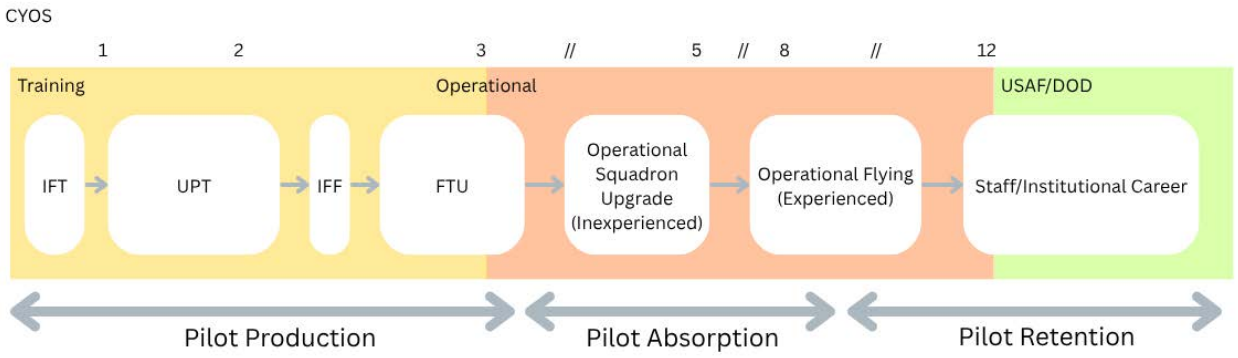
Chapter 2. The Air Force Pilot Shortage

In 2024, the United States Air Force faced a shortage of 1,850 pilots across all platforms (Penney, 2025b). This number remains relatively stable over the past few years, with more than half of these unfilled billets coming from the fighter community. With 1,142 empty fighter billets in 2024 (Decker, 2025), the Air Force struggles to produce and retain combat aviators. This is not a new challenge. Over the past 20 years, the Air Force pilot production pipeline has exhibited a notable inability to meet maintenance, personnel, and mission objectives. The current shortage stems from a multitude of sources: historical manning cuts, constrained production pipeline, insufficient absorption, and an inability to retain sufficient experienced talent. Each of these sources presents its own set of challenges but, this research focuses on the steadily declining retention and its effect on the broader pilot shortage (Penney, 2025b). While the ability to produce pilots directly affects the total number of filled billets, the operational consequences of these shortages are especially visible in the absorption and retention problems that follow. Understanding the persistent pilot shortage the Air Force has seen over the past 20 years requires an understanding of the lifecycle of a pilot; from commissioning to undergraduate pilot training completion, and beyond, there are multiple bottlenecks in the production of mission capable wingman.

The Pilot Management System

There are several stages in the production of a USAF pilot. Figure 2.1 provides a visual description of the lifecycle of an Air Force Pilot described below.

Figure 2.1: The Lifecyle of an Air Force Pilot



Production

Every officer enters through one of three commissioning sources: the United States Air Force Academy, an undergraduate Reserve Officer Training Corps' detachment, or Officer Training School. From these commissioning sources, the Air Force Personnel Center (AFPC) allocates yearly billets for a range of Air Force Specialty Codes (AFSC), 92T0 being the pilot trainee designation (AFPC, 2023). These pilot trainees propagate to one of four pilot training bases to complete undergraduate pilot training. Completion of UPT results in award of a pilot rating, assignment to a specific aircraft platform, and transition into the 11x Pilot AFSC.

UPT

Pilot trainees begin with initial pilot training in commercial aircraft to learn the fundamentals of flight. Upon completion of this initial flight training, student pilots move to the T-6, where they receive military flight instruction and develop basic airmanship skills. After the T-6 phase, students branch into follow-on training based on training platform assignment and Air Force mission needs. Historically, students either continued into the T-38C for fighter/bomber training or the T-1 for mobility and cargo training.[2] Upon completion of their final training-aircraft syllabus, student pilots are awarded their wings and proceed to formal training units for follow-on instruction in their assigned weapon system.

FTU

After completion of UPT, pilots move into formal training units that serve as an introduction to their primary MDS. Varying in length, the purpose of the FTU is much like UPT: to teach new pilots the basics of flying new aircraft. Because of the demand placed on FTUs to pump students through at a fast pace and the ramped production out of UPT, the FTUs leave the seasoning beyond basic employment skills to the operational units. At the completion of FTU, it is understood that a graduate will have the necessary skills to safely operate their primary MDS.

FTU marks the end of the formal training of student pilots. From this point forward they leave the production pipeline enter the operational Air Force as inexperienced pilots and join the absorption pipeline.

Absorption

Absorption refers to the stage of the pilot lifecycle in which newly assigned pilots gain enough experience within the operational unit to perform combat missions effectively. Numerically, absorption capacity is the number of inexperienced pilots a unit can accept each year while maintaining an appropriate experience mix to season these inexperienced pilots. The unit must balance preserving combat capability with developing new pilots in a timely manner

[2] The Air Force has phased out the T-1 mobility trainer. Students now leave UPT for FTU in these communities after completing the T-6 portion of UPT (Losey, 2025).

(AFI 11-412, 2019). Absorption, as a process, turns inexperienced pilots into experienced pilots (Marken et al., 2007).

Retention

The final stage of the pilot lifecycle is retention. After completing training and upgrade requirements, pilots are finally in a position to contribute their accumulated skills and experience either operationally or in a training capacity. Shortly after, they face the first major inflection point of their careers: whether to continue with their military service, or separate. Pilots must now weigh continued service against a range of alternatives available to highly qualified aviators. Alternatives include affiliating with the National Guard or Air Force Reserves or separating from military service entirely. Because pilots incur a 10-year ADSC upon completion of UPT, this decision usually occurs around 10-12 continued years of service (CYOS) (DAFMAN 36-2100, 2026). By then, many pilots have reached the rank of major, accumulated roughly 1000-1500 MDS flying hours, and have often earned the qualification of instructor pilot (McGee, 2015). In short, pilots reaching this separation point are highly experienced and well-qualified for aviation careers both outside active duty and/or in the commercial aviation industry.

Production Reform and Its' Downstream Limits

The Air Force has consistently fallen short of its stated goal of 1500 new pilots per year. In 2022, the Air Force produced 1,276 pilots, roughly 20% short of its annual target (Allvin, 2023a). To address this deficit, DAF instituted a massive overhaul of the UPT program with goals of increasing throughput and reducing training times. These changes affect syllabi lengths, civilian contract support, training aircraft type, and the student flying hours required.

UPT and Recent Production Reforms

Since 2022, DAF has implemented several UPT reforms focused on increasing throughput and reducing delays in the production pipeline. Major changes include shifting portions of initial flight instruction to civilian partners, eliminating the T-1 from the training pipeline, and consolidating fighter-specific follow-on training requirements (Tirpak, 2025). Collectively, these reforms aim to move students through UPT quicker, reduce breaks-in-training[3], and ease pressure on aging training aircraft and limited instructor capacity.

Increased production at UPT, however, does not by itself resolve the broader pilot shortage. If FTUs cannot absorb the increased flow of graduates or operational units cannot absorb the increased throughput, the overall pipeline remains constrained. Changes in UPT production and

[3] Breaks in training occur between UPT and FTU, and sometimes between FTU and a pilot's first operational assignment, when there are not enough aircraft or instructors available to accommodate all graduating pilots.

the resulting demand for increased FTU throughput and absorption have therefore driven additional reforms downstream.

FTUs as Transitional Units

In contrast to the sweeping changes implemented in undergraduate pilot training over the past several years, FTUs have seen comparatively limited reform. The most notable adjustment has been the reduction of syllabi to the minimum number of sorties required for safe aircraft operation, with mission-specific and combat-proficiency training increasingly deferred to operational units. FTUs have also expanded the use of simulator-based instruction to supplement live sorties, driven by limited instructor availability and continued strain on the DAF's aging aircraft fleet (Pawlyk, 2021).

The intended effect of shorter syllabi and greater reliance on simulator training is to increase throughput of FTU graduates to operational units despite resource constraints persistent at the FTUs. While these changes may improve flow through the FTU, they also shift some of the training burdens to operational squadrons. Operational units, already constrained by limited resources and imbalanced manning experience levels, are receiving less experienced personnel, further increasing the burden on those units.

Downstream Bottlenecks

Ultimately, improvements in pilot production are only as effective as the rest of the lifecycle pipeline's ability to absorb those graduates into operational units. Gains at the front end of the pipeline may simply create a backup in the system if the operational squadrons are unable to keep pace.

To understand why shortages persist, even when production rises, it is first necessary to examine absorption.

Absorption – The Central Operational Bottleneck

As mentioned previously, the absorption process is the ability to turn inexperienced pilots into experienced pilots. In practical terms, absorption is measured by the number of inexperienced pilots a unit can accept each year while maintaining an appropriate experience mix, preserving combat capability, and developing new aviators in a timely manner. To be effective, a squadron must balance three competing demands: executing mission training sorties, developing inexperienced wingmen through upgrade and seasoning sorties, and avoiding burnout among experienced pilots.

Because absorption is shaped by MDS-specific upgrade requirements and training pipelines, the process differs across aircraft communities. However, the underlying tension between resource demands and resources available exists across all platforms. The following example

illustrates the specific absorption timeline in the F-16 community before turning to a broader explanation of resource constraints across the enterprise. [4]

Absorption in Practice: The F-16 Upgrade Pipeline

Within the F-16 community, upon FTU graduation and arrival at an operational (Ops) unit, a new pilot immediately enters the upgrade and absorption pipeline through mission qualification training (MQT). Each new pilot has 90 days to complete the MQT upgrade before requiring a waiver from the wing commander. (AFMAN 11-2F-16, 2022). After MQT, pilots are considered mission-ready wingman in the squadron and spend the next 2-3 years gaining experience before entering their next upgrade, the four-ship flight lead upgrade (FLUG). Upon completion of FLUG, they are considered experienced and no longer only consume resources in the absorption pipeline. Once experienced, pilots may fly without supervision and provide support for inexperienced sorties. After at least a year as flight lead, they are eligible to enter the instructor pilot upgrade, where they finally become the most essential member of the squadron instructor pilots provide support, supervision, and training without draining resources for their own seasoning. This dynamic is further explained later in this chapter.

Throughout this timeline, an F-16 pilot flies sorties both for upgrade requirements and continuation training. During any active upgrade, those sorties must be supervised and evaluated by instructor pilots. Additionally, while a pilot remains a wingman, their sorties must be accompanied by an experienced member of the squadron. This introduces the inherent importance of maintaining a healthy balance of experienced to inexperienced members in the squadron.

Experience Ratio, Ready Aircrew Program (RAP) Minimum, and Training Inefficiency

Because the fighter pilot inventory is shaped by a continuously flowing pipeline of accessions and separations, squadron health depends on maintaining a stable balance between experienced and inexperienced pilots. This balance is necessary to keep both upgrade and continuation training moving at a sustainable pace.

Ready Aircrew Program

The Air Force does not struggle with understanding how absorption works or the balance of aviators it needs to sustain healthy absorption; the challenge lies in resource constraints. The resource necessary to fuel the absorption engine is sortie generation capability; which in turn is fueled by manpower and aircraft.[5] Aircraft-wise, the DAF deals with an aging fleet where most

[4] The quantitative model of this dissertation is based off the F-16 community because of its access to data and historical prevalence. Therefore, all examples will help frame the problem in the context of research methods used.

[5] For a detailed description of the mathematical equation behind a squadron's absorption capacity, see Lara 2023.

aircraft have well below the 80% aircraft availability rate[6] the service identifies as healthy (Decker, 2025); the fighter community is currently posting a 60% aircraft availability rate (724 operational aircraft out of 1206 inventory) (Decker, 2025). Compounding the sortie generation issue from a limited and aging fleet is a personnel shortage. Pilots arriving from FTU often take between 2-3 years to gain the seasoning necessary to become experienced. During this stage, units depend on the retention of experienced aviators, many of whom are nearing the end of their initial ADSC and are fatigued by increased responsibilities and the high operational tempo associated with personnel shortfalls.

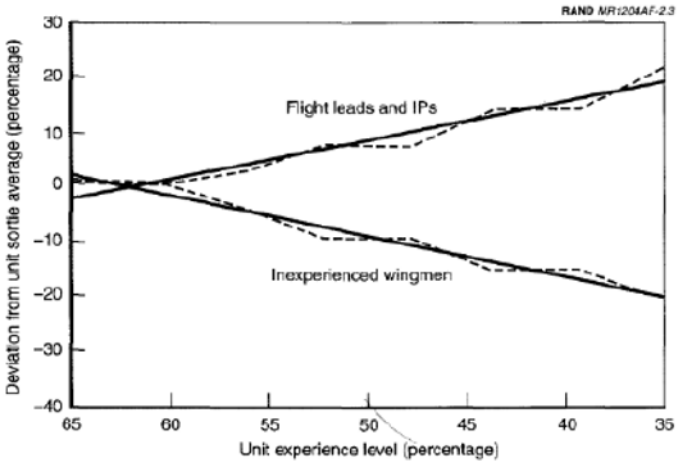
In practice, the absorption process is governed not only by squadron staffing rates and aircraft availability, but also by formal continuation training requirements that determine how available sorties should be distributed. The governing policy for combat pilot continuation training is the Ready Aircrew Program (RAP). The AF uses RAP sortie requirements to build annual flying-hour program budgets driven by established readiness standards for combat units (U.S. GAO, 2020). While MDS dependent, RAP specifies the quantity and frequency of required training events, including both live and simulator sorties, pilots must complete to maintain minimum mission-ready standards. These requirements are divided between experienced and inexperienced aircrew and therefore provide a high-level blueprint for how sorties should be allocated within a unit. More importantly, RAP places greater sortie demands on inexperienced pilots than on experienced. For example, in the F-16 community, inexperienced pilots require nine flying sorties each month while experienced pilots are only required to fly eight (ACC, 2025). As a result, a unit's ability to meet RAP requirements depends heavily on maintaining an experience mix that allows those sorties to be distributed efficiently.

Experience Mix and "Pope Syndrome"

At the 1999 Four-Star Rated Summit, senior Air Force leaders raised the unit experience objective from 50% to 55%. By the 2001 summit, however, the mismatch between production goals and force structure had become severe enough that 45% was adopted as an acceptable minimum (Taylor, Bigelow, and Ausink, 2009). RAND's analysis in the early 2000s found that the effective balance for sustaining upgrade throughput while meeting RAP minimums was closer to a 60/40 experienced-inexperienced ratio (Taylor, Moore, Roll, 2000). Figure 2.2 illustrates this inflection point, below which training efficiency deteriorates rapidly. This phenomenon is often referred to as "Pope syndrome," a reference to the conditions observed in A-10 units at Pope Air Force Base in 2000. Overmanning and a low ratio of experienced-to-inexperienced pilots led to degraded training and readiness (Taylor, Bigelow, and Ausink, 2009).

[6] Represents primary aircraft available to Ops to execute daily flying hour requirements; aircraft must be mission capable. It is a variable requirement that will fluctuate on any given day/week (AETCI 21-105, 2024).

Figure 2.2: Share of Sorties at Different Experience Ratios



SOURCE: Reproduced from Figure 2.3 of Taylor, Moore, and Roll (2000).

Although HQ DAF directs that wingmen should receive more sorties than experienced aircrew under RAP minimums, that guidance becomes increasingly unachievable as the experience mix deteriorates (ACC, 2025). Below the 60% threshold, flight leads and instructor pilots must shoulder a rapidly growing share of the units flying simply to fill the required supervisory roles in seasoning inexperienced pilots. Instructor pilots, in particular, oversee all upgrade sorties and all continuation sorties for pilots who have not completed their MQT training. In addition, all wingmen must fly under the supervision of either a flight lead or an instructor pilot. As a result, experienced aviators devote more of their flying to oversight of inexperienced pilots at the expense of their own upgrades and continuation training. The unit may still be flying, but the training system is no longer operating efficiently or at RAP standards. This dynamic causes the system to break down once a squadron falls below the 60% experience threshold, as depicted in Figure 2.2.

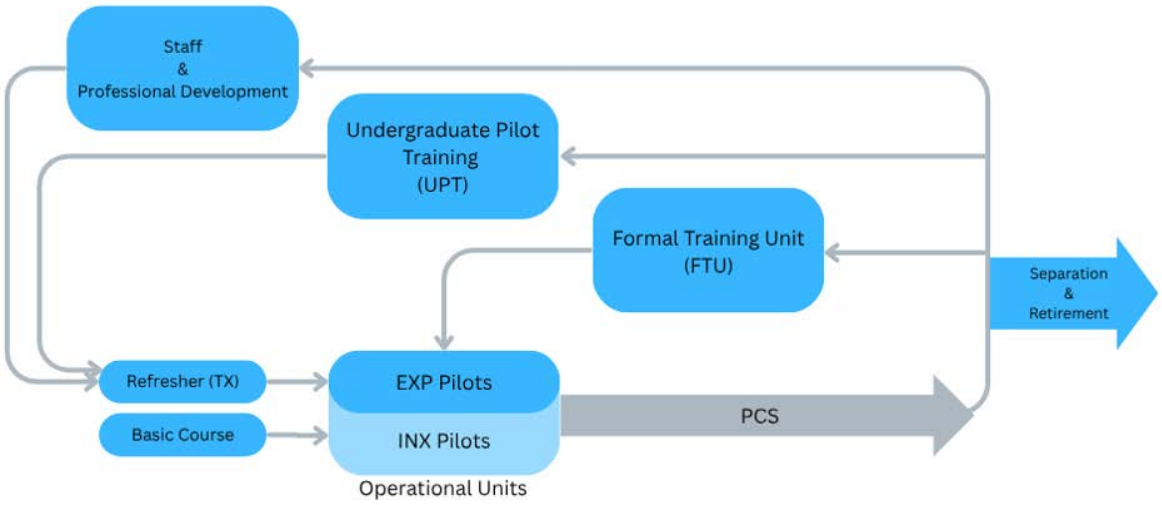
The Many Roles of an IP

Instructor pilots occupy a uniquely important position in maintaining a healthy squadron experience mix because they are the primary mechanism for developing inexperienced aviators into experienced ones. While all experienced line pilots contribute to squadron performance through sortie support, supervision, and administrative responsibilities, IPs carry the heaviest load for sustaining absorption capacity. At the same time, the qualifications and experience that make them essential to the squadron training also make them the primary candidate pool for leadership positions, headquarters staff assignments, non-flying joint billets, and IPs for training units (i.e. UPT and FTU). As a result, the same small group of highly experienced aviators is tasked with filling both operation and institutional demands.

These requirements to fill non-line unit positions such as FTU and UPT instructors, weapons and test school students and instructors, HQ DAF staff positions, and interceptor squadron assignments stretch experienced pilots thin both operationally and institutionally. These non-CAF positions have fill rate goals specified by the rated management directive (RMD). The latter three positions require the IP qualification. While IP qualification is preferred, FTU and UPT instructor billets currently rely on 4-ship flight leads because of the pilot shortage guiding this research (Allvin, 2025). Regardless of when they are assigned to fill these non-line unit positions, the end state is the same: fewer experienced personnel remain either on the pathway to absorption or in positions directly supporting it.

IPs assigned at the end of their second assignment are the most valuable and critical members to the squadrons' mission and yet will spend the rest of their ADSC furthering different mission objectives. Fundamentally, there are too many roles requiring these qualifications, and too few pilots to fill them.

Figure 2.3: Institutional Demands for Experienced Pilots, Expanded



SOURCE: Adapted from Figure 2.1 of Taylor, Moore, and Roll (2000).

Figure 2.3 provides a visual representation of the multiple roles experienced aviators must support over the length of their careers, while also highlighting the central bottleneck in increasing squadron experience levels: squadrons operate as a self-feeding mechanism.

Inexperienced aviators require experienced pilots to train, supervise, and develop them through the entire production and absorption pipeline. Once those aviators cross the threshold to experienced, they in turn become the support apparatus that enables future production and absorption. The only mechanism DAF has to increase experience is through an absorption process that is itself constrained by existing experience. At the same time, the service draws from

this same pool to fill leadership, staff, and other training positions, further amplifying the importance of IPs.

If absorption depends on experienced aviators, then the retention of those aviators becomes a critical experience constraint.

Retention – A Critical Experience Constraint

Why Pilots Leave.

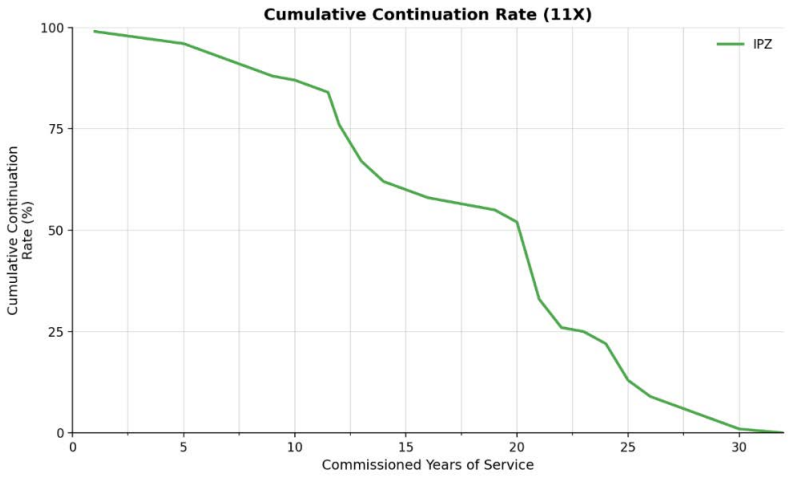
The reasons pilots choose to leave active service are diverse. However, in a Senate confirmation hearing, General Allvin cited the 2023 Aircrew engagement survey with the top three reasons pilots leave the air force after initial ADSC as lack of a stable home life, compensation, and duties that take away from flying – "pilots like to fly" (Hadley, 2023b). While the Air Force has made efforts to alleviate all three concerns, outside opportunities, especially commercial airline companies, offer higher salaries and more benefits, greater stability through choice of domicile and schedule, and the opportunity to focus only on flying. Airline companies are strongly incentivized to recruit these pilots because the pool of AF trained aviators provides a ready source of highly qualified replacements for pilots retiring from the civilian sector and they can help meet the demands of the growing commercial sector. In effect, airlines can draw on this talent pool without bearing the full cost and time required to train aviators from scratch.

Retention Trends

Rated officer retention tends to follow a predictable pattern. The largest wave of losses occurs at the end of the initial service commitments with minor year fluctuations based on prior service commitments and the specific training path each pilot followed. After this initial mid-career loss, there is a slight downward trend in retention rates with the next big hit coming from the 20-year retirement eligibility mark. Newer bonus structures than the legacy 20-year model, mainly targeting CYOS 13-20, may influence positive trends in the future. But for now, most retention is easily explained using the above lifecycle. Figure 2.4 is a reproduction of Walsh et al's 2021 analysis into talent management modeling. The figure depicts the cumulative continuation rate (CCR) of the pilot career field (AFSC: 11X).[7]

[7] The CCR is the average rate of continuation throughout that year and all previous years. It is a good metric to understand the percentage of personnel who remain in uniform past specific career milestones (i.e. initial ADSC payback and the legacy 20-year retirement mark).

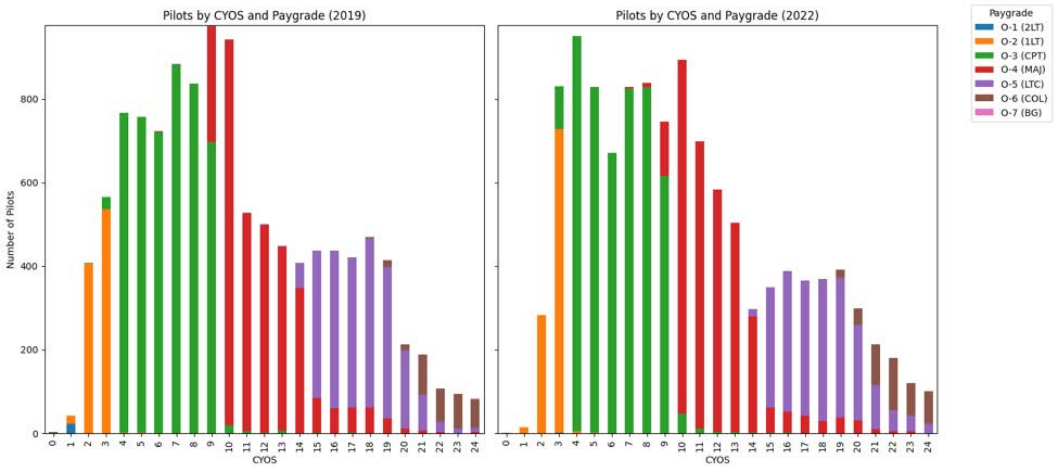
Figure 2.4: Cumulative Continuation Rate for 11X AFSC



Source: Adapted from Figure 3.4 of Walsh et al. (2021)

The research team had access to fiscal year (FY) 2005 through FY2018 data. There is one key difference in the Air Force that informed this model and today's: the COVID-19 pandemic. During the pandemic years – FY20 and FY21 – a freeze in commercial airline hiring led to a spike in retention rates among Air Force pilots (Losey, 2020a). However, when this hiring freeze ended, the resulting surge in airline recruitment cause a significant increase in Air Force pilot attrition and a subsequent rapid decline in rated officer retention (Canillas, 2026). As airline hiring rebounded following the COVID-19 pandemic, the Air Force suffered a net loss of 250 pilots, leaving it 1,900 pilots short at the end of fiscal year (FY) 2022 (Allvin, 2023a). Data from the ACC/A3T office, reproduced in Figure 2.5, illustrates the decline in manning that resulted from this hiring surge, particularly in the O-4 and O-5 cohorts.

Figure 2.5: Comparison of Pilots by CYOS and Paygrade Before and After COVID-19



The 2021 research is still a realistic view of the continuous downward trend and sharp drop offs caused by natural inflection points in the pilot lifecycle and an accurate depiction of the experience problem facing aviation communities at large. This dynamic, often referred to as "the pilot bathtub" – is characterized by a higher concentration of younger pilots, a thinning of mid-career pilots, and just enough senior pilots to fill leadership positions.

This dynamic is not new; rather, it reflects structural imbalances that date back to the post-Cold-War drawdown.

Historical and Structural Sources of Current Shortage

Post-Cold War Drawdown

Today's pilot shortage is rooted not only in current production and retention pressures, but also in force-management decisions made after the Cold War. As the perceived national security threat declined in the early 1990s, the Air Force sharply reduced both pilot requirements and pilot production (Taylor, Moore, and Roll, 2000). Between 1990 and 2000, active-duty pilot requirements fell by roughly 36%, while the active fighter aircraft inventory was cut by about half. Over the same period, annual active-duty pilot production dropped from roughly 1,500 pilots in FY 1990 to about 500 in FY 1996 (Taylor, Bigelow, and Ausink, 2009). These reductions were intended to align the force with a less demanding strategic environment, but they also significantly reduced the flow of new pilots entering the system.

In the short term, lower production relieved experienced aviators of some instructor and training burdens and improved experience levels in operational units. In the long term, however, the cuts created a severe imbalance in the pilot inventory. When demand for fighter pilots rose again in the mid-1990s and continued to grow in the decades that followed, the Air Force faced a shortage concentrated in specific year groups and grades rather than evenly across the force. This imbalance became known as the pilot "bathtub." It was an overrepresentation of more junior and senior officers, combined with a shortage of mid-career aviators in the year groups most critical for instructor roles, squadron leadership, and staff positions.

The Pilot Bathtub

The bathtub problem was reinforced by the structure of pilot ADSCs and separation patterns. Before 2000, the ADSC for the pilots affected by the force drawdown was eight years, placing the first major separation decision around 8–10 CYOS.[8] As a result, the same cohorts already reduced by post–Cold War production cuts were also the cohorts most vulnerable to separation at the point they would otherwise have become the experienced majors and instructor pilots the Air

[8] The 10-year ADSC requirement was implemented for all pilots completing UPT after October 1, 1999 (U.S. Code, Title 10, Section 653).

Force needed most. The result was a persistent dip in the middle of the force: too few pilots in the 9–15 CYOS range, even when total inventory numbers appeared healthier on paper.

While the pilot "bathtub" remains a useful way to describe the historical imbalance in pilot year groups, today's force structure increasingly looks less like a bathtub and more like a gradual decline across the career profile. Earlier force profiles showed a recovery in more senior cohorts, but today that rebound is weaker, reflecting continued difficulty in retaining experienced field-grade and senior aviators. In that sense, the traditional bathtub analogy understates the severity of the current problem. The modern force profile is less a mid-career dip followed by senior recovery and more a continuous thinning of experience, leaving the Air Force short not only of instructor-grade majors but also of the deeper bench of senior leaders needed to lead and stabilize the force over time.

Although pilot production quotas eventually increased, and continue to be altered to this day, absorbable fighter aircraft have continued to decline, and operational units have remained constrained by aircraft availability, sortie generation, and instructor pilot capacity. The Air Force therefore entered the 21st century with a dual problem: it could not produce enough pilots to meet inventory demands and ease the burden on retention of more senior pilots, yet increasing production further risked overwhelming the squadrons responsible for absorbing and developing those pilots.

Recruitment and Inventory Constraints

In addition to the institutional challenges inherited from earlier force-management decisions, the military still faces problems at the front end of the pipeline with recruitment. Today's generation has the lowest propensity to serve in the military over the last 15 years, with only 9% expressing a willingness to do so (Seyler, 2022). This decline is not fully driven by the Department of War. Rather, it is the product of a broader distrust in public institutions, fewer families with veteran family members to educate and influence their children and relatives, and a labor market saturated by private industries that often offer more attractive opportunities. At the same time, the share of the population eligible for military service has declined sharply; only 23% of young Americans are currently qualified to serve without a waiver, down from 29% in recent years (Kuzminski and Sylvester, 2025). Taken together, a smaller recruiting pool and stronger civilian alternatives means the Air Force is fighting an uphill battle to bring in enough people to sustain the force.

Retention Initiatives: Setting the Stage for Alternative Career Paths

By nature of the active-duty-service-commitment and training timelines, most aviators at the end of their initial ADSC have reached the rank of major, accumulated roughly 1,000-1,500 MDS flying hours, and often earned the qualification of instructor pilot (McGee, 2015). Pilots eligible for separation are among the most important members of the operational flying

squadrons and uniquely qualified for aviation careers outside of active duty. For these officers, the retention calculus is therefore one of comparative opportunities: whether continued service offers the most attractive use of their accumulated skills and experience. The DAF retention initiatives are binned into two groups for the purposes of this research: service wide initiatives and aviation career focused initiatives.

Recent retention efforts have seen adjustments to retirement systems that appeal to a force less motivated by the traditional 20-year service model, and more attention placed on non-monetary incentives targeting quality of service and quality of life and the shifting family dynamics of the 21st century. The introduction of alternative career paths directly correlates with this trend.

Service-Wide Retention Initiatives

The Air Force has a few long-standing benefits and incentive programs, for which all service members are eligible, aimed at retention and recruitment; to name a few: TRICARE medical benefits, Post 9-11 GI bill (education benefits), and retirement structures. The last of which has undergone the most changes since its inception.

AF Retirement Systems

The transition from the traditional retirement system to the blended retirement system in 2018 reflects the DAF's efforts to tailor its retention strategy. The legacy retirement model cliff vested at 20 years, rewarding only those who remained for a full career and thereby incentivizing long-term retention through an all or nothing structure (Argüden, 1988). By contrast, BRS introduces earlier and more flexible benefits, including government TSP contributions and continuation pay in the mid-career years. In doing so, it was designed less to hold members until retirement eligibility and more to encourage them to remain in service for several years during the period where their experience is most valuable to the Air Force (Kamarck, 2024). Although the long-term effects of BRS on officer retention remain uncertain, the program reflects an effort to retain mid-career talent without relying solely on the rigid incentives of the legacy 20-year system (Seck, 2023).

Career Intermission Program

The Career Intermission Program (CIP) represents a similar shift towards flexibility. CIP allows service members to step away from active duty for one to three years, transition temporarily to the Individual Ready Reserve, and then return to service with a one-for-one service repayment. Unlike traditional retention tools that rely primarily on compensation or long-term retirement incentives, CIP is designed to help members navigate short-term conflicts between military service and personal or professional demands without permanently leaving the Air Force (Bailey, 2017). Although the program remains of limited utility to rated communities because of the personnel shortage, it is still evidence that the DAF has become increasingly

willing to treat retention as a matter of flexibility and work-life balance rather than through compensation alone (DAFI 36-2008, 2023).

Although the above policies apply across the broader force, the DAF has also pursued retention initiatives tailored specifically to the needs of rated offers; these incentives have seen similar reform.

Aviator Focused Retention Initiatives

While all career fields are eligible for the BRS, and the legacy system depending on when they entered active duty, the Air Force specifically creates programs targeted towards career fields that are hemorrhaging experienced individuals. In the Air Force's arsenal of AFSC specific retention initiatives are aviation incentive pay (AvIP), more commonly known as flight pay, and the voluntary aviator bonus (AvB) contract.

Flight Pay

Flight pay, or aviation incentive pay (AvIP), is a monthly allowance for rated officers. AvIP increases as aircrew years of aviation service (YAS), or time spent in an active aviation-billet, increases. Table 2.1 shows the monthly flight incentive pay as a function of YAS (DoD Financial Management Regulation, 2024).

Table 2.1: Aviation Incentive Pay

Years Of Aviation Service	AvIP Monthly Payment ($) (Annual Amount, $)
2 or Less	$150 ($1,800)
>2-6	$250 ($3,000)
>6-12	$700 ($8,400)
>12-22	$1000 ($12,000)
>22-24	$700 ($8,400)
>24	$450 ($5,400)

Flight pay is an automatic entitlement for all aviators. AvB, on the other hand, is an optional program.

Aviator Retention Bonus

While all pilots are at one point eligible for the AvB, it is a voluntary contract that tacks on additional years of commitment in exchange for monetary compensation. There is flexibility and choice for the individual service members in how much money they accept, and therefore how many additional years of service they owe. However, pilots do not need to take the AvB to keep flying or to keep receiving AvIP.

The AvB has long been one of the DAF's primary pilot retention tools, offering additional service commitments in exchange for monetary compensation. Historically, the program was structured primarily as a financial incentive offered after a pilot's initial ADSC expired, with contract length and payout levels adjusted over time in response to manning conditions across aviation communities (Jamie, 2024).

AvB Changes

Beginning in FY24, however, the Air Force supplemented the traditional AvB with a new Demonstration Program that reflects a broader approach to retention (Hadley, 2023a). Unlike the legacy AvB, the Demo Program is offered only to pilots with one-two years remaining on their initial ADSC and includes both monetary and non-monetary incentives. Its monetary component (DPMI) functions similarly to the traditional bonus, while its assignment-preference component (DPAP) is designed to address one of the most frequently cited reasons pilots leave active duty: instability in home and family life (Allvin, 2023b). Through DPAP, eligible pilots may secure a preferred assignment, avoid certain locations, or remain in their current location, signaling a shift toward retention efforts that address quality of life concerns in addition to compensation.[9]

The additional changes to the FY27 bonus reinforce this shift. Next year, the Air Force is increasing the annual bonus rates for high-risk communities[10] and, for the first time, offering a flat annual payout regardless of contract length in the legacy AvB. This change makes the active-duty bonus structure more competitive with Reserve offerings, while continued offering of the Demo Program shows that the DAF increasingly views pilot retention as more complex than a monetary issue

Continuous Assignment in Place

A similar program addresses retention through assignment stability rather than direct compensation – continuous assignment in place (CAIP). Expanded in 2025, CAIP grants wing commanders at rated units the authority to retain personnel in place across multiple vulnerable to

[9] DPAP and DPMI may be taken in tandem. For more detailed explanation of the new bonus system see Appendix C.

[10] High-risk communities refer to MDS communities that are struggling to retain pilots. Currently the list includes most fighter and bomber MDS communities.

move (VML) cycles.[11] This directly provides stability and ability for service members to plan their future accordingly. By reducing the frequency of permanent change of station (PCS) moves, CAIP acknowledges that retention is shaped not only by pay, but also by the ability of service members and their family members to maintain personal and professional continuity. CAIP complements recent bonus reforms by targeting another known, and major, non-monetary source of pilot dissatisfaction.

The DAF has increasingly pursued personnel initiatives intended to improve stability, flexibility, and assignment control for its service members. Programs such as CAIP, CIP, BRS, and the Demonstration Bonus Program reflect a broader shift in retention policy toward tools that better account for changing service member preferences and quality of life concerns. Within this context, alternative career paths are best understood not as an isolated innovation, but as a part of a larger DAF effort to reconsider how experienced aviators are retained and employed across the force.

The following dissertation examines two novel alternative career paths and considers their relevance to the pilot retention problem.

Conclusion

Having established the current state of the policy problem area, the remainder of this dissertation seeks to evaluate the impact of offering alternative aviation career paths as well as the viability of implementation in the workforce.

The following chapters introduce the alternative career tracks examined, explain the mixed-methods research design, report the key findings from both methods, and finally synthesize the results for recommendations and key findings.

[11] The VML is the Air Forces way of notifying personnel they are up for PCS. Removal from the list guarantees the servicemember will continue at their current job and base for one more PCS cycle.

Chapter 3. Simulation Model Design

This study employs a mixed-methods research design using a Python-based Simulation model and semi-structured qualitative interviews to examine the implications of two alternative career paths for instructor pilots.

Two Alternative Career Paths for Consideration

Having established the central role of instructor pilots in the absorption process, as well as the retention pressures affecting that population, the proposed career paths are intended to alleviate burdens identified in the preceding sections through two distinct approaches. The first seeks to create a stable cohort of instructors at training bases drawn from the current fighter pilot population. The second seeks to build a similar cohort by directing newly trained pilots into that role earlier in their careers. Both career paths are grounded in the conceptual framework outlined in Chapter 1.

Policy 1 – Overview

The first policy examined in this study is referred to interchangeably as *Policy 1* or the *End-of-ADSC Instructor Track*. This career track is currently under development and implementation through the AF/A3T office in HQ DAF/A3. Based on access to an intent-to-establish memorandum, the policy targets training units with the aim of building a stable cadre of instructors at UPT and FTU locations that are less reliant on the traditional PCS cycle (Contreras, 2025). The program offers a six-year ADSC in exchange for assignments as a dedicated instructor at UPT or FTU. The policy also allows for two-year extensions beyond the initial six-year commitment.

The memorandum also indicates an intention to preserve opportunities for deployment, staff-tour participation, and continued career progression, potentially including remote fulfillment of some non-flying requirements. The addition of these aspects demonstrates an effort on HQ DAF's part to create a career path that provides both specialization and stability while remaining compatible with broader professional development and promotion.

If implemented as intended, the memorandum labels a primary objective of the career path as "limiting the number of experienced MDS IPs being removed from line units."

Policy 2 – Overview

The second policy examined in this study, referred to as *Policy 2* or the *Career-AETC Instructor Track*, is a thought experiment on the potential operational gains of a more expansive alternative career path. Policy 2 emerged from the hypothesis that Policy 1 may involve a

significant onboarding period during which experienced aviators would still need to be pulled from operational units in order to establish the desired instructor cadre at training bases. To address this hypothesized limitation, Policy 2 considers the implications of building the cadre instead, from newly graduated student pilots rather than the operational cohort.

Under this concept, pilots would enter a dedicated instructor track much earlier in the lifecycle, instructing at UPT bases rather than first flowing into operational assignments. This career path is presented as a 10-year ADSC served entirely within Air Education and Training Command (AETC), and more specifically UPT. The policy is therefore designed to test whether the Air Force could feasibly fill training requirements without further drawing down the fighter population.

It follows naturally from Policy 1's objectives that this career track would fill the slots at UPT which currently take experienced MDS IPs from line units. In this sense, Policy 2 extends the same underlying logic as Policy 1 – reducing the need to source experienced MDS pilots from line units.

Mixed-Methods Research Advantages

The model uses historical data as inputs wherever possible in order to reflect the real system as closely as available data allow. Where historical data is unavailable, the model relies on SME validated metrics to maintain fidelity with AF processes. Methodologically, it combines an agent-based representation of individual pilots with a broader system-dynamics framework so that fluctuations in the real pipeline can be captured without conflating system inputs and outputs. By decoupling unit level inputs from individual-level outcomes, the model is designed to let the effects of scheduling, weather, manning practices, and other operational frictions emerge more naturally.

Due to resource constraints, the interview component of this research was limited to a small subset of the population of interest and should be understood as exploratory rather than comprehensive. Even so, it demonstrates that individuals want their perspectives to be heard and are willing to engage with policymakers in the process of refining personnel policy. In this mixed-methods design, the interviews inform the interpretation of policy preferences and implementation concerns, while the model evaluates how those policies may play out at the squadron and enterprise levels.

The interviews provide a supplemental measure of policy success by capturing pilots' reactions, perceived attractiveness, and implementation barriers; dimensions a model cannot directly estimate. These qualitative findings help frame the human uncertainty surrounding personnel policy, but they do not alone assess how such policies would affect absorption or readiness across the force. To address those enterprise level questions, the analysis pivots to the simulation model, which evaluates policy impacts within the more rigid structural constraints of AF assignment and training systems.

The remainder of this chapter explains the Python-based Simulation model design choices. I begin by introducing the model used to analyze the proposed career paths and then move into the parameterization and application in the subsequent chapter. After the model is explained and the results are highlighted in the following two chapters. I will walk through the semi-structured interview method and results in Chapters 5 and 6.

The Simulation Model

The following chapters highlight the design choices and parameterization inputs of a community-level absorption model that I built independently, using sample upgrade-logic from a 2023 dissertation that produced a squadron-level pilot absorption model. While my model departs substantially from the overall structure of the 2023 absorption model, it preserves the initialization framework and upgrade-probability logic from that earlier effort. That effort used probabilistic upgrade metrics and sortie-queuing logic to examine how changes to qualification requirements affect unit-level absorption.

The present research builds on that conceptual premise – that sortie distribution within a squadron can be modeled – but extends the analysis to the aircraft-community level. This scaling choice was made because the policy lever affecting absorption changed. Additionally, this scaling choice and subsequent modeling logic makes this model a novel contribution to this field of study.

Rather than examining how changes to standards shape absorption, this model is designed to evaluate how changes in personnel policy influence absorption outcomes. Since unit-level inflow and outflow dynamics depend on broader community-wide requirements, relevant policy analysis tools must also reflect those relationships. Through validation with the ACC/A3TF office, the model has evolved into a dynamic, stochastic, community-level simulation implemented in Python. It uses individual pilots' training, flying, qualification, and assignment states to produce operationally meaningful squadron and enterprise level readiness, upgrade progression, absorption, and personnel flow under alternative policy and resource conditions.

Case Selection: The F-16 Community

The model is structured as a community level-PCS and sortie-distribution simulation, with the F-16 community serving as the baseline case. The F-16 was selected for several reasons. First, it represents a mature and heavily tasked fighter community with a continuous pilot production pipeline dating to 1983, providing more than four decades of relevant personnel and training history. Second, this continuity has generated a substantial body of historical data to support model development and validation. Access to FY12-FY25 assignment data allowed the construction of historically grounded PCS probability distributions. Finally, additional access to Flying Hour Program briefs and aircraft availability rates further supported development of empirically and historically informed sortie-generation inputs.

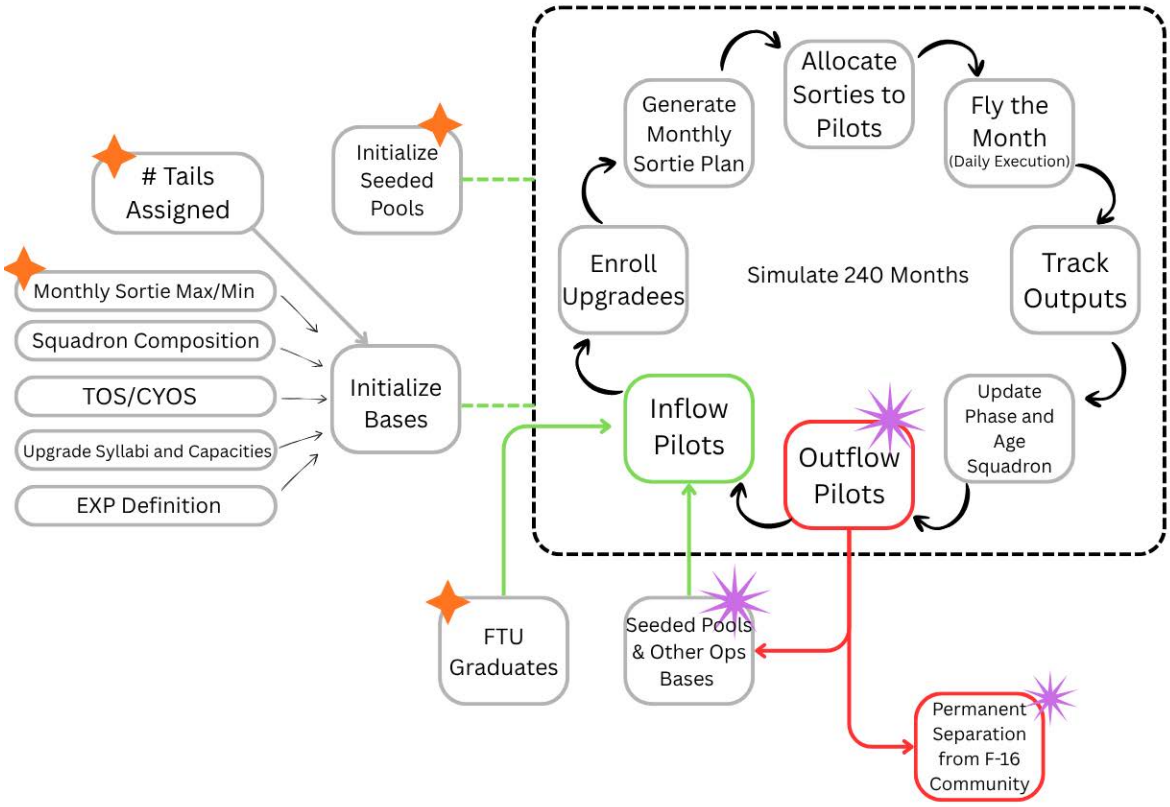
The F-16 community is also a useful case because it has a well-defined training pipeline and has experienced both conventional separation and retirement losses as well as transition losses to newer generations of fighter aircraft. This makes it a particularly relevant baseline for studying personnel dynamics that may later emerge in other MDSs. This is especially true in fifth generation communities that will experience similar transition patterns as the AF continues its fighter acquisition and squadron stand-up cycle. Although the baseline model is parameterized using F-16 data, the underlying system logic does not inherently assume an F-16 community. Rather, MDS-specific characteristics are captured through the model's inputs and initialization procedures. Adapting the model to another community would therefore primarily require access to that community's historical PCS patterns and syllabus structure. Baseline model outputs were validated with ACC/A3TF prior to the introduction of policy levers. What follows is a detailed explanation of the model's underlying logic before the policy perturbations are evaluated against this validated baseline case.

Conceptual Model

The conceptual model is depicted in Figure 3.1. Each scenario begins by initializing a simulated aircraft community representative of the real-world inventory in terms of aircraft, manning, experience, and qualifications. Initialization is based on the available aircraft within the selected community, which are then distributed across multiple units. Pilots are assigned according to aircraft allocation, and non-flying and AETC positions are filled accordingly.

From this baseline, the model generates inputs that govern the community's behavior, such as inflow schedules, monthly sortie-generation calendars, syllabus requirements, upgrade protections, and historical PCS patterns. Each of the scenarios is then replicated several hundred times using a Monte-Carlo simulation set up, as indicated by the dashed line in Figure 3.1. In each replication, the model simulates 240 months (20 years), during which units proceed through the same monthly sequence of events.

Figure 3.1: Simulation Conceptual Model



NOTE: Orange stars denote input metrics validated by SMEs, while purple stars denote metrics derived from historical PCS data.

In each simulated month, the model: (1) inflows pilots to squadrons, both from FTU and from previous assignments; (2) probabilistically enrolls pilots into upgrades, subject to syllabus maximums, (3) generates a monthly sortie plan based on upgrade priorities (4) allocates sorties to individual pilots using package and qualification mix rules, (5) flies a month of sorties using a daily executor, (6) records pilot-level monthly statistics, (7) updates pilot upgrade metrics and squadron age, and (8) outflows pilots from units, either into other units, assignment pools, or out of the system entirely.

As a variance reduction practice, the initialized community, sortie generation calendar, and FTU inflow calendars are held constant across replications within a given scenario. As a result, "month zero" is identical for each replication of the same scenario.

Overview

Fundamentally, this is a community-level absorption and pilot assignment model designed to evaluate whether personnel policies that improve assignment stability could also increase absorption capacity, support healthy experience mixes, and reduce readiness degradation in operational fighter squadrons. At the unit level, the model separates sortie generation into a

planning phase and an execution phase, aiming to represent the gap between intended and realized flying. During monthly planning, the model determines what sortie packages should be scheduled to support upgrades, satisfy RAP requirements, and sustain readiness given historical sortie-generation patterns. During daily execution, those packages are tested against the realities of unit manning, including qualification availability and operational constraints. In this way, the model introduces realistic friction between planned and executed flying, allowing weather, maintenance, personnel, and operational limitations to shape observed throughput and readiness.

Model Inputs, Parameters, and Outputs

Overall, the model combines multiple categories of inputs and parameters to produce a range of statistics useful for evaluating absorption capabilities across the community. The assumptions, inputs, and outputs are summarized below for ease of reference.

Inputs and Parameters

- Force Structure and Personnel
    - The number of wings and aircraft tails assigned
    - Initialization: the number of API-1, API-6, and API-8 – *attached* pilots; experience levels (%) for each category of pilot
    - Inflows: monthly tail-proportional FTU arrival calendar, length of total number of months simulation is run
    - Months on station threshold for PCS eligibility
- Sortie Generation
    - Yearly total and monthly minimum/maximum per wing
        - Monthly sortie calendar generated for the total number of months simulation is run using 12-month sum mechanism
    - Ops Tempo: the number of fly days per month
- Training
    - Definition of Absorbed: Sortie count and qualification requirements
    - Upgrade Syllabi, capacities, and re-fly rates
    - The number of initial pilots qualified as IP
- Scheduling Priorities
    - Sortie upgrade-protection percentage
    - Monthly sortie limits: the number of sorties per pilot
    - Weekly upgrade sortie limits: the number of upgrade events students can be scheduled to fly
- Stochastic Distributions
    - Initialization: distribution for TOS, CYOS, MDS sorties, and qualifications
    - Inflows: distribution for FTU arrival MDS sorties and CYOS

- Non-CAF Sortie Accrual: distribution of MDS sorties gained from FTU and Weapons/Test/Interceptor pool
- Upgrade Enrollment: per-month likelihood of upgrade eligibility given MDS sorties
- Sortie Allocation: daily pilot unavailability and upgrade re-fly outcomes
- PCS Assignment Routing: distribution for historical follow-on assignment outcomes

Outputs

- Monthly Qualification Composition: % of wing by qualification
- Monthly Experience Composition: % of wing by experience levels
- Upgrade Cycle Completion Timelines: Mean upgrade cycle duration per upgrade per wing
- Time to Flight Lead (TTFL): per wing
- Yearly absorption Capacity: the number of INX entered that left as EXP ÷ the number of years
- RAP Minimum Negligence: the number of total pilots per wing below RAP minimum, the number of pilots per qualification per wing below RAP minimum
- Inventory Metrics: Difference in starting and ending inventory system wide and per wing/pool
- **Summary Results Metrics:** Yearly Absorption Capacity, Time to Flight Lead, INX/EXP Ratio, Qualification Mix[12]

The first two metrics in Table 3.1 represent absorption outcomes identified in the preceding chapters as observable measures of retention, whereas the latter two provide visual representation of the concentration of personnel changes.

Table 3.1: Summary Result Metrics for Analysis

Metric	Definition	Level of Aggregation
Yearly Absorption Capacity	The number of pilots who enter the model as inexperienced and exit as experienced, normalized by the number of simulated years.	Averaged across simulation runs and reported for each wing and for the aggregate operational force.
Time to Flight Lead (TTFL)	The number of months between a pilot's arrival at an operational squadron and	Pilot-level results are aggregated across all

[12] While RAP noncompliance is an important driver within the model logic and is reported as an output, it is not used as a primary summary metric. The sortie calendar used to parameterize the model reflects years in which squadrons struggled to meet RAP minimums; therefore, even if changes in personnel composition reduce RAP noncompliance, sortie under-allocation in the input data may still constrain observed improvement.

Metric	Definition	Level of Aggregation
	completion of FLUG. Calculated only for FTU-arrival pilots who achieve experienced status before exiting the simulation.	simulation runs and reported as mean and median values.
INX/EXP Ratio	Monthly ratio of inexperienced to experienced pilots, where experienced status is defined by completion of FLUG.	Calculated at the squadron level, aggregated across runs, and reported for each wing and for the aggregate operational force.

The remainder of this chapter describes in greater detail the logic guiding the simulation initialization and the eight monthly steps introduced above.

Aggregation Level: The Wing

An important feature of the model is that, although it is designed to capture system-level dynamics, its unit structure is aggregated at the next higher organizational level: the Wing. The Wing reflects the level at which both historical data and SME validated inputs – such as assigned primary mission aircraft inventory (PMAI) and sorties flown – are available. This aggregation does not reduce the model's ability to represent unit-level dynamics, as PMAI and related resource constraints can be scaled downward to represent individual units predicated on the availability of lower-level historical inputs. Wing-level aggregation therefore represents a data-informed compromise between operational realism and empirical support. For the discussion that follows, the wing will serve as the model's primary level of aggregation.

Model Initialization Logic

Several initialization steps are performed outside of the simulation run, including initial pilot allocation and the creation of FTU inflow calendars and sortie generation calendars. The first two of these are a function of the number of aircraft assigned to each location, whereas the sortie generation calendars are derived from historical data.

Aircraft & Manpower Allocation

Each Wing is assigned a specified number of aircraft "tails" based on the FY26 CAF Force Structure Worksheet (ACC, 2026). This value represents the total number PMAI currently postured at each of the wings. It excludes training and development aircraft located at each wing and, for initialization purposes, assumes full aircraft availability. This assumption does not imply that all PMAI aircraft are available each fly day; rather, the assigned PMAI totals only dictate capacities and wing sizes as the model steps through time.

Wing initialization is driven in part by the number of assigned "tails," but it is also informed by AF manpower guidance and personnel categorization conventions. One of the primary ways

the AF categorizes flying billets is through Aircrew Position Indicators (APIs). Of particular relevance to this research are API-1, API-6, and API-8 pilots. API-1 pilots represent "line pilots", whose primary duty is in-squadron flying. By contrast, API-6 and API-8 billets represent flying staff and attached leadership positions, including commanders, senior staff, and executive pilots (DAFMAN 11-401, 2023). In this research, API-6, and API-8 pilots are grouped into a single category referred to as *attached positions*. As they share the same sortie requirements, additional disaggregation is not necessary for the purpose of this model. API-6 and API-8 pilots are modeled as 100% experienced because these positions require the pilot to hold a minimum of 4-ship flight lead qualification. API-1 pilots, in contrast, may be either experienced or inexperienced and represent the main operational body of the squadron.

In addition to differences in qualification status, attached pilots are assigned different monthly sortie minimums, reflecting the greater share of non-flying duties they perform at the group and wing level. In the results presented here, experienced line pilots and attached pilots are assigned a monthly RAP minimum consistent with the F-16 RAP Tasking Memorandum (RTM). The distinction in sortie assignment is based on the sortie requirement split between basic mission capable (BMC) and combat mission ready (CMR) pilots. Attached pilots are modeled at BMC rates, whereas line pilots are required to meet CMR rates. As a result, experienced BMC pilots, *attached pilots*, are required to fly approximately 65% of the monthly sorties required of experienced CMR pilots (AFMAN 11-2F-16, 2024).

Pilot Qualification & Experience Initialization

The model also incorporates the Air Force mandated 45/55 inexperienced-to-experienced pilot ratio, from the early 2000s summits, during wing initialization (Penney, 2025b). Initial wing populations are forced to follow this ratio, but this is the only stage at which the experience ratio is exogenously imposed. From month zero on, all experience distributions emerge as a product of the model's upgrade and PCS logic. Consequently, the experienced-to-inexperienced mix becomes both an important validation metric and a key analytical output.

At initialization, each wing is populated with pilots equal to 1.5 times[13] the number of assigned "tails," and the required experienced/inexperienced split is then applied. Once the pilot population is created, the model first assigns each pilot a time-on-station (TOS) value. TOS is randomly drawn from a continuous uniform distribution of 0 to 36 months, i.e. $X \sim U(0,36)$. Because TOS is treated as an input parameter, users may impose alternative limits if desired. TOS is assigned first because it serves as the basis for several subsequent initialization steps; TOS is also independent of AF regulations and other model inputs.

After TOS is assigned, the model initializes pilot qualifications based on user-specified inputs. In particular, the user may specify the proportion of experienced (EXP) pilots who begin the simulation with the IP qualification. The remaining EXP pilots are assigned as 4-ship flight

[13] Air Combat Command A3T SME, email exchange with the author, May 2026.

leaders, consistent with the historical definition of an EXP pilot. Qualification assignment for inexperienced (INX) pilots is determined by the pilot's initialized TOS. If TOS is less than three months, the pilot begins with no qualification, reflecting the AF requirement that MQT be completed within three months of arrival to an operational squadron (AFMAN 11-2F-16, 2022). If TOS exceeds three months, the pilot is initialized as a wingman.

Once pilots are assigned TOS, experience level, and qualification status, the model assigns everyone an initial MDS sortie count using a random uniform draw. The range of the draw depends on both experience and qualification level. For INX pilots, the MDS sortie draw is primarily a function of experience status. For EXP pilots, the draw is driven more directly by qualification level, since the model explicitly imposes instructor-related positions with the EXP population. One important caveat applies to the initial INX population: the model limits initial MDS sortie accumulation for INX pilots to nine sorties per month, consistent with RAP standards. This value is user-adjustable so that it can be tailored to the community in consideration. This restriction is intended to ensure a realistic initial INX population, as seeding newly arrived FTU pilots with sortie counts too close to the EXP threshold would create an implausible initial condition.

Non-CAF Pools

Because the model is intended to represent the fighter pilot community at a broader level, it also initializes several pilot "pools" outside of the CAF wing structure. These pools represent the assignment categories pilots are routinely assigned to satisfy non-CAF billet requirements. While, in reality, these assignments vary for everyone, the model groups similar non-CAF roles based on sortie accrual and qualification requirements. This approach maintains analytical tractability while still capturing the key personnel dynamics relevant to this research.

The model includes four non-CAF pools: UPT, FTU, Weapons/Test/Interceptor, and Non-Flying. The last of which is the broadest category and includes assignments to IDE, SDE, staff positions, and school assignments. Although this bucketing approach for non-flying positions simplifies the underlying assignment structure, it is justified for the purposes of this research because these assignments do not directly affect the personnel policies under examination and pilots do not accrue MDS sorties while assigned to them. The Weapons/Test/Interceptor pool is also relatively broad in scope but are grouped together because these assignments require pilots to be fully-qualified instructor pilots. Also, sortie accrual across these assignments is sufficiently similar for the purposes of the model. The UPT and FTU pools represent the AETC "white jet" billets that combat communities are required to fill. These two categories are modeled separately because pilots assigned to them return to CAF assignments with different MDS sortie counts and qualification outcomes.

The model automatically populates these pools according to the fill priorities specified in the RMD (Allvin, 2025b). Pilots assigned to the Weapons/Test/Interceptor pool are initialized with MDS sortie counts, TOS, and qualification levels consistent with IPs assigned to CAF wings.

Pilots assigned to the FTU and UPT pools are initialized with MDS sortie counts, TOS, and qualification levels consistent with 4-ship flight leads at the CAF wings. Finally, pilots assigned to the non-flying pool pools are initialized at varying levels of MDS sortie count, TOS, and qualifications, consistent with the thresholds associated with EXP pilots in general.

As with the INX/EXP split, pilot sortie counts and qualifications are assigned from statistical distributions only when they first enter the simulation, either through the initialization or through the FTU arrival process discussed below. After entry, pilots age entirely according to model dynamics. They accrue sorties and time on station while gaining qualifications through enrollment in, and completion of, the required upgrade processes. In addition, sortie accumulation can also occur through support sorties and upgrade re-flies.

FTU Inflow

Following initialization, the model includes only one true source of pilot inflow: FTU arrivals. Based on multiple discussions with SMEs at ACC/A3TF, the most realistic representation of FTU production was determined to be a time-based, ramped inflow calendar. Using FY25 required FTU output as a starting point and FY29 intended FTU throughput as the target,[14] the model constructs a multi-year FTU arrival schedule that begins at the FY26 requirement and gradually increases annual FTU production over the first few years of the simulation timeline. In the baseline case presented here, this corresponds to a 20-year simulation, with annual FTU output gradually ramping upward until it reaches the FY29 requirement in year 4. From this point, arrivals remain constant for the remainder of the run.

Total FTU output is distributed across wings using a tail-based proportional allocation mechanism; wings with more assigned aircraft therefore receive a correspondingly larger share of FTU graduates. Although wings are capped at the 1.5 times the assigned tails under the general PCS flow logic described below, the model permits more FTU arrivals than this threshold. This modeling choice is consistent with the historical overmanning of INX pilots at operational wings.

To align with the cycle-based upgrade mechanism discussed below, and to reflect the cyclical nature of real-world FTU cohort-based graduations, the model structures FTU arrivals in evenly distributed four-month segments. Each wing receives three batches of FTU arrivals per calendar year, but the arrival months are different across wings and years. Monthly arrival quantities are specified using a calendar incremented in 12-month intervals, that spans the length of the full simulation horizon. Pilots entering through FTU arrivals are initialized with no qualifications, and a MDS sortie count based on FTU syllabus production, subject to a small variation.

[14] ACC A3T SME, discussion with the author, June 2026.

The Upgrade Mechanism

Since the length and complexity of pilot upgrades fundamentally drive the absorption process, the upgrade mechanism represents one of the more critical components of the model. Although individual aircraft communities maintain detailed and standardized syllabi that govern upgrade requirements and completion criteria, the process by which pilots are selected for enrollment is far less standardized, and is left to the discretion of the unit commanders. While the structure and completion requirements of upgrade syllabi are well suited to modeling, the variation and subjectivity of upgrade enrollment require approximation.

Phase-Based Cyclical Upgrade Framework

Before turning to sortie planning and allocation logic, it is necessary to describe the model's phase-based cyclical upgrade framework. Modeling upgrade progression presents a challenge for two reasons. First, as mentioned before, historical data on upgrade timing and enrollment are limited. Second, upgrade progression is inherently individualized, making it difficult to codify representative upgrade rates and timelines in a standardized way. These challenges are compounded by the model's hybrid structure, which combines agent-based pilot movement with queue-based scheduling logic. As a result, the model adopts a simplifying assumption regarding upgrade flow. Because the model is intended for fighter communities, which are broadly similar in their sortie formation requirements, this simplification does not diminish the adaptability or realism of the model.

Fighter sorties are only flown in formations, primarily 2-ship and 4-ship formations. Accordingly, upgrade programs rely on a mix of these sortie types to season and prepare pilots for higher qualifications. Across the principal upgrade pipelines, syllabi are similar in terms of the number of 2-ship and 4-ship sorties required. In most cases, the main difference lies not in package structure, of formation, itself, but in the seat or role the upgrading pilot occupies within the package. For this reason, units often execute upgrades in phase-based fashion, with students progressing together through the 2-ship phase of training before collectively moving into the 4-ship phase. This operational logic forms the basis of the model's phase-based cyclical upgrade mechanism.

Under this framework, students are enrolled into an upgrade and complete all required 2-ship events before advancing, as a cohort, to the 4-ship phase. While a cohort remains in each phase, the monthly scheduler, described in the next section, only looks to plan upgrade packages associated with that phase; in 2-ship phase only 2-ship upgrade sorties are planned and similarly for 4-ship upgrade packages. The model does permit some degree of asynchrony across different upgrade types. For example, an instructor pilot upgrade (IPUG) cohort may still be in the 2-ship phase while a MQT cohort has already advanced to the 4-ship phase. However, the model does not permit multiple concurrent cycles of the same upgrade type; for instance, two separate MQT cohorts cannot progress simultaneously. This mimics the reality that squadrons progress through

upgrade cycles together; although, this cap is slightly stricter than reality as real squadrons may progress one-two students out of cycle.

Upgrade Enrollment Logic

The present model retains the upgrade-enrollment logic developed in the 2023 absorption model (Lara, 2024). This earlier approach was adapted in part because efforts to calibrate upgrade enrollment against historical data encountered substantial limitations, many of which remain. Notably, there is no centralized AF dataset that captures the number of MDS sorties a pilot has flown up to the point of upgrade enrollment. While each unit is required to maintain a record of qualification known as the Letter of Xs (LOX), this is only a periodic snapshot. Therefore, aggregate upgrade enrollment patterns across units are difficult to reconstruct. The two enterprise-level systems in which the information would reside – Graduate Training Integration Management System and Aviation Resource Management System – are both notoriously unreliable in their data recording practices.[15] Finally, upgrade enrollment in practice relies on the leadership's assessment of each pilot's readiness for movement to the next upgrade. For these reasons, constructing a historically accurate calibration dataset for upgrade enrollment is infeasible.

To mitigate these issues, the 2023 model establishes discrete probability mass functions that increase a pilot's likelihood of selection into upgrade as MDS sortie experience accumulates. MDS sorties thus act as a proxy for both proficiency and aptitude. During each enrollment event, pilots who exceed the minimum MDS sortie threshold for a given upgrade are deemed eligible. Eligible pilots are then prioritized from highest to lowest sortie count. For the MQT upgrade, candidates are also ordered by greatest to least TOS. If upgrade capacity is available within the predetermined syllabus limits, eligible pilots are enrolled until that capacity is filled.

One important departure from the original modeling effort concerns the frequency with which eligibility and enrollment is assessed. In the present model, enrollment follows the same cycle-based approach the overall upgrade logic follows. Pilot eligibility is evaluated only when an upgrade cycle closes and another one begins. In contrast, the original model assessed upgrade eligibility every month against syllabus capacity. Table 3.2 summarizes the upgrade-enrollment eligibility functions used in the baseline scenario and Figure 3.2 displays the corresponding probability mass functions.

Table 3.2: Upgrade Enrollment Eligibility Probability Mass Functions

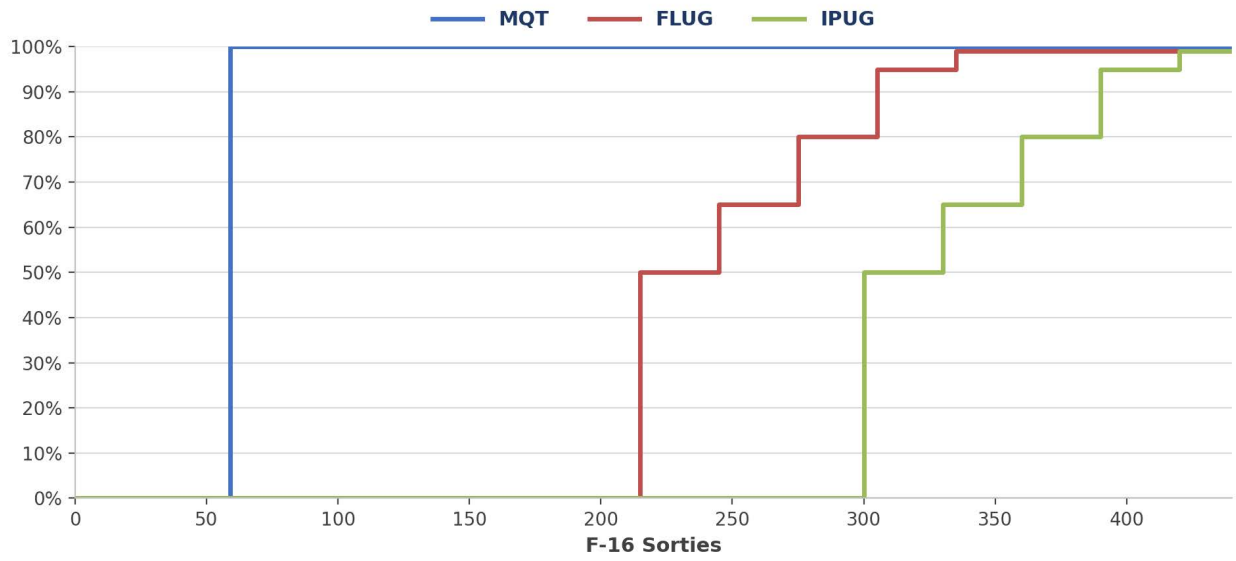
Upgrade	Min Probability	Increasing by	Every	Max Probability
MQT	100% on arrival (at 59±2 MDS sorties)			

[15] For more information regarding recommendations for data recording practices, see Lara, 2023.

Upgrade	Min Probability	Increasing by	Every	Max Probability
FLUG	50% at 215 MDS Sorties	15pp	30 MDS sorties	99% at 335+ MDS sorties
IPUG	50% at 300 MDS Sorties	15pp	30 MDS sorties	99% at 420 MDS sorties

NOTE: pp – percentage point. Upgrades listed in progressive order. Enrollment subject to upgrade capacity constraints (the number of simultaneous enrollees). FTU arrivals automatically enrolled in MQT once space is available. FTU-arrival MDS sortie counts based on F-16 FTU syllabus duration.

Figure 3.2: F-16 Monthly Upgrade Eligibility Probability Mass Functions



NOTE: Adapted from Figure 4.1 of Lara (2023).

Sortie Generation & Allocation

To determine the sortie-generation resources available to the model, monthly minimum and maximum sortie levels, along with annual sortie totals, are provided as simulation inputs. These values are derived from Flying Hour Program (FHP) briefs for FY25 and portions of FY26 provided by ACC/A3TF. Because the FHP briefs are aggregated at the wing level, their use further reinforces the wing-level structure adopted in this model.

The FHP briefs contain data on both total sorties flown and RAP sorties flown, as well as indicators of whether individual wings achieved RAP compliance in a given month. The difference between total and RAP sortie counts can vary substantially across wings, particularly as a function of access to in-flight refueling and the ability to "hot-turn" aircraft.[16] Access to in-

[16] This is the ability to refuel and relaunch an aircraft while the engine remains running.

flight refueling racks up RAP hours while keeping the same number of "total sorties flown".[17] Because RAP compliance is a principal metric used by the model to guide sortie allocation, the sortie-generation calendars are constructed using RAP sortie counts rather than total sorties flown.

Using this historical data allows the model to preserve important aspects of each wing's operational environment. Specifically, the resulting calendars reflect the geographically specific sortie-generation patterns, including constraints imposed by local resources and infrastructure. In addition, the FHP data includes months affected by severe weather and maintenance delays, thereby incorporating exogenous disruptions to sortie generation indirectly into the model inputs. Although deployments and training exercises are not explicitly modeled, the FHP data reflects months during which units are deployed or on temporary duty assignment (TDY). In this way, fluctuations in operational tempo are embedded implicitly in the sortie-generation inputs. Consequently, observed variation in flown or canceled sortie packages are more plausibly attributable to modeled personnel constraints after these broader exogenous effects have already been incorporated.

The sortie-generation calendars are constructed using the minimum and maximum and total RAP sorties flown.[18] For each simulated year, the model creates a 12-month sortie calendar by randomly drawing monthly values between the specified minimum and maximum, subject to the constraint that the sum of all 12 months equals the total provided as an input. Although this approach remains a simplification of the complex maintenance, resourcing, and budgeting dynamics that shape real-world sortie production, it still provides a useful approximation for analysis. It allows senior leaders to examine how personnel policy changes affect outcomes under multiple flying-hour program considerations.

An additional advantage of this approach is transferability. Because FHP briefs are a monthly reporting requirement for all aircraft communities, the required inputs to construct these sortie-generation calendars are available for other fighter MDSs, making the model adaptable beyond the F-16 community examined here.

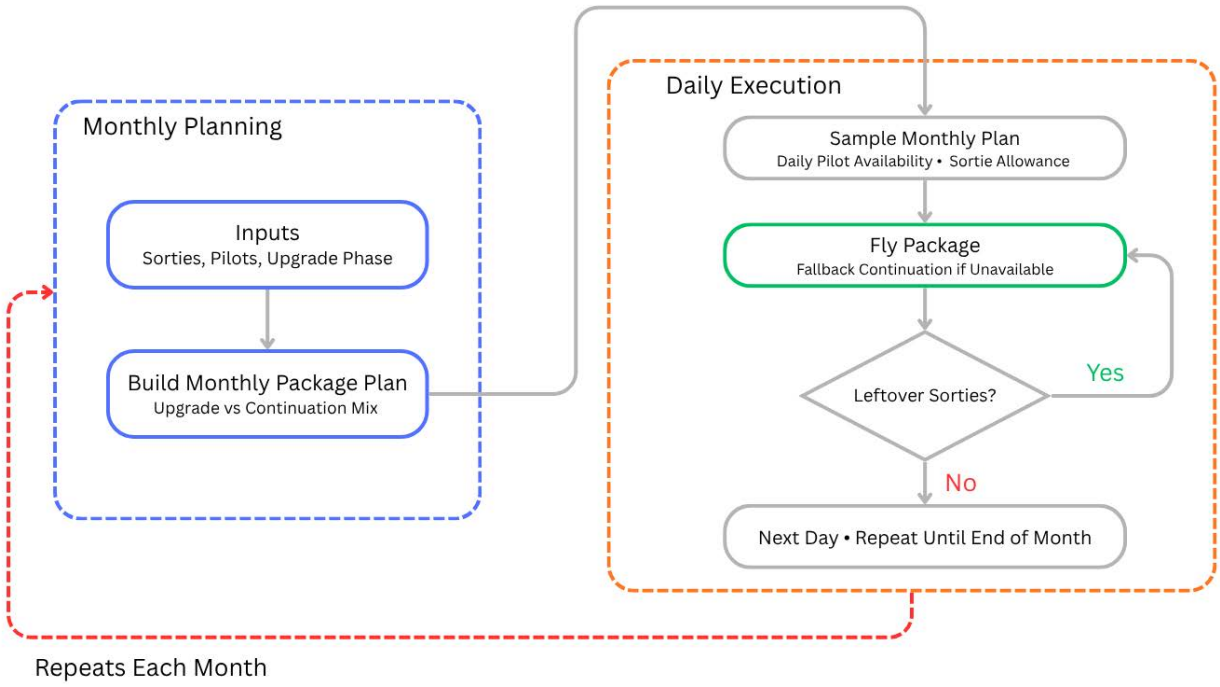
Monthly Scheduler & Daily Executor

The model separates sortie planning and allocation into two distinct but coupled processes: a monthly scheduler and a daily executor. Figure 3.3 provides visual representation of how the two pieces of the scheduler work together.

[17] ACC A3T SME, discussion with the author, June 2026.

[18] Minimum excludes the months when squadrons are on rest and relaxation after returning from deployment (DAFI 10-3001, 2020).

Figure 3.3: Sortie Package Generation and Execution Logic



This structure represents the distinction between planned and realized flying. At the monthly level, the scheduler builds a sortie plan that both supports upgrade progression and minimizes the number of pilots who fall below the RAP monthly minimum. The model permits a 20% RAP negligence within a wing; this is a user specified input that can be adjusted.[19] At the daily level, the executor attempts to fly the scheduled sorties subject to day-to-day feasibility and constraints.

The monthly scheduler does not plan against raw demand for minimum sorties or required syllabi events. It builds discretion for expected re-fly rates within upgrade syllabi by inflating the number of demanded upgrade events beyond the strict number of events needed for general completion. As the demand signal is increased, the monthly scheduler reacts by planning more upgrade sorties than potentially necessary. Broadly, the scheduler receives the total number of sorties available for the month and the percentage of those sorties protected for upgrades as inputs. If an upgrade-protected percentage is specified, those sorties are scheduled first. The model loops through available upgrade opportunities and builds feasible packages using available students, instructor pilots, and remaining sortie capacity. This process continues until either all protected upgrade sorties are scheduled, or no additional feasible upgrade packages can be constructed.

[19] 20% metric derived from conversations with ACC A3T SME, June 2026.

Within this protected-upgrade logic, the model weights MQT upgrade sorties the most because of the AF requirement that MQT be completed within 90 days of arrival to an operational unit (AFMAN 11-2F-16, 2022). FLUG and IPUG sorties are weighted more evenly, with a slight preference for IPUG sorties. Notwithstanding, the scheduler's primary objective is RAP compliance. At each decision point within this protected upgrade phase, candidate packages are evaluated according to three metrics: the number of pilots they would bring above monthly minimums, the degree to which they reduce total unmet RAP demand, and whether they contribute to urgent MQT completion. Once the scheduler exits the protected upgrade loop, it shifts to a greedy scheduling logic. This logic repeatedly selects the package providing the greatest immediate improvement in RAP compliance. In practice, this frequently results in additional 4-ship continuation packages, which tend to use available sorties efficiently and support more pilots in constrained flying windows.[20] Although this is a local rather than global optimization strategy, it is consistent with the models monthly planning structure and preserves the use of monthly RAP minimums as meaningful allocation guardrails rather than allowing them to become the sole driver of sortie scheduling.

After the monthly sortie plan is established, the daily executor distributes the planned packages across 20 flying days (also a user specified input).[21] Each day, the executor assesses whether the planned packages are feasible based on factors such as whether assigned pilots have already flown that day, whether pilots have reached their monthly/weekly sortie caps, and whether they reach a weekly upgrade-event limit. The executor continues iterating through the day until no further planned packages can be flown. If no scheduled package remains feasible, but there is still a sortie allowance, the model enters "fallback" mode. In this mode, it attempts to generate legal 2-ship and 4-ship continuation sorties that increase sorties for pilots below RAP minimums. If such sorties are not possible due to personnel constraints, the model enters "relaunch" mode. In this mode, the model relaunches an upgrade package as a "double-turn."[22] In this case, the sortie contributes to monthly sortie production but does not count as an additional upgrade event, approximating real world use of double-turns or repeated training sorties to increase RAP output and flying currency.

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[20] This optimization tendency motivated the implementation of protected upgrade sorties. A fully greedy scheduler would tend either to neglect upgrade packages or to over-prioritize them at the expense of sustained RAP compliance. Protected upgrade sorties therefore ensure that scheduling reflect multiple operational priorities.

[21] 20 days accounts for a four-week flying month disregarding weekends. This is the maximum number that pilots in the simulation can fly in one month to ensure synthesis with reality.

[22] This refers to when a pilot completes two sorties in one calendar day, either through engines running refueling or changing aircraft.

Residual Sortie Capacity

Although there are multiple fallback mechanisms, unused sorties can remain. Since fighter communities launch sorties in "formations," residual capacity is not always usable. For example, if only one sortie remains available at the end of a flying day, the model cannot – and should not – schedule it as a standalone event. In such cases, the unused daily sortie capacity may carry over into the next. If unused sortie capacity remains at the end of the month, it is retained within the annual 12-month flying hour budget. This annual budget is the specified input that constrains the total number of sorties available in a 12-month period. After 12 simulated months have elapsed, the carryover bank resets to zero and the sortie generation calendar begins again. This structure is intended to approximate the Flying Hour Program process, under which wings are allocated a yearly quantity of flying hours that may be distributed across months as conditions allow. The model does not permit inter-wing sortie exchange; although such transfers are physically possible in practice, they are not sufficiently common enough for explicit representation in this model.

Table 3.3 provides a consolidated summary of the sortie allocation process described above, including the monthly scheduler, daily executor, fallback and relaunch mechanisms, and residual sortie handling.

Table 3.3: Sortie Allocation Process Summary

Model Phase	Main Function	Priority Logic	Output
Monthly Scheduler	Builds sortie plan for the month	Protect upgrades first, then maximize RAP compliance	Monthly sortie plan
Daily Executor	Attempts planned sorties across available days	Respect day-level constraints	Flown sorties
Fallback Mode	Generates continuation sorties when planned are infeasible	Protect RAP minimums	Additional Continuation Sorties
Relaunch Mode	Uses double-turn upgrade packages when fallback fails	Preserve sortie production	Extra sorties without extra upgrade sorties
Residual Sortie Handling	Carries forward unused capacity	Stay within annual FHP budget	Updated sortie bank

Personnel Flow: PCS & Movement Logic

At the end of each simulated month, the model updates squadron-level and individual pilot metrics; it then executes personnel outflow and movement decisions. The model's PCS

movement logic operates through three decision layers for each pilot: historical separation behavior, assignment fill priorities, and historically-informed movement patterns.

These decisions are governed by two principal data sources: the RMD and a de-identified Air Force personnel dataset, provided by RAND Project Air Force, that tracks active-duty assignments from FY2012 through FY2025. The original dataset was filtered to include only individuals who, at some point in their careers, occupied an F-16 assignment. The resulting tailored dataset is used as an input to the model and includes current assignment location and CYOS for each pilot. In the model, CYOS serves as a proxy for rank to preserve movement patterns consistent with normal career progression.

Using this data, the model constructs assignment transition probabilities from each wing as a function of CYOS. Thus, when a pilot becomes eligible for PCS, the model first identifies the pilot's departing location and CYOS and then references the corresponding weighted probability distributions of historical follow-on assignments. A random draw from this distribution determines the pilot's historical destination assignment.

When a pilot reaches 36 months TOS, and is not actively enrolled in an upgrade, the model first checks the historically sampled destination from the process described above. If that destination is separation or transition, the model honors the outcome. These are the proxies for retirement, separation from active duty and transitions to other aircraft and career fields. The one exception occurs when the pilot has not yet reached 11 CYOS. In that case, the model does not permit separation – 5 years CYOS is the minimum for transition allowance. These restrictions serve two purposes: they account for reporting discrepancies in the underlying data, and they ensure that pilots complete their initial ADSC before separating and at least one operation assignment before transitioning.

If the historical destination is not separation or transition, the model proceeds to the assignment fill logic while storing the originally sampled historical destination. The fill logic operates in three tiers, consistent with the FY26 RMD guidance. First, the model fills training (UPT and FTU pools) and line units to between 90-100% of required manning, using a 12-month rolling lookback. Second, it fills attached positions to the same 90-100% range using the same lookback approach. Third, it fills non-flying and weapons/test/interceptor positions to a 67% threshold (Allvin, 2025b).

Once these fill priorities have been satisfied, the model returns to the pilot's previously sampled historical destination and assigns the pilot, provided the gaining location has capacity under the 1.5 times the tails constraint. This structure explains why the fill targets for operational and training units are set at 90% rather than the 100%; historical PCS flows may still send additional pilots to these locations after minimum fill priorities have been satisfied. Similarly, the 12-month rolling lookback helps ensure that historical PCS patterns remain active in the model while still preserving adequate manning at operational and training units.

Before the simulation advances to the next month, the model resets the state variables used to support monthly planning and records the performance metrics used for subsequent analysis.

Chapter 4. Model Excursions and Results

This model is implemented using object-oriented Python architecture. This structure is well suited to the problem because certain parameters and decision rules operate at the pilot, base, and community levels. Representing these levels as separated objects allows model logic to reside at the appropriate level of aggregation while still enabling information to be shared across the system. During each simulation run, data is stored at the individual pilot level and later aggregated to produce run-level summary statistics.

Constructing and validating the baseline case was essential before introducing policy perturbations, as the credibility of the results depends on the accuracy of the initial state. The two policies examined in this dissertation affect the model's movement logic and therefore can be evaluated against the same validated baseline. As noted previously, the baseline scenario is parameterized using F-16 community data. With support from SMEs at the 20th Operations Group (OG) at Shaw AFB, as well as policymakers and data analysts at ACC/A3TF, an empirically grounded steady state baseline was developed prior to policy deviations.

One clarification regarding collaboration with the 20th OG is warranted. Although wing-level inputs such as flying hours and assigned aircraft were validated separately for each wing, the syllabi and upgrade requirements used in the model are drawn specifically from the 20th OG and applied broadly. While the overall F-16 mission is similar across operational units, the specific training requirements vary somewhat by mission set. The F-16 community primarily supports two mission areas: Suppression of Enemy Air Defenses (SEAD) and Air Interdiction/Close Air Support (CAS) (U.S. Air Force, 2021). These mission sets are distributed across the six main F-16 CAF bases, generally characterized by the types of F-16's assigned. There are two types of active-duty F-16s: Block 40 F-16 C/D and Block 50 F-16 C/D. This distinction reflects differences in the avionics and weapons-system configurations of the aircraft assigned to each base. Block 40 squadrons are assigned to the Air-Interdiction/CAS mission while Block 50 squadrons train for the SEAD mission.

Although air-to-air tactics and training objectives differ across these mission sets, the total number of sorties and underlying formation-set structure remain broadly similar. Because the model does not operate at the granularity of sortie hours or mission-specific training objectives, the use of the 20th OG's syllabi – representative of a Block 50 squadron – is acceptable across the rest of the F-16 CAF wings for the purposes of this analysis.

Parameterization

The parameterization presented here reflects a combination of observed data snapshots, discussions with ACC-level leadership, validated values carried forward from the squadron absorption model that this research extends, and relevant Air Force doctrine. The supporting rationale and derivation of these inputs are provided in the previous chapter. The material below summarizes the model's initialization.

Wing Manning

To determine the initial mix of experienced and inexperienced pilots, the model uses a reference squadron population based on:

- 28 pilots at 40% experienced, and
- 6 pilots at 100% experienced.

The model combines these values into a single starting experience rate for the core population, resulting in an initialization mix of 50.6% EXP and 49.4% INX. This experience ratio is applied to each wing's core pilot population, which is scaled as a function of the number of assigned aircraft.

After the core wing population is initialized, the model adds attached pilots separately. The number of attached flight-leads and instructor pilots depends on the aircraft assigned to each wing.

Table 4.1 summarizes the manning initialization used across the simulation.

Table 4.1: Wing Manning Initialization

Wing	Aircraft Assigned[23]	Starting Core Pilots	Core EXP	Core INX	Attached FL	Attached IP
Aviano	42	58	29	29	7	8
Spangdahlem	24	33	16	17	5	5
Shaw	63	87	44	43	9	10
Misawa	39	54	27	27	7	7
Osan	24	33	16	17	5	5
Kunsan	36	50	25	25	6	7

[23] Derived from FY27 CAF force structure worksheet (ACC, 2026).

In addition to the initial attached IPs and FLs, the model stochastically assigns sortie counts and qualifications among the core EXP and INX pilots to produce a validated starting baseline. All model perturbations use this initial manning structure.

Pool Manning

There are four "pools" initialized at the start of each scenario: non-flying positions, test/weapons, FTU, and UPT. The model uses target fill ratios from the FY27 RMD and applies them to the SME validated billet for each of these destinations.[24] Table 4.2 summarizes the starting population of the pools that is consistent across perturbations:

Table 4.2: Pool Manning Initialization

Pool	Authorized	Min Fill	Max Fill	Initialized
FTU	80	0.95	1.00	70
UPT[25]	50	0.95	1.00	40
Weapons/Test	117	0.87	0.92	79
Non-Flying	256	0.4	0.67	171

FTU Inflows

The only inflow/outflow specifically constrained and not left to the model logic is the inflow of FTU arrivals. They are initialized using a tail-proportional calendar that ramps from 59 annual arrivals to 85 annual arrivals over the first few years of the simulation.[26] These arrivals are allocated across wings in proportion to assigned aircraft tails. Each year, arrivals are distributed stochastically and compressed into 4-month arrival blocks, with inflows occurring in the first month of each block. Table 4.3 summarizes the wing shares of FTU arrivals and is consistent across perturbations:

[24] To reflect the manning shortfalls described in SME interviews, these pools were intentionally underfilled at initialization relative to their authorized levels.

[25] Derived from FY27 "white-jet" fighter requirements and scaled according to the F-16 community's proportion of overall fighter force structure (Simmons, 2025).

[26] Derived from the target FY25 F-16 FTU production numbers (59) and the target FY29 F-16 FTU production numbers (85). ACC/A3T SME, email exchange with the author, April 2026.

Table 4.3: FTU Inflow Allocations

Wing	Aircraft Assigned	Tail Share of FTU Arrivals (%)
Aviano	42	18.4%
Spangdahlem	24	10.5%
Shaw	63	27.6%
Misawa	39	17.1%
Osan	24	10.5%
Kunsan	36	15.8%

Sortie Generation

Sortie generation is based on flying hour program data obtained from Air Combat Command (ACC) for FY25-FY26. For each wing, the model specifies an annual sortie total along with minimum and maximum monthly sortie constraints. The annual total is then randomly distributed across the 12 months, subject to those bounds. This process creates a unique monthly sortie calendar for each wing while preserving the annual total. The resulting 12-month calendar is then repeated across the full simulation horizon.

During model validation, two separate sortie-generation calendar variants were constructed. The first used only those months in which each wing achieved RAP compliance. The second used all available months provided in the FHP data. Following discussions with ACC/A3TF regarding baseline outputs generated under these two calendar constructions, the second approach was determined to more accurately reflect the operational environment at the wings.

Table 4.4 summarizes the constraints used to construct these calendars, which are held constant across perturbations.

Table 4.4: Sortie Generation Calendars

Wing	Annual Sortie Total	Min Monthly Sorties	Max Monthly Sorties
Aviano	5,542	437	650
Spangdahlem	4,000	327	403
Shaw	8,375	669	907
Misawa	5,705	340	624
Osan	3,432	260	416

Wing	Annual Sortie Total	Min Monthly Sorties	Max Monthly Sorties
Kunsan	5,482	252	576

NOTE: Osan's sortie generation inputs are notably lower than the other wings because FY25-FY26 included sustained TDY activity and red flag support at that base. While the resulting sortie profile is valid for those specific years, Osan results should be interpreted cautiously, as they reflect an abnormal flying period rather than a typical steady-state condition.

Training Initialization

Using the 20th OG upgrade syllabi assumptions, the model initializes each upgrade program with a defined number of 2-ship and 4-ship events, a tail-scaled monthly capacity, and a re-fly probability. Upgrade capacity is scaled by wing size so larger wings can support more concurrent students than smaller wings. Table 4.5 summarizes these initialized values.

Table 4.5: Upgrade Syllabi & Re-fly Rates

Upgrade	Award	Required 2-Ship Events	Required 4-Ship Events	Re-fly Rates
MQT	WG	4	7	0.10
4FLUG	4FL	4	6	0.2
IPUG	IP	4	6	0.25

NOTE: Re-fly rates reproduced from Lara, 2023.

Stochastic Initialization Parameters

The final category of inputs consists of parameters specified as random distributions. These values are drawn primarily from the 2023 research on squadron-level absorption dynamics (Lara, 2023). Table 4.6 highlights the random inputs and their values.

Table 4.6: Stochastic Input Parameters

Input	Value
Initial Population TOS	$U(0,36)$
Initial Population MDS Sortie Count (INX)[a]	$\min[U(59,383),\ 59 + 9 \cdot (TOS_i + 1)]$
Initial Population MDS Sortie Count (EXP)	$U(250,375)$
Initial CYOS, INX (Months)	$U(24,72)$

Input	Value
Initial CYOS, EXP (Months)	$U(72,180)$
Initial Attached FL MDS Sortie Count	$U(250,499)$
Initial Attached IP MDS Sortie Count	$U(300,899)$

NOTE: Adapted form Lara (2023), $U(a,b)$ means the discrete uniform distribution with minimum *a* and maximum *b*.
[a] The dependency between the initial INX MDS sorties count and TOS is intentional. It prevents non-sensical initialization of a pilot with 3 months TOS but hundreds of sorties.

Policy Excursions

The three policy excursions examined in this chapter are all grounded in the same underlying theory: if the fighter communities' obligation to source instructors for training units is reduced, more experienced pilots will remain in operational units. This increase in experienced personnel should improve absorption-related outcomes.

This expected improvement in absorption-related outcomes stems from several related mechanisms. (1) The extended 6-10-year assignment durations represented in these policies reduce the frequency at which training billets must be refilled, allowing multiple PCS cycles to pass without generating additional replacement demand from the operational force. (2) As fewer pilots leave to fill UPT and FTU instructor requirements, operational squadrons retain a larger share of their experienced personnel. (3) Because these pilots must be, at minimum, FLUG-qualified before they can be assigned to these training positions, reducing such diversion allows operational units to realize a greater return on the time and resources invested in upgrade completion. In addition, fewer departures to "white-jet" tours reduce the amount of requalification training required before returning to operational postings. This reduction frees up time and resources expended on qualified pilots retraining at FTU. These mechanisms imply that a lower training-enterprise debt should improve the operational community's ability to absorb inexperienced pilots and sustain a more favorable experience mix.

The policy excursions examined in this chapter translate these mechanisms into two distinct intervention approaches. The first policy seeks to retain experienced aviators within the training enterprise by diverting mid-career pilots into extended instructor tracks at the end of their initial ADSC. The second policy instead reduces training demand on the fighter community by sourcing a portion of UPT instructor billets from a career AETC track outside the operational fighter inventory. The third policy examines the interaction of these two approaches when implemented simultaneously.

The remainder of this chapter specifies the parameterization of each policy excursion, provides evidence of their successful implementation, and analyzes the resulting outcomes relative to the validated baseline described above. The chapter concludes with a comparative assessment of all three policy excursions. A broader synthesis of these findings, including their

relationship to interview evidence and their implications for the wider aviation community, is presented in Chapter 7. For the sake of simplicity, the model outcomes below are aggregated at the community level.

Policy 1: End of ADSC Instructor Track

The first excursion from the baseline model represents the policy described in the HQ DAF A34R intent-to-establish memorandum. As discussed previously, the policy seeks to improve manning and experience levels in the training enterprise by offering operational pilots, at the completion of the initial ADSC, an extended assignment at training units. This policy applies to both FTUs and UPT. Its central premise is longer instructor tours in these organizations will reduce turnover and lessen the recurring requirement for the operational community to source experienced pilots for training assignments. The anticipated result is greater instructor continuity at training units and higher aggregate experience levels within operational units.

Policy Parameterization

To represent this policy within the simulation, the model implements two parallel long-tour instructor tracks: one for FTU billets and one for UPT billets. In both cases, eligible mid-career pilots are identified at the end of their assignments and diverted from the normal assignment process into two long-term instructor pools; one for FTU and one for UPT. Eligibility is restricted to pilots between 11 and 15 CYOS who hold the 4-ship flight lead qualification. Candidates for both tracks are drawn from all available sources: operational squadrons, the non-flying pool, the weapons/test pool, and from FTU/UPT themselves. In both tracks, candidates not selected continue through the model's baseline assignment process.

Selection into these long-tour tracks is constrained by overall training-unit authorization and a path-specific ceiling. For each training pool, $k \in \{FTU, UPT\}$,[27] the path cap is defined as

$$c_k = \lfloor 0.70 \times A_k \rfloor \tag{4.1}$$

where A_k is the authorized size of the corresponding FTU or UPT instructor pool. This cap ensures that the long-tour track cannot exceed 70% of the total authorized positions in that training pool.[28]

Given these capacity constraints, the model then assigns a fixed proportion of the monthly eligible population into each path. The monthly intake is given by

[27] The pool of individuals is the same for both long-tour tracks. The model prioritizes FTU selection by selecting candidates for that track before UPT.

[28] Semi-structured interviews conducted for this dissertation suggested that there should be a continued rotation of a small percentage of CAF pilots through these positions. 30% rotating was set to mimic Laughlin AFB, which is the closest example to a working 30/70 MDS and non-MDS split.

$$I_k(t) = \min\left(\lfloor \alpha_k E_k \rfloor, C_k^{rem}(t)\right) \tag{4.2}$$

where E_k is the number of eligible candidates in month t, is α_k the monthly take rate, and $C_k^{rem}(t)$ is the remaining capacity available under the path cap and total authorization ceiling. In the configuration used for this dissertation, the monthly take rate is 20% for the FTU track and 10% for the UPT track.[29]

When the number of eligible candidates exceeds the available monthly intake, the model prioritizes selections using source-based balancing. The model compares the realized share of policy entries from each wing over the previous 12 months to that wing's target share – which is established at initialization from the baseline population distribution – and creates a priority list. Candidates from underrepresented wings are given higher priority, with additional weighting applied to preserve squadron balance and favor pilots already serving in the corresponding training environment (i.e. FTU candidates currently at FTU have a higher chance of being selected, and similar with UPT).

Once selected, pilots assigned to long-tour tracks receive an initial assignment length of 72 months, in accordance with the policy memorandum. At the completion of that period, the model applies a stochastic extension process reflecting the policy's option for two-year extensions beyond the six-year minimum. For this configuration, the probability of extension from six to eight years is 80%, and among those extended, the probability of continuing from eight to ten years is 50%.[30] At the end of the assigned duration, pilots permanently separate from the model rather than returning to the operational rotation. This assumption reflects the policy's intent to establish a durable training-career pathway and cohort rather than a temporary diversion from the traditional career path.

Implementation Evidence

To ensure the policy excursion runs produced valid comparisons, I first verified that the implementational modeled the Policy 1 levers as intended, which was to ensure that both UPT and FTU assignment pools did not become overpopulated.

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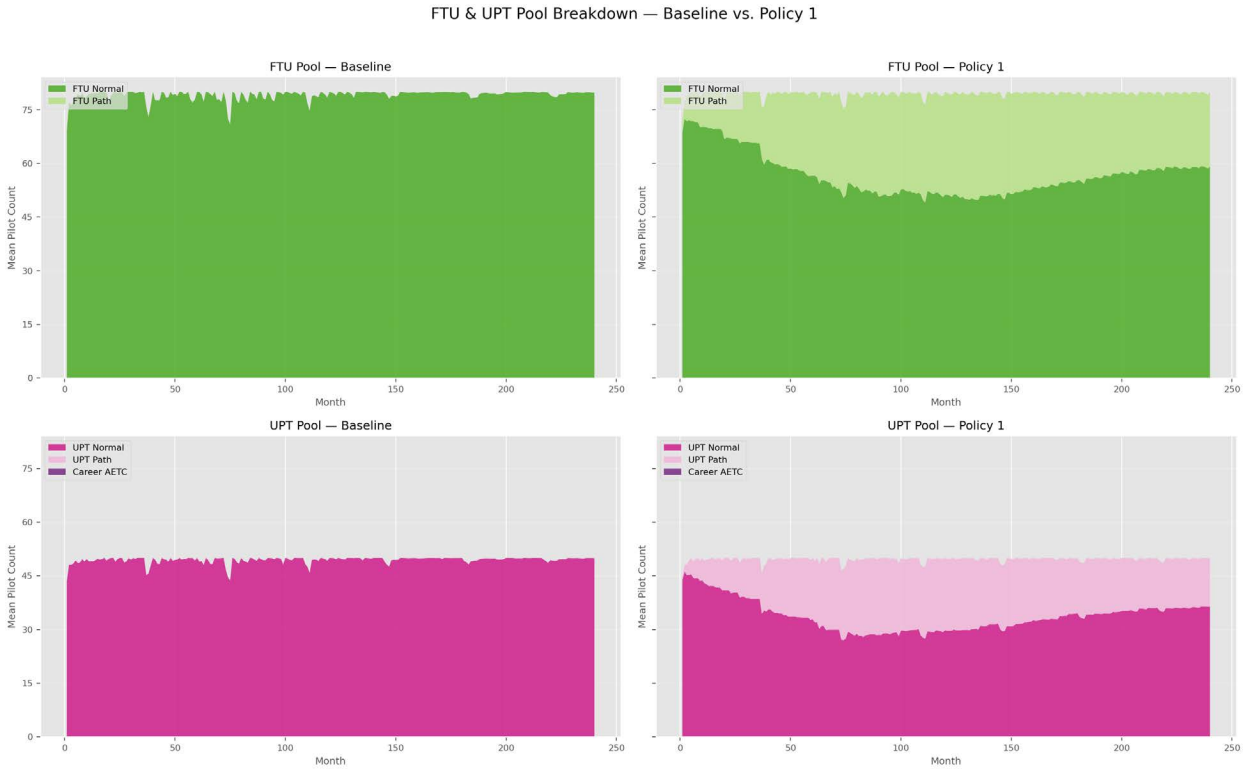
[29] Semi-structured interviews conducted for this dissertation suggested that the UPT option was perceived as significantly less desirable than the FTU option – hence the 50% reduction – and that the policy in general was viewed skeptically.

[30] Reflects the expectation that pilots approaching 17-19 CYOS would face a strong incentive to remain for an additional assignment in order to attain the 20-year retirement threshold. The lower probability of the subsequent extension reflects heterogeneity in retirement proximity at that point, as some individuals would still be short of eligibility while others would already have reached or surpassed it. (Mattock et al., 2016)

Figure 4.1: Comparison of FTU & UPT Pool Breakdown, Baseline vs. Policy 1



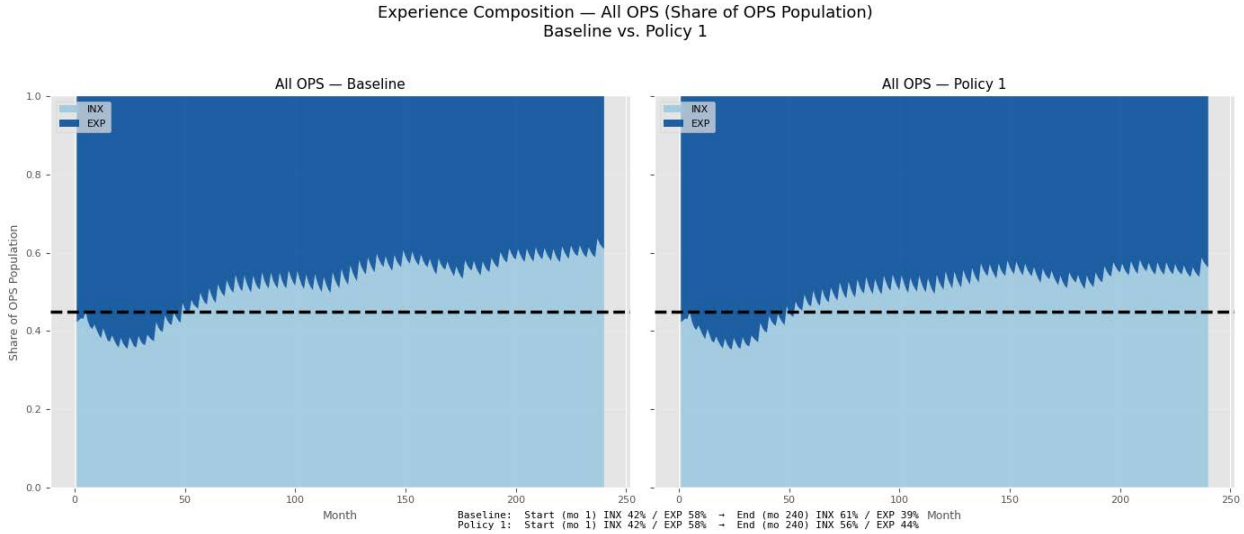
Both pools shift under Policy 1 shown in Figure 4.1, but neither shows sustained overfilling relative to its baseline size. The FTU pool experiences a larger rerouting effect, while the UPT pool shows a smaller change, consistent with SME-informed inputs of lower uptake rates on the UPT side. Figure 4.1 also shows that Policy 1 operates through a gradual redistribution of existing assignments rather than a sharp structural shift; the alternative pathway progressively expands while the normal pathway declines. These patterns suggest that Policy 1 was implemented as intended.

Having validated and verified the policy's implementation in the model, the following analysis examines its effects on the principal outcome measures relative to the baseline.

Results

Establishing a cadre of long-term instructor pilots at both FTU and UPT from within the existing fighter population produced only minimal effects across most modeled outcomes. The largest change appeared in the experience mix within operational squadrons. Relative to the baseline, this policy increases the end-state experienced share by 4.3 percentage points. Figure 4.2 indicates that, over time, this policy leaves operational squadrons modestly closer to the 45/55 INX/EXP target than in the absence of implementation.

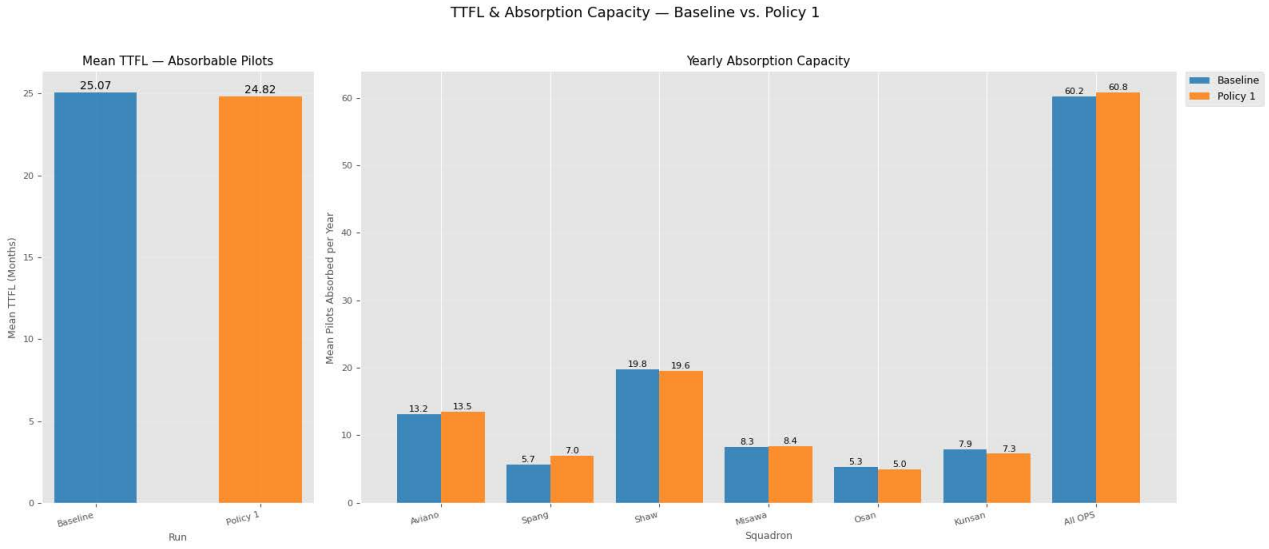
Figure 4.2: EXP/INX Mix All Ops Bases, Baseline vs. Policy 1



NOTE: Black dashed line indicates the 45/55 INF/EXP target mix.

Figure 4.3 shows the policy's modest effects on TTFL and absorption throughput. Because TTFL is measured at the pilot level rather than by location, it is presented as a single aggregate series, whereas absorption throughput is shown both by wing and in aggregate. The small but steady gains across operational wings suggest that the policy does not create a disproportionate advantage or disadvantage for any one squadron under this implementation.

Figure 4.3: TTFL and Absorption Capability, Baseline vs. Policy 1



Taken together, these results suggest a larger effect on inventory composition than on the pace of individual seasoning.

Table 4.7: Baseline vs. Policy 1 Output Comparison

Outcome	Baseline	Policy 1	Change
End Exp Share (%)	39.1	43.82	+4.72 pp
Mean TTFL (months)	25.07	24.82	-0.25
Pilots reaching EXP	1240	1255	+15 (+1.2%)
Avg absorption throughput (pilots/yr)	60	61	+1 (+1.6%)

Table 4.7 reports these outcomes and their changes relative to the baseline model. It also includes an additional metric: the total number of pilots who attain experienced status over the course of the simulation – restricted to those entering the system through FTU. As with the other reported measures, the increase relative to the baseline is small.

While Policy 1 seeks to reduce training-enterprise demand by retaining experienced aviators, the next excursion approaches the same problem by substituting career AETC personnel for a portion of the demand.

Policy 2: Career AETC track

The second policy excursion models the introduction of a career AETC track for UPT instructor billets. Unlike Policy 1, this policy does not create a new internal pool within the F-16 community. Instead, newly graduated UPT students are assigned directly into the AETC career track to fill a portion of white-jet instructor billets, thereby reducing the number of operational F-16 pilots required for UPT staffing.

In policy terms, the intended effect is to relieve the operational fighter community of part of its recurring instructor obligation to AETC. By sourcing a greater share of UPT instructor billets from career personnel, the policy reduces the need to divert experienced F-16 pilots away from operational assignments for white-jet tours. Importantly, this change does not alter fighter production. In both the modeled system and the real Air Force training enterprise, the production of new fighter pilots is determined separately from the assignment of UPT instructors. The

policy, in this research, therefore affects how instructor demand is sourced; not how many fighter pilots are produced.[31]

Policy Parameterization

Within the model, this effect is implemented through a modification to the UPT billet authorization mechanism in the baseline simulation. When the policy is enabled, a specified fraction of authorized UPT instructor billets is filled by career AETC personnel rather than by pilots sourced from the operational fighter community. In this way, the policy offsets demand for community-provided UPT instructors.

Operationally, this mechanism is parameterized through two user-defined inputs:

1. the percentage of UPT billets reserved for career AETC personnel, and
2. the number of months required to reach that percentage.

The model applies the specified percentage to the baseline number of authorized UPT billets, which is recorded at initialization and not subsequently altered.

Formally, the long-run target (B_{AETC}) is defined as

$$B_{AETC} = \lfloor p \cdot A_{UPT}^{0} \rfloor \tag{4.3}$$

where p is the user-specified proportion of billets reserved for career AETC personnel, and A_{UPT}^{0} baseline is the authorized UPT billets at initialization.

Each month, the model calculates how many billets are occupied by career AETC personnel and subtracts that quantity from the baseline UPT authorization. The remaining billets constitute the effective UPT requirement that must still be filled through the model's normal assignment logic.

$$A_{UPT}^{eff} = \max(0, A_{UPT}^{0} - B_{AETC}) \tag{4.4}$$

This adjusted authorization is passed to the model's normal fill-priority logic. Because fewer billets remain open to community pilots, fewer F-16 personnel are assigned to white-jet tours, and the community's UPT instructor obligation decreases accordingly.

Because the policy is introduced gradually rather than instantaneously, the model uses a stepped implementation function divided into three phases. Given the user-defined target percentage and implementation horizon, the model applies a uniform three-step ramp until the desired fill level is reached. This structure represents gradual adoption of the policy rather than instantaneous full implementation.

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[31] While these instructors are not sourced from the fighter community in this analysis, assigning them to this career track may reduce the number or new pilots available to other communities, potentially impacting their production targets. In short, somebody has to pay the bill.

For the policy run examined in this dissertation, the values of inputs were selected based on SME interviews. The model assumes that 70% of authorized UPT billets are ultimately filled by career AETC personnel, such that $p = 0.70$. This value reflects the highest FAIP/MDS IP mix identified by interviewees at a current UPT base, which they assessed as sufficient to sustain training production.[32] The transition to this level is implemented through a 72-month stepped ramp to represent phased adoption of the career track and to maintain consistency with the implementation horizon used in Policy 1. Under this parameterization, the pool of career AETC personnel increases by one-third of the total target every 24 months until the target is reached.

After this phased implementation is complete, the model maintains the target billet-fill level for the remainder of the simulation. This should be interpreted as a sustained manning level rather than a fixed cohort of individuals. In other words, the model assumes that personnel are rotated through these billets as needed to preserve the target fill rate, without explicitly tracking Career AETC members as part of the fighter-community inventory.

Implementation Evidence

For Policy 2, the key implementation expectation is the policy should change the composition of the UPT pool while leaving the FTU pool largely unaffected. Because Policy 2 alters only the number of F-16 pilots assigned to UPT, any visible effects should appear primarily in UPT staffing. The FTU pool remains nearly identical across the baseline and Policy 2 runs, indicating that the policy does not materially alter FTU manning as shown in Figure 4.4. The small variation that does appear likely reflects normal fluctuations in assignment routing as changes in the UPT candidate pool propagate elsewhere in the model.

[32] UPT Instructor, video discussion with the author, March 2026.

Figure 4.4: Comparison of FTU & UPT Pool Breakdown, Baseline vs. Policy 2

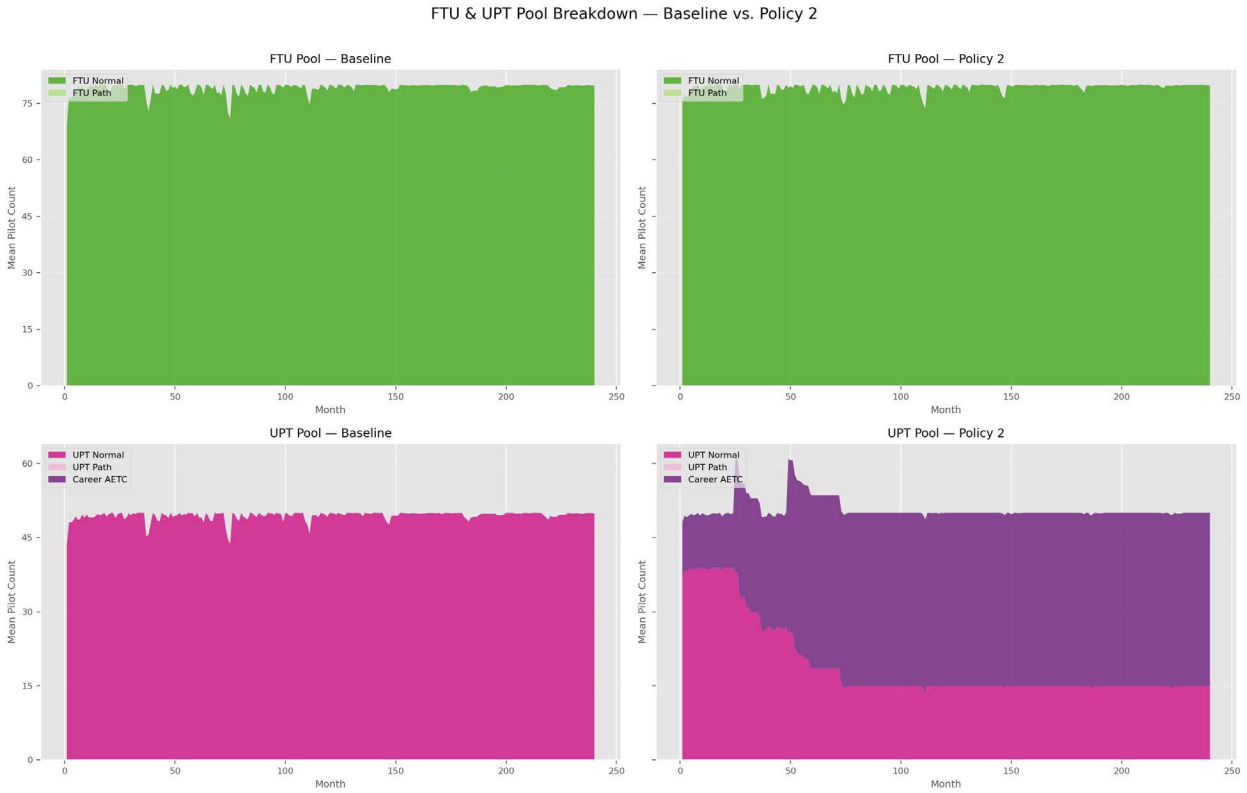


Figure 4.4 also shows that Policy 2 functions as a substitution mechanism rather than an additive source of UPT manning. Although the Policy 2 results show temporary spikes above the allocated UPT pool size early in the simulation, these spikes result from the interaction between the model's step-function implementation and its initial conditions. Once the career-AETC pathway reaches its user-defined level, the total UPT pool stabilizes, and the model stops drawing additional F-16 pilots from operational wings to satisfy that requirement.

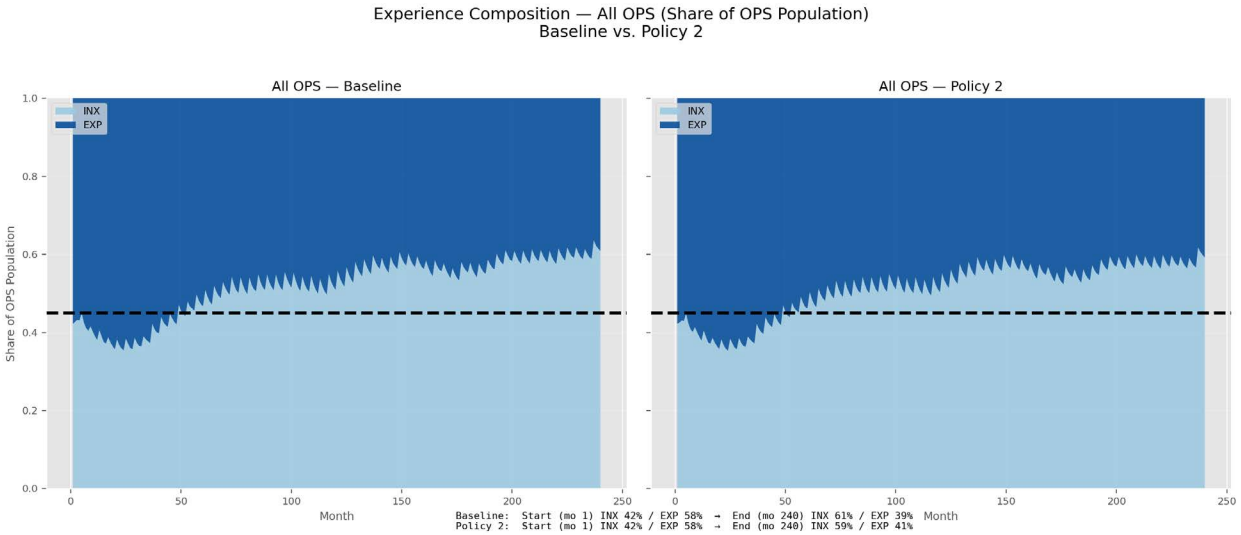
Outputs suggest Policy 2 was implemented as intended: it changes how UPT requirements are sourced without affecting FTU manning or overpopulating the UPT pool. This implementation defines the extent to which the F-16 proportion of the UPT demand decreases. Results discussed below examine how that change affects the modeled outcomes relative to the baseline.

Results

Creating a pool of career AETC instructor pilots from outside the fighter community inventory produced limited improvements relative to the baseline. Additionally, these pilots have to be sourced from other communities so while it does not affect production in this research, it ultimately will have downstream effects. The largest effect again appeared in the experience mix within operational squadrons. Relative to the baseline, policy 2 increased the end-state

experienced share by 1.7 percentage points. Figure 4.5 indicates that this policy shifts operational squadrons' ratios marginally closer to the 45/55 INX/EXP target than in the absence of implementation.

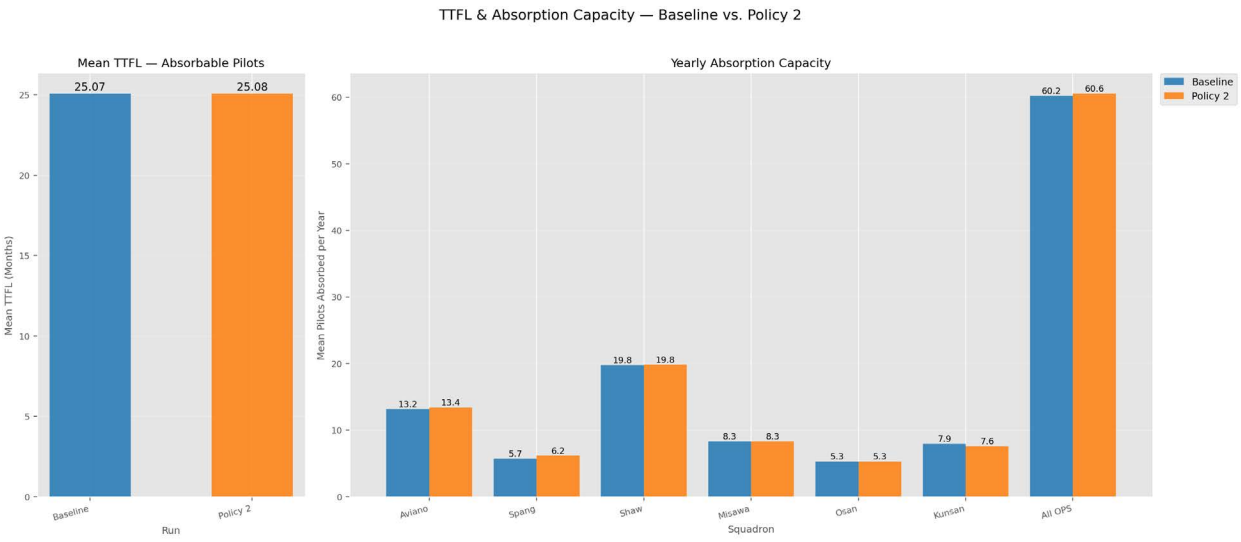
Figure 4.5: EXP/INX Mix All Ops Bases, Baseline vs. Policy 2



NOTE: Black dashed line indicates the 45/55 INF/EXP target mix.

Figure 4.6 shows the policy's effects on TTFL and absorption throughput. TTFL remains effectively unchanged, with a slight deterioration relative to the baseline, while absorption throughput records no change from the baseline.

Figure 4.6: TTFL and Absorption Capability, Baseline vs. Policy 2



Taken together, these results indicate that this policy has only limited effects on the modeled policy. Table 4.8 reports these outcomes and their changes relative to the baseline output. On the measure of the change in pilots reaching experienced status, Policy 2 produces only a 0.5% increase relative to the baseline.

Table 4.8: Baseline vs. Policy 2 Output Comparison

Outcome	Baseline	Policy 2	Change
End Exp Share (%)	39.1	40.8	+1.7 pp
Mean TTFL (months)	25.07	25.08	+0.01
Pilots reaching EXP	1240	1246	+6 (+0.5%)
Avg absorption throughput (pilots/yr)	60	60	None

Having examined these two mechanisms independently, Policy 3 examines their simultaneous enactment.

Policy 3: Simultaneous Implementation

The final policy excursion examines the simultaneous implementation of Policy 1 and Policy 2. Because the model treats these policies as independent toggles, both can be activated at the same time to represent a combined approach to training-unit manning. Conceptually, this excursion combines two mechanisms: the diversion of eligible mid-career pilots into extended FTU and UPT tours, and the replacement of a portion of UPT white-jet billets with career-AETC personnel. Together, these policies are intended to reduce the training burden placed on the operational fighter community through reduced demand to FTU through dedicated career tracks and UPT through externally sourced instructors.

Policy Parameterization

When implemented simultaneously, however, the two policies do not combine additively. Their interaction is non-linear because Policy 2 directly reduces the number of UPT billets available for Policy 1 to fill. In each month, the career-AETC pathway is applied first, removing a portion of the UPT requirement from the pool of billets that would otherwise be sourced from the F-16 community. Policy 1 can then fill only a share of the remaining UPT requirement, rather than a share of the original UPT authorization. In practical terms, Policy 2 takes the first cut at UPT manning, and Policy 1 can only operate on what remains.

The parameterization of the model run analyzed below illustrates this interaction clearly. Supposed the baseline UPT requirement owed by the F-16 community is 50 billets.[33] Under Policy 2, career-AETC personnel ultimately fill 70% of those billets at full implementation:

$$B_{AETC} = \lfloor 0.70 \times 50 \rfloor = 35 \tag{4.5}$$

This reduces the effective UPT requirement remaining to be filled by community-sourced pilots to:

$$A_{UPT}^{eff} = 50 - 35 = 15 \tag{4.6}$$

Under policy 1, the UPT long-tour instructor track can fill 70% of the billets still available at this point, which is 15, as shown in equation 4.6. Because Policy 2 has already reduced the effective UPT requirement, the maximum UPT-path capacity under Policy 1 becomes:

$$C_{UPT,path} = \lfloor 0.70 \times 15 \rfloor = 10 \tag{4.7}$$

Effectively, the career-AETC pathway dominates the UPT side of the policy effect. Policy 1 still operates in UPT, but only within the smaller residual requirement after Policy 2 is applied. All other aspects of implementation remain consistent with the individual policy descriptions discussed above.

This interaction is important because it shapes the steady-state effect of the combined policy on the training enterprise. Rather than simply stacking the full effects of both policies, the combined excursion fills training-unit requirements through a mix of new dedicated instructors and longer-term assignments for current pilots. The expected result is still a reduction in demands placed on the operational fighter community and, in turn, a corresponding increase in the experienced personnel available in the operational units.

Implementation Evidence

Figure 4.7 indicates that Policy 3 behaves as a true combination policy rather than simply reproducing the effects of one component mechanism. In the FTU pool, the gradual growth of the alternative pathway shows rerouting from operational assignments remains active. In the UPT pool, the presence of both the rerouted pathway and the career-AETC pathway confirms that both sourcing channels act simultaneously. The temporary spikes early in the UPT series reflect the same initialization dynamics observed under Policy 2, after which the career-AETC pathway stabilizes and displaces a portion of the requirement that would otherwise have been

[33] Derived from access to FY27 "white-jet" fighter requirements and scaled according to the F-16 community's proportion of overall fighter force structure (Simmons, 2025).

filled through rerouting. The result is a stable long-run distribution across both pathways, consistent with the intended implementation of the combined policy.

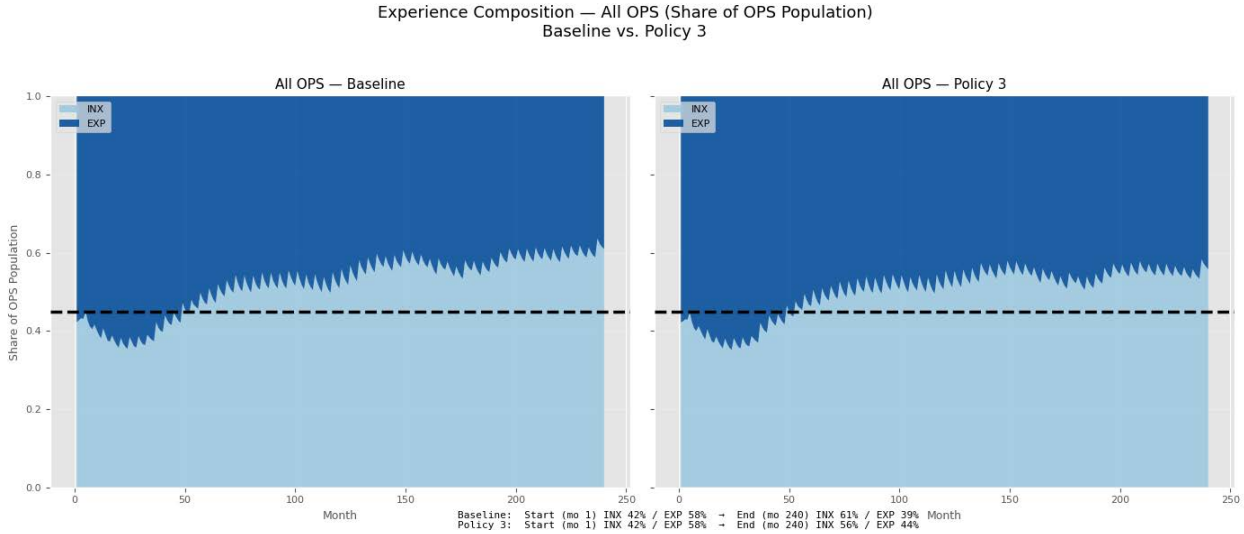
Figure 4.7: Comparison of FTU & UPT Pool Breakdown, Baseline vs. Policy 3



Results

Implementing Policies 1 and 2 simultaneously produced gains that were concentrated in the experience mix within operational squadrons. Relative to the baseline, the combined policy increased the end-state experienced share by 4.6 percentage points. Figure 4.8 indicates that this combined implementation leaves operational squadrons closer to the 45/55 INX/EXP target ratio.

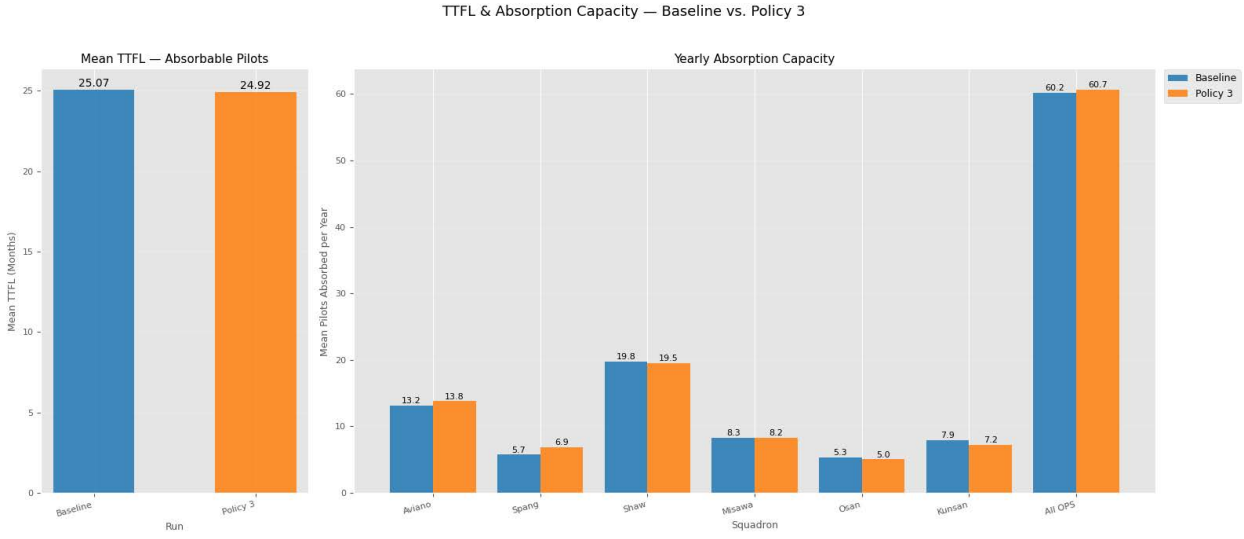
Figure 4.8: EXP/INX Mix All Ops Bases, Baseline vs. Policy 3



NOTE: Black dashed line indicates the 45/55 INF/EXP target mix.

Figure 4.9 shows the effects of the combined policy on TTFL and absorption throughput. As in the previous excursions, TTFL remains effectively unchanged relative to the baseline, though it is marginally worse. Absorption throughput improves modestly, but the gains remain small in magnitude.

Figure 4.9: TTFL and Absorption Capability, Baseline vs. Policy 3



These results indicate that the combined policy operates more strongly through inventory composition than through accelerated absorption; changes are mostly seen in experience

composition rather than in a significant change to the rates at which inexperienced pilots are absorbed. Table 4.9 displays the above differences numerically.

Table 4.9: Baseline vs. Policy 3 Output Comparison

Outcome	Baseline	Policy 3	Change
End Exp Share (%)	39.1	44.24	+5.14 pp
Mean TTFL (months)	25.07	24.92	-0.15
Pilots reaching EXP	1240	1251	+11 (+0.9%)
Avg absorption throughput (pilots/yr)	60	61	+1 (+1.6%)

Summary

Table 4.10 provides a side-by-side summary of the quantitative differences and gains associated with each excursion.

Table 4.10: Summary Comparison of Three Policies

Excursion	Δ End EXP (pp)	Δ Mean TTFL (mo)	Δ Pilots Reaching EXP (count)	Δ Avg Absorption Throughput (plts/yr)
Policy 1	+4.72	-0.25	+15 (+1.2%)	+1 (+1.6%)
Policy 2	+1.7	+0.01	+6 (+0.5%)	No Change
Policy 3	+5.14	-0.15	+11 (+0.9%)	+1 (+1.6%)

NOTE: pp = percentage points. Changes are measured relative to the validated baseline.

Across all excursions, three findings stand out:

1. Operational experience mix improves under each policy, but these gains are not accompanied by meaningfully faster TTFL metrics.
2. Although Policy 3 produced the largest improvement in long-run experience mix, it did not materially outperform Policy 1 on other summary metrics.
3. Policy 2 yields the smallest improvements relative to the baseline across all policies reported here.

Chapter 7 considers these results alongside the interview findings discussed in the next chapters and evaluates their implications for policy implementation.

Chapter 5. Engaging CAF Instructor Pilots for Critical Perspectives

Considering the career paths examined in this dissertation are personnel policies, I hypothesized that to increase uptake and decrease barriers to implementation, it is important to include the perspectives of individuals most affected by their potential implementation. Although the simulation model provides a way to examine the structural and enterprise-level impacts of alternative career paths, it cannot fully encapsulate the uncertainty of human response. Uncertainty in how Air Force members will perceive, respond to, or buy into a new policy cannot be explicitly modeled, as such characteristics are influenced by individual circumstances and career goals. For that reason, this research incorporates SME interviews as a qualitative complement to the modeling effort.

Purpose and Rationale

The purpose of the interviews was to better understand the group of individuals who have been at the center of retention related discussions for the past several decades. Specifically, this meant exploring motivations that drive voluntary participation in retention-related policies and programs, understanding the current assignment and retention landscape for pilots, and attempting to identify the barriers that personnel policies must overcome to increase effectiveness. While time and resource constraints prevented the use of an officially fielded AF survey, individual interviews offered an avenue to gather detailed insight into experiences, motivations, and perceptions that shape pilot responses to retention policy.

The interview populations can be categorized into two groups: Combat Air Force IPs and first-assignment instructor pilots. This chapter examines the perspectives of CAF IPs while Chapter 6 examines the perspectives of UPT instructors. Detailed interview protocols, including sample questions, and final interview population composition can be found in Appendix B.

CAF Instructor Pilots

In speaking with active instructor pilots, one goal was to gain an accurate understanding of the problem challenging HQ DAF policymakers as they attempt to shape the operational environment vis-à-vis implementation of new career path initiatives. In the background research and SME conversations conducted prior to designing this study, I repeatedly encountered the

same explanation for the fighter absorption issue: it is primarily a maintenance problem, not a manning problem.

To be clear, the AF is facing declining maintenance health across the aircraft inventory – the average mission capable rate in FY24 was 67.15% – and that decline directly constrains sortie generation (Tirpak, 2025). However, the consensus across interviews was that "even if you magically fixed the maintenance problem, we would not be able to fill the lines"[34]. As one interviewee summarized:

> Currently the active-duty manning is sitting between 40-60% and I have never seen it get over 60% manned but currently maintenance is the linchpin. The manning problem is masked by maintenance problem right now. They are maintenance cancelling lines that we already did not have pilots to fill.[35]

Conversations with SMEs at the MAJCOM level reinforced this view. While maintenance remains a critical constraint on sortie generation, interviewees consistently argued that improvements in aircraft availability alone would not resolve fighter absorption problems because pilot manning and experience shortfalls remain significant. The interviews suggest that maintenance and manning should not be treated as separate or competing explanations, but as interconnected constraints shaping the operational environment in which new personnel initiatives are being considered. This context is useful to examine demand for such initiatives and need for this research.

This interview population was asked exclusively about the End-of-ADSC Instructor Track. All themes relating to policy implications are therefore in relation to Policy 1 of this dissertation. The following key themes emerged from 19 interviews with CAF instructor pilot SMEs. Airframe, duty station, and rank have been removed to preserve non-attribution assured during interview recruitment. Unless otherwise indicated, the quotations in this section are from interviews that I conducted with CAF IPs in fourth and fifth generation fighter communities in spring 2026. Chapter 7 synthesizes these findings alongside the modeling effort and considers their broader policy implications.

Key theme: You cannot outproduce a retention problem.

Across the board, interviewees found consensus on the fact that "the AF has a retention problem, and they are trying to fix it from a production angle and that is not a cost nor mission effective solution." Evidence for the factor retention plays over production was highlighted by one interviewee:

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[34] "Lines" is AF term for an aircraft sortie.

[35] USAF CAF IP, video interviews with author, February 2026.

> The AF is losing experience at the top of the rank structure, and it seems like the goal, instead of trying to keep the ones at the top, they are just going to out produce at the bottom younger level.

At its core, interviewees did not describe this as a pure numbers game. Their concern was not simply that there were fewer pilots in the squadron, but that the shortage was concentrated in specific experience bands and qualifications. Across interviews, participants emphasize that units may appear healthy on paper while still lacking the experience needed to execute the mission in practice. As one interviewee explained:

> The RMD does not match what our tasking requirements are for IPs. So, per the RTM I look healthy with 5 IPs, but I am now short on experience and realistically I cannot execute the mission.

Outside of the ability to accomplish the mission, the main concern of the interviewees was the impact of where the missing manning occurs. The shortage is not evenly distributed across the force; it is concentrated in the middle cohort of experienced aviators who normally serve as the day-to-day source of continuity inside the squadron. One interviewee described the absence of that cohort bluntly:

> I am lacking in major level officers in the actual squadron. The ground level squadron where you would want the mid-level leadership to be the rock, the integrator, the experience. There is zero of that. The inmates are running the asylum at this point and a big part of that is retention not production.

Another pilot further explained the gap:

> There is the population pyramid where there are a ton of LTs and Capts and then maybe 2-3 majors and 1 LT Col. As far as IPs, it seems like the B course is overproducing and then we do not have a lot of experience being retained in the op.

Interviewees described this shortage as affecting nearly every part of the training and upgrade cycle. In their view, the loss of experienced pilots does not just reduce the number of sorties that can be flown; it also reduces the number of people available to mentor young aviators, absorb the non-flying squadron requirements, and create the conditions for quality training rather than simply generating sorties. As one interviewee explained:

> More IPs in the squadrons leads to the ability to have quality mentorship and instruction for the young folks because they are not flying every day and have time to mission prep and debrief with the students rather than just turning sortie after sortie. Having more experienced people around does not only benefit the young pilots because of the amount of sorties and upgrades that can be completed but also because there are now more people in the squadron to help with the aviation mentorship.

It is against this backdrop that interviewees evaluated the Air Force's response. The perception is to combat this missing cohort, the AF is set on increasing the number of student pilots. The UPT and FTU target throughputs have increased by shortening syllabi and sortie requirements at the introductory level. But if the Air Force is increasing the inflow without stopping the hemorrhaging occurring at the outflow, there is no one left to train this now larger group of pilots; which is larger than the group they currently cannot keep up with. The model of progression and teaching upgrades should work in theory but hits roadblocks when only one end of the cycle is adjusted. As one pilot explained:

> The IP pilot progression system should work well. You become an IP and then you spend time helping produce your own replacement. The issues arise mainly when the service tries to increase production or expecting extended retention without major structural changes.

In this way the operational squadrons "are seeing the effects of the AF attempts to correct the inflow problem by going for quantity over quality, but the burden of that ends up being absorbed at this level and higher, causing the training burden to be that much greater," and there are not enough IPs in the squadron to absorb these burdens. As one CAF IP put it:

> The manning issues are leading to fewer training lines, so we cannot produce new flight leads and instructors fast enough. Fewer upgrades being completed means fewer qualified people to teach the next generation, and that just keeps shrinking the pool of instructors.

Although the FTU is contributing to the push of the burden downstream, they are also struggling to keep up with the Air Force's demand for production:

> We are at the point that because of the low number of IPs we are unable to generate the number of students out of the FTU the Air Force says they need in the future.

In this sense, IPs agreed that there was a production issue, just not at the level the Air Force is focusing on. The consensus was that the AF "is losing talented aviators faster than they can replace them" and that there "are not enough IPs and producing them is a challenge" because "producing new ones takes enormous resources we do not have."

The challenge lies not only in the inability to produce enough upgrade lines, but also in the shrinking pool of IP upgrade candidates. The Air Force is not simply short on total bodies; it is short on the specific kinds of people needed to regenerate the force from within. It is not possible to take a fresh wingman and put them through the instructor upgrade, so the shortage is rooted in the lack of mid-career flight leads in the squadron who can enter those upgrades. In practice, this means that most operational squadrons are no longer receiving enough experienced aviators to sustain instructor production efficiently. Instead, they are increasingly forced to build that experience from the ground up. As one pilot summarized:

> We receive people fresh from B-course that need to be MQT qualified, we are not receiving inbounds of qualified flight leads to put through the program. So our flight leads and IPs are generally who we create from the ground up.

Coupled with how the AF PCS cycles are set up, once a pilot makes it through the upgrade cycle, they are close to leaving the squadron. This creates what one interviewee described as an "upgrade treadmill" that diminishes the return on investment of any IP created in ops squadrons:

> Most of the time you create a flight lead and then upgrade them to IP and then they PCS 6 months after that. You feel like you are on this treadmill of creating IP and flight leads to lose them in the coming months and start over again.

Interviewees identified several additional structural contributors to this cohort scarcity. Some questioned whether the distribution of the available manning was worsening the issue, wondering if "we are losing IPs faster than we are making them, or they are unevenly distributing them around the CAF and AETC." There was a common suggestion of consolidating B-course squadrons to redistribute the IPs back into the CAF, but that was accompanied by concerns of a larger degradation to the FTU's ability to produce new operational pilots. Consequently, a redistribution would just shift where the problem is isolated rather than solve it.

Others pointed to the way that the Air Force stands up the communities of new platforms. When the AF set up both the F-22 and F-35 communities, they needed to pull experienced instructors from the fourth-generation fighter communities to ensure there was a solid instructor and experience base for both the safety of the individual and the fleet. This drain was felt strongly in the F-16 and F-15 communities, both of which felt like "farms for the fifth-generation communities." Thus, the fourth-generation communities would expend resources and time

creating IPs just to lose them to stand up the fifth-generation communities. One interviewee explained:

> The Air Force is standing up new F 35 squadrons constantly, and they pulled instructors from across the fighter world to fill them. That vacuum has hit us hard because they are taking the seasoned and senior pilots to qualify the students in the F-35.

One interviewee validated that as of 2024, the F-35 community has officially reached the point where "the people who went straight from UPT to 35 then went to CAF are now coming back to B course so we are at the point where we can feed ourselves." Combined with the information that the first live B-course class started in early 2017, that means it took 7 years to officially "stand-up" the community (Shan, 2017). While these communities are reaching an unstable equilibrium now, one interviewee explained the ever-evolving situation of the Air Force fighter acquisition process:

> In general, there is less experience around because we are spreading the already dwindling number of fighter pilots across multiple air frames. Retention is steadily decreasing, so now we are spreading less people than 20 years ago over more aircraft than 20 years ago.

As the AF continues to invest in the acquisition of more advanced fighter technology, interviewees believed they will continue to pull from these established communities, perpetuating the already extensive manning issues. As the Air Force looks to field the F-47 in the next few years, this timeline and its effect on the already constrained fighter community makes any efforts to alleviate these shortages at the end of the pilot timeline critical.

While the lack of IPs compounds the issues set forth by the Air Force's desire to continue to up production numbers, the interviewees emphasized another key issue: the implications of who bears the burden of the pilot manning crisis.

Key Theme: There is a cycle of experience loss and burnout in fighter squadrons.

Interviewees described squadron workload as becoming increasingly imbalanced because too few experienced pilots remain to absorb the leadership, training, and administrative responsibilities normally distributed across the middle and upper portions of the squadron. In practice, they argued, this leaves a small group of experienced instructors carrying a disproportionate share of flying, teaching, and squadron management duties. As one interviewee explained:

> Another effect is that we have fewer people in the squadron who are qualified for leadership positions. So your IPs are doing all of the flying, all of the teaching, and all of the leadership while you have a bunch of wingmen sitting around with nothing do to and not enough qualifications to help with what is required in the squadron.

Across interviews, participants repeatedly described IPs as the "workhorses of all aviation communities" because they are the "ones who are qualified and certified to do the things the larger Air Force needs outside of just flying." Combined with their necessary role in upgrade sorties, this makes them the group most likely to absorb excess burden when manning falls short.

Interviewees conceded that some degree of this imbalance is a necessary feature of how squadrons function. Students and junior pilots should be focused on learning and flying, which means the rest of the squadron must absorb the non-flying demands. But the burnout does not stem simply from the natural increase in responsibility that comes with seniority. Periods of elevated operational tempo are inevitable and, at times, necessary in response to shifts in the strategic environment. What has changed is, with too few experienced pilots left to distribute the workload, those surge conditions no longer feel temporary. Instead, they have become the baseline tempo of squadron life. As one interviewee explained, "it is only okay to ask them to do that in surges, but when that is the tempo you are asking them to maintain for years, they are going to separate."

Participants often described this pattern as self-reinforcing. One participant labeled it as a "death spiral": as more pilots leave because of burnout and high tempo, fewer experienced pilots remain to carry the burden, which increases strain on those who stay and makes further separation more likely. This perpetuates a cycle of decreasing manning and decreasing squadron experience levels. Interviewees repeatedly pointed to the same core asymmetry inside squadrons. One explained:

> You end up with an asymmetric culture where you have some people who have a lot of extra free time and more seasoned IPs who are burning themselves into the ground which is not good for retention aspects, and it just becomes a negative feedback loop.

Interviewees were also careful to point out that this shortage of experience is not just a matter of counting experienced versus inexperienced pilots. The absence of IPs affects the squadron in secondary ways as those individuals are not present to fill the institutional, supervisory, and decision-making roles that normally shape the quality of training and daily operations. As one participant explained:

> Lack of IPs trickle down in that they are not there in all the 2nd order ways that they normally would be. So yes, obviously they are not there for the flying and offering expertise, but they also are not there for all of the other jobs in the squadron. The folks in the stan eval, weapons, and training shops should all be experienced but there aren't enough people so younger guys are in these positions that lead to maybe less effective decisions and policies and they have to mitigate this risk with more restrictions to policies that do not allow them to do higher end training. This provides a feedback loop for a less experienced squadron in general.

A common frustration mentioned in interviews was the overwhelming amount of "QUEEP" - aviators' term for administrative paperwork and duties - those senior aviators experience in their day-to-day work. While not exclusive to the top of the rank structure, it becomes an additional burden on top of the already increased leadership and flying requirements that accompany a minimally manned squadron. Several interviewees mentioned that although civilian help exists to ease these burdens, there are not enough civilians, and they are not distributed effectively enough to make a meaningful impact. One interviewee summarized this tension well:

> We are not using the contractors and civilians as much as we could for certain additional duties at the squadron group or even wing level. And I am not sure if there are not enough of them or if we are not putting them in the right spots, but they need to be better managed. We have a squadron with 6 shops and only 2 of them have one contractor each so that means the pilots are fulfilling the duties in the other shops without any support.

The general consensus was that these auxiliary jobs "require a tremendous amount of time and effort and have nothing to do with being an instructor pilot in any capacity." The problem was not only that these duties consumed time, but that they precluded the kind of flying that sustains proficiency and job satisfaction among the most experienced aviators in the squadron. Since the ground duties still need to be accomplished and the upgrade training still needs to be completed, the training that takes the hit is often the individual's own aviation development. As one IP explained: "Last month all of my scheduled sorties were filling the instructor seat, no continuation sorties."

This tension between constant upgrade cycles and non-flying duties was one of the clearest sources of frustration among the IP cohort. One interviewee described it succinctly:

> You are always in an upgrade cycle so there is no free time, especially with the additional duties. And as an IP if you are constantly doing upgrades, it takes away from your ability to go up and work on your own skills which you can see start to atrophy after a while.

There was widespread agreement that while "money and stability matters, so does quality of life and job satisfaction." Interviewees emphasized that the issue was not senior pilots disliked working hard, nor were they unwilling to carry greater responsibility. Rather, the frustration came from being pulled in too many directions to do any one part of the job well, especially the part that brought them into military aviation in the first place. As one interviewee explained:

> Risk of burnout among the IP cadre, because they are being pulled in a lot of different directions and it makes IPs hate their jobs because they love instructing but they no longer have the time to devote to actually making their students better.

Others described the same process in terms of what gets lost as administrative and instructional demands accumulate. The heavy administrative and training burden "takes away from the excitement of flying." As one interviewee put it:

> When flying starts to feel like a job people are going to get out, and the lack of IPs is making it so that those who did stay feel the pressure weight and demands of this job heavily.

The calculus pilots go through in assessing whether all the competing demands placed on them are acceptable, becomes more acute the further into their careers they get. Eventually, as one interviewee described elsewhere, they "sit down and realize the juice is no longer worth the squeeze." The important implication embedded in that sentiment is at one point, the juice was worth the squeeze. Interviewees suggested this occurred when squadron life still offered a more sustainable balance between flying, teaching, and the non-flying demands of the job. As that balance deteriorates, so does retention.

One interviewee summarized the retention side of this "death spiral" particularly well:

> When looking at the retention thread maybe it is less about how busy people are but more so that the longer you are an AF pilot, the less focus and time there is for flying. The extra duties take over which leads to lower job satisfaction and as you stay in longer the enterprise's path points towards higher level, non-flying, positions, whereas that is not always the goal for the individual pilot.

Taken together, the interviews suggest that most pilots do not leave because of flying itself. As many participants emphasized, flying is the part of the job they still love. "It is not the flying that is burning people out and causing higher rates of separation, but the lack of people to carry the weight and the burden left in their absence." That distinction is important because it helps explain why career aviation tracks remain such a popular concept among the fighter pilot

population: they can be seen as a way restore a better balance between flying and everything else that increasingly drives experienced aviators away.

Key theme: Stability, control and job satisfaction outweigh monetary incentives alone.

Interviewees consistently described Air Force retention efforts as relying too heavily on monetary incentives to solve what they viewed as a broader quality-of-life problem. Across interviews, participants emphasized, while compensation matters, stability, control, flexibility, and job satisfaction more often shaped their retention decisions. As one participant put it:

> The Air Force has entered a salary arms race with the airlines; one they are sure to lose. If the military tried to significantly increase bonuses to match airline pay, the airlines would just raise their own offers. It would quickly become unsustainable for the AF and pay alone would not address the real reasons people leave.

While compensation was one of the top three reasons pilots stated as reasons for exit in the 2021 Aircrew survey, interviewees in this study more often emphasized instability in military life, lack of control over family decisions, and the cumulative burden of service demands as more decisive factors in their retention thinking.

Even when interviewees acknowledged that money mattered, they rarely described it as sufficient to change their decision calculus. One participant summarized this sentiment:

> The bonus does not move the needle at all. It provides a reward for those that were already going to stay without it.

Another interviewee similarly noted:

> For some, pay weighs heavily; for others, it's second of third behind family and quality of life. A lot of people think about the stability and flexibility that comes with leaving for the airlines, more money and more control.

Consequently, the problem for the AF is not that the airlines pay more, but that they offer a combination the AF cannot easily match through compensation alone: higher pay, greater predictability, more personal control, and a stable home base. It follows if the AF is to try to combat this career transition, then it needs to start working on the other factors behind why pilots separate, and soon. Similar to the post Covid hiring surge, airlines are predicting a massive demand for airline pilot hiring. Due to a perfect storm of expanses in aircraft fleet and aging out of the last boom of pilot hires – more than 17,000 pilots will be at the age 65 threshold by 2030

(Thrust Flight, 2025)-, Boeing predicts that by 2035, 112,000 pilots will need to be hired in US alone (Boeing, 2016). As the top recruiting pool for commercial airline hires, the AF is under a time pressure to figure out a way to retain its most experienced talent.

Outside of its inability to match the levels of industry compensation, monetary incentives also appear insufficient to service members because they are often experienced not as added value, but as a tradeoff for autonomy. Interviewers tied dissatisfaction with the AvB to the loss of control that comes with accepting it. As one participant explained, "there is a severe loss of control when signing the bonus and that is what sours most people on it." Another elaborated that:

> The Air Force's aviation bonus can be good, but a lot of people hesitate to take it because it feels like signing their life away. That worry tends to affect people with families the most. They don't want to be stuck in a long commitment that limits their control or forces them into an undesirable assignment. Being able to control my family's future might be worth more to me than the extra pay.

This sentiment and those from the previous paragraph were echoed further by another participant:

> Money is less of a factor for me, more the location preference and stability for my family is what is important so even if I chose to stay active duty, I would do so in 3-year increments without the bonus for flexibility in my personal life because the Air Force would have less control over me.

Across these interviews, the issue was not simply whether the bonus amount was attractive, but whether accepting it required too much surrender of future flexibility.

Interviewees also emphasized that retention preferences are not static over the course of a career and therefore could benefit from the existence of more choices. As one participant explained:

> Another important factor is that people's preferences change over time so while one option may look attractive in the early years of their career, their needs and desires change over time. AF should be looking for a level of stability that retains a discrete number of options that are both best for the air force and best for the individual.

Another participant echoed this sentiment:

> What would help most is offering more tailored options: some pilots value stability, others career growth, others financial incentives. The AF should create a menu of choices. This feels like the spirit of the Rated Officer Retention Demonstration Program: to break the one-size-fits-all mindset and prove that different people stay for different reasons.

These interviews suggest the appeal of retention policy becomes stronger when paired with meaningful options. Across interviews, the issue was rarely whether money mattered at all. Instead, participants questioned whether compensation alone could overcome dissatisfaction with instability, limited assignment control, family disruption, and declining job satisfaction. Interviewees repeatedly emphasized that retention preferences change over time and that different pilots are likely to respond to different combinations of incentives. As a result, many framed the broader retention challenge not as a question of how to pay pilots more, but how to provide more control, more predictability, and more meaningful choice over the terms of their continued service.

Key theme: Overcoming traditional career model barriers in career track design.

A common theme across interviews was concern about whether a specialized career track could function inside the Air Force's existing officer career model. Participants repeatedly described current career progression as structured around a traditional "up or out" pathway, arguing that officers who are not pursuing the normal promotion timeline and higher leadership position are often pushed toward separation. In that sense, interviewees did not see the challenge as simply creating a new option, but creating one that could survive inside a personnel system still organized around a narrow definition of career success.

Across interviews, there was broad agreement that the AF would need to move away from the "up or out" mentality because this policy does not fit neatly within, and neither do the members currently serving. One participant summarized this tension directly:

> The Air Force mentality is up or out and not a lot of people want to go up anymore. They want all service members to fit the mold that "everyone is going to chief of staff of the air force," but that isn't even logistically possible, so why are they not looking into other ways to leverage talent and retain individuals?

Interviewees also framed this issue in broader generational realities. Several argued that the Air Force is recruiting and trying to retain officers whose preferences do not align with a rigid one-size-fits-all career model. In their view, this was not a call to abandon institutional needs or

turn the personnel system into “the self-service,” but instead, a recognition that the “Air Force must be able to maneuver within constraints beyond their control” if it hopes to retain talent.

Participants repeatedly emphasized this tension would need to be addressed if the program is to succeed. As one participant explained:

> Historically, the AF’s career model has been very rigid, with strict timelines tied to promotion and leadership potential. To make this program effective, the AF would have to change how it views senior leader development. The real priority needs to be offering flexibility rather than forcing everyone through the same timeline.

Key Theme: Addressing institutional distrust prior to policy implementation.

When discussing the proposed program, one of the most immediate responses after initial interest was skepticism that the Air Force would implement it as promised or preserve its benefit over time. Even among those who liked the concept, there was little confidence that the enterprise would execute it consistently. As one interviewee put it, “The career path sounds attractive, but I would look them dead in the eye and say I do not believe you.” Another explained that “you need to make it clear cut and contractual so that you can get over the mistrust embedded in the fighter community.”

A third interviewee described how easily they could imagine the program being altered after members had already committed:

> I could very easily see the program running for a few years and then the AF saying ‘we have to send you somewhere else’ and you do not get a choice or the policy changes and you are at year 18 and they make you PCS after 4 years in place to a non-flying staff job.

Together, these reactions suggest that the primary barrier to uptake was not necessarily opposition to the concept itself, but a deeply rooted distrust of the institution offering it.

This distrust was often described in personal terms. Interviewees expressed feelings of being “trapped” and “manipulated” by the Air Force, particularly in cases where earlier policies asked for long-term commitments and then changed the incentives, standards, or outcomes after members had already opted in. As a result, the Air Force is attempting to introduce another long-term career commitment while fighting an uphill battle against the mistrust that prior decisions have created. The skepticism surrounding this program is therefore best understood not as a reaction to this initiative alone, but as the cumulative result of earlier experiences in which the Air Force set expectations and then failed to sustain them.

Interviewees traced this mistrust to a broader pattern of Air Force inconsistency that extended well beyond this program alone. As one participant summarized, there is "a lot of distrust in the enterprise as a whole." Rather than describing one singular failure, they pointed to repeated experiences in which the AF has broken their trust.

Examples raised across interviews included the fluctuating structure of the AvB, the recurring masking and unmasking of individual attributes at promotion boards, changing signals about the value of in-residence developmental education, and the AF's inability to remain consistent in deployment models and force posture. Interviewees specifically referenced recent shifts between agile combat employment (ACE) operations and Air Force – Force Generation (AFROGEN) deployment cycles as evidence that the AF often introduces reforms without sustaining them long enough to build trust. These cases formed the backdrop against which interviewees assessed the proposed program and help explain why many were reluctant to trust that specified benefits would endure. As one interviewee put it, "the only thing consistent about the Air Force is that it is inconsistent."

One example of this distrust appears in the rank-based promotion system. The AF relies on a time-in-service and merit-based promotion structure intended to be transparent and incentivize officers to pursue both professional and educational qualifications. However, the transparency of the board process has become a source of frustration rather than clarity. In trying to clarify the "gates" officers must meet, the AF has instead created what the interviewees perceived as a constantly shifting set of expectations. Interviewees repeatedly described the masking and unmasking of qualifications at promotion boards as telling of a system that creates a "rat race" without stable rules.

The master's degree requirement was one of the examples given as repeatedly shifting between masked and unmasked. For officers trying to plan several years ahead, this is not a trivial change; earning a graduate degree requires substantial time and effort and cannot be adjusted quickly in response to unpredictable changing policy signals. When officers organize their careers around one set of assumptions and the AF suddenly changes the standard, interviewees said it makes service members "lose motivation to be a competing member of the rank-based structure the AF has established." Similar concerns surround institutional and senior development education requirements (IDE and SDE), especially the varying signals the AF sends about which kinds of programs matter most and how they are valued on promotion boards.

The AF requires officers seeking continued career advancement to complete these IDE and SDE programs, either through the AF's schoolhouse in Maxwell, Alabama, sister-service school houses, commercial partner programs, or remote programs. Although multiple paths exist, interviewees described a known preference at promotion boards for "in-residence" programs, making those programs especially competitive. Historically, top performers were matched with non-AF in-residence schoolhouse, which many interviewees described as both a reward and a reprieve from high operational tempo assignments for themselves and their families.

That expectation was disrupted in January 2025, when the Air Force announced that it would vector the top 1/3rd of applicants through the Maxwell schoolhouse (Allvin, 2025a). Interviewees said this change felt punitive because of the general dislike of the schoolhouse's location coupled with the fact that it affected the officers who had done the most to meet the institutions stated expectations. One participant captured this frustration by arguing that "when the top 1/3rd of people's personal priorities do not align with the AF's desires, they essentially screw over the top performers." In effect, the Air Force has encouraged competition for development opportunities, clearly signaled these programs mattered, and then altered the reward structure in a way that made high performance feel punitive rather than rewarding. Since these interviews were conducted, the DAF rescinded this January 2025 change, further validating interviewee's perception that the institution is often unable to provide stable and consistent long-term plans and programs (Wilsbach, 2026).

This 18-month period of re-vectored assignments reinforced a broader belief that the institution could not be trusted to preserve the initial value of programs and policies it urged its members to pursue. Some interviewees described a cohort that felt undervalued and under-appreciated and ultimately unable to realize opportunities that predicate longer service commitments than the initial 10-year tour. In trying to elevate its own schoolhouse despite known dissatisfaction with the Maxwell location, the DAF was perceived by interviewees as undermining confidence in the very command-development pathway it was trying to sustain (Hanser et al., 2021).

Distrust also extends beyond career development and into readiness and operational policy. Interviewees described how repeated changes to deployment models and force-posture constructs create turbulence not just for career planning, but for unit training and readiness as well. Constantly adapting to new models that are subsequently altered or abandoned creates fatigue and skepticism. The AFROGEN construct was a common example. Participants noted that when the model was introduced, it was welcomed because it would offer consistency and predictability around TDYs and deployments. In theory, AFROGEN would place units on defined deployment and training cycles, allowing families and individuals to better plan around the demands of Air Force life (SECAF PA, 2023).

In practice, however, interviewees said the model has not delivered on its promises. As one pilot explained:

> The concept in general would be great for providing stability for knowing when you would be pulled to deploy, but up to this point it is ineffective and frustrating because ultimately, they disregard the policy and find people regardless of if they are in the deploy cycle or not.

This gap between intent and reality was central to the distrust expressed in interviews. The problem was not necessarily the concept itself, but with the repeated experience of AF announcing a more predictable system and then contradicting it in practice.

Even the AvB, a longstanding retention tool, was described as a source of frustration because of how inconsistently it has been implemented over time. Interviewees tied the bonus directly to the distrust in institutional implementation. Their frustration centered on the fact that the same program has changed substantially over a 12-year period, both in terms of bonus entitlements and in how different aviation communities are prioritized. One participant argued that when the Air Force makes major deviations to the same program over time, it "breaks trust and disincentivizes someone reaching the end of their ADSC. It creates little fractures in the trust tree."

This unpredictability is damaging because service members do not make bonus decisions at the point of signing. Decisions are shaped by expectations built over years. Interviewees emphasized how difficult it is for aviators to plant heir future in the AF when they "watch the cohort of aviators above them offered $35,000 but when it comes time for them to take it, they are only offered $15,000." The same work and career commitment is valued differently across close cohorts.

The issue is not only the dissatisfaction with the lower bonus amount, but also the inability to rely on any stable expectation. If aviators believe the terms of retention incentives change dramatically by the time they reach their decision point, they may conclude that long-term planning within the Air Force is futile. This helps explain the interviewees broader skepticism toward the proposed policy; if aviators already view the retention bonus as "the devil's money," then any program closely tied to bonus acceptance is likely to carry such negative perception.

Alongside frustrations with policy inconsistency, interviewees repeatedly described assignment processes as a "black box." The strongest complaint among interviewees was that their preferences were solicited but did not meaningfully influence outcomes. Participants described the only meaningful influence on assignment outcomes as coming from "grassroot efforts by squadron commanders to game plan their people's career. This provided a peak behind the curtain into what the next few years' worth of assignments looked like." At the AFPC level, however, interviewees felt these conversations and efforts disappear. One interviewee summarized the assignment mistrust well when they said:

> The consensus with people is that when you sign an ADSC, you are signing with a lot of uncertainty, and you are giving your service away for the Air Force to do pretty much whatever they want with no guarantee that they are going to uphold their end of the contract. They may promise you an assignment, but it seems like they reserve the right to change at any time.

Another commented that:

> The Air Force can pull the rug out from underneath you at any time and strong arm you into doing an assignment you did not want when the part they promised would work out does not work out.

Taken together, these examples show that distrust in the Air Force is not rooted in resistance to change itself, but in repeated experiences in inconsistency and opacity. Across promotion policy, developmental education, assignment systems, and retention initiatives, interviewees described the same basic pattern: the Air Force announces a policy, encourages members to align their behavior with it, and then changes course, or fails to execute it as promised. As several participants suggested, the memo changes but the environment and real systems do not. If the Air Force wants to implement successful programs, it needs to "give pilots expectations and then stick with it." Ultimately, "the most important part of this system [the AF] is that you cannot go back on the positive things that you put in place." One of the last pilots interviewed summed up the sentiments nicely:

> Ultimately, all of these policies take rates come down to the same question which is "Is the Air Force going to screw me over on this one?" and I think most people's opinion right now is, yes.

Key Theme: Active-Duty career tracks compete with Guard and Reserve Opportunities.

Although the Air Force Reserves and National Guard are distinct enterprises operating under separate commands, their incentives and accession strategies influence active-duty retention within the DAF's Total Force Initiative. To reduce training costs and burden, the Reserves specifically aim to fill approximately 70% of its manpower requirements through prior active-duty separations and 30% through entry-level accessions (Roza, 2025). In the aviation community specifically, Project Air Force found that 74% of separating active-duty pilots ultimately transitioned to flying positions in the Air Force Reserve and Air National Guard (Robbert et al., 2015), and as of 2016, 60% of separating pilots affiliated with the Reserve component (Rosello et al., 2016). While Reserve affiliation rates have declined in recent years, mirroring broader declines in active-duty retention, the Reserve and Guard remain a significant destination for pilots leaving active duty. Consequently, active-duty retention initiatives should be evaluated in a Total Force context, given the Reserve components' continued reliance on recruiting from the active-duty pilot population.

Interviewees in this research reinforced that logic because they did not evaluate the proposed career track in isolation. Across the interviews, the policy was almost immediately compared to

existing Guard and Reserve opportunities, particularly the instructor-style billets already available at certain locations. In some form or another, all 19 interviewees mentioned the equivalency of this career track with the Guard and Reserve positions available at certain bases. As one interviewee put it, "this idea seems to match the guard and reserves concept which works well."

That comparison was not just at the surface level. Participants repeatedly described the proposed career track as an attempt to recreate, on the active-duty side, an option that already exists elsewhere in the Total Force. In doing so, they also highlighted the vacuum that currently exists on active duty for pilots who want to remain in a flying-focused role without continuing along the traditional command path. As one participant explained:

> The Air Force does not do a fly-only track and I am a firm believer that they should, the closest option to that is the guard and reserves which is why so many people go there after their initial commitment.

This demand signal appears to be surfacing earlier in pilots' careers than in the past. Interviewees noted that younger cohorts are discussing Guard and Reserve options much sooner, suggesting both growing awareness of those alternatives and declining patience with the active-duty career model. One interviewee summarized the trend this way:

> There is a lot more saltiness earlier on in the ranks, it used to just come in the form of 18-19 year FGOs who were biding their time to get out but now it is down at the 10 year level who have already applied to the reserves and guard and are getting out. Our wingmen feel like that is the cultural norm so it just eventually perpetuates.

Another participant described the same phenomenon more simply as "pilots starting to look at their exit opportunities earlier on." Together, these responses suggest that the proposed career track cannot be measured in a vacuum. It is being measured against existing opportunities that are already well understood by the population the Air Force is trying to retain.

Still, interviewees were not unanimous about how attractive they found the active-duty version of this concept. For some, the similarity to the reserve model was the exact appeal. One participant said, "it is like being a permanent active-duty reservist which would be awesome and I would sign up right now." For others, that same similarity raised the opposite question. As one interviewee put it, this "sounds like the guard and reserve capacity at FTU, why would I do the same thing active duty?"

That tension reveals an important point: the issue was not whether the concept itself was attractive. In concept, most interviewees described the appeal of the Guard and Reserve path in similar terms. It satisfies the desire to remain in a flying position indefinitely and avoid being

pushed into a version of career progression they no longer want. As one interviewee explained, "I got into this job to fly, not lead. I do not want to be a colonel that is not flying." Interviewees also agreed that the reserve structure eliminates many of the biggest pain points, "there's no vulnerable to move list, no mandatory PCS requirements, and you can stay permanently attached to one local squadron." Those are all concerns the proposed active-duty career track is also trying to address.

But if the active-duty version is conceptually similar, it is worth understanding why some interviewees viewed it as less attractive. This understanding would help strengthen the policy. The answer centered on what the reserve and guard pathways still offer that active duty does not: a more flexible service commitment and the ability to "double dip." Double dipping refers to the ability of Guard and Reserve aviators to maintain jobs at commercial airline companies while also contributing to the Guard and Reserve squadron. Other forms of double dipping include jobs at contracted simulator companies and other commercial enterprises, but the main point is the ability to work two jobs freely. Specifically on the commercial airline side, the ability to join the company and receive a "line number" before returning to reserve duties is crucial for career advancement in that sector.

Interviewees repeatedly identified that mismatch as a major weakness in the proposed policy. One stated:

> A 6-year commitment is a lot to ask if you are trying to keep people from doing this exact same thing as the reserves/guard position. It is important to get your line number in the airlines early.

Another tied the issue directly to the likely target population for the policy:

> If the goal is for more instructor pilots to stay in the force, in the short term by tacking on an ADSC they are going to achieve that but I think in the long term, they are going to lose out. Most of the individuals that would be enticed by this policy are the ones who want to go do it as guard and reserve because they also get to start their airline training

The idea that the target population was often the same population pursuing airline careers was common across the interviews and is important because it means the proposed active-duty track is not simply competing with civilian separation. It competes with a very specific and already functional alternative: Guard/Reserve service plus airline seniority accumulation. One interviewee summarized that tension well:

> The AF is missing a golden opportunity because most people leave active duty to get a line number, not because they hate AD, hence why so many end up in the

> reserves. They need to look into how to let pilots build up seniority in the airlines while staying active duty.

At minimum, interviewees believed that any active-duty version of this concept would need to be evaluated against the flexibility, stability, and outside-career opportunities already associated with the Guard and Reserve service. Some even questioned whether the best answer was to expand Reserve capacity itself rather than try to recreate it on the active-duty side. As one interviewee argued:

> Expanding reserve units or increasing their capacity at key locations would create a natural pathway for experienced pilots who still want to contribute but can't or don't want to move constantly. It's a simple, sustainable retention tool that preserves highly skilled instructors while giving them the stability they need.

But even if the Air Force chooses to pursue the active-duty track rather than expand Reserve alternatives, the implication from the interviews is the same: this program will not be judged on its own terms. It will be judged against the existing Guard and Reserve model, against the flexibility those components provide, and against the broader Total Force environment. An environment in which pilots already have other ways to keep flying, gain stability, and build a future outside the traditional active-duty path. With some consideration for how the other arms of the total force initiative (TFI) model conduct their retention initiatives, the active-duty side may be able to extend the offerings of this career track to satisfy those same demands.

Key Theme: Assignment location is a critical factor in career-track uptake.

While stability is important, where that stability is offered appears to be the deciding factor for most participants. Interviewees who reacted positively to the proposed program or indicated interest in taking the track immediately qualified that support with some reference to location. The initial reactions followed the same pattern: "The career IP track could be a cool option, but it really depends on location." Another echoed the same point, saying, "I think there is some draw to the career IP track, but it all comes down to what location."

As interviews progressed, it became clear that the location issue was not simply a secondary preference layered onto an otherwise attractive program. Rather, location was often the threshold condition that determined whether the program was attractive at all.

Although the policy was presented as an assignment back at FTU or UPT, most pilots discredited the UPT option when answering questions. In trying to unravel the bias interviewees displayed toward FTU over UPT, it quickly became apparent that the preference was not primarily about mission set, but about basing. As one participant explained:

> Location is more important than aircraft, people will go where they want to go and they will fly what is there. Often the personal preference on mission is lower down on the priority list than getting a good spot for my family.

Another interviewee made the same point in even more direct terms:

> For me personally I think that location preference is more important than aircraft choice. At this point it is not just about me, it is about my family and what is good for them. I will fly anything if it is at a location that is good for all of us.

Several participants were more pointed in how they described the disparity between FTU and UPT:

> It goes without saying that you would have a lot more interest in the UPT side if the bases were in better locations.

That sentiment was reinforced by a broader observation about the policy's overall take rate:

> There are tons of people that I know that would love the career IP track. the idea of a stable predictable 6-year assignment that allows them to make life plans for them and their dependent. I think the barrier to this being a successful thing is that your pilot training bases are not in great places. FTU are better but still.

Even so, interviewees also made clear that not all FTU locations are insulated from this same problem. In some communities, particularly the F-16 community, the FTU carries many of the same location disadvantages that make UPT unattractive. This came through especially strongly in discussions of Holloman:

> Holloman being the location that people would have to end up at for 6 years of FTU is dismal. The school system and ability for wives to have jobs is nonexistent so if you are targeting families that might be the one population that would not want to take this track. So, there are people who would say no solely because of the location.

Of note, all F-16 pilots mentioned the issue with Holloman basing. It has quickly become the hardest base to staff and "AFPC is getting smart and sending the younger guys who cannot 7-day

opt"[36] as there is no one else left. At the same time, even this example reinforced that location is deeply personal rather than universally fixed. While many interviewees cited Holloman as a deterrent, a few conceded it would be their first choice if it aligned with their Joint Spouse priorities or gave them proximity to aging family members.

That same subjectivity showed up across the UPT bases as well. Although there was broad agreement that UPT bases generally offered the least attractive locations, there was little consensus on which specific base was worst. Del Rio and Enid came up frequently, but others indicated they would turn down the program only if offered at Columbus. The point was less that one base was universally undesirable than that each pilot was filtering the program through their own family and life circumstances. That tension is visible in the contrast between broad community perceptions—such as "you do not have people fighting over each other to go back to Enid or Del Rio" or "everybody hates Laughlin"—and the far more individualized way one interviewee described the same decision:

> If someone said, 'You can be a guaranteed instructor for six years and won't have to move your family,' my first question would be, 'Where?' If they said Vance, I'd say no—that's not happening. I trained there and know what that means. If it were Randolph in San Antonio, though, I'd do it in a heartbeat since I'm from Austin. Laughlin I might think about, but Columbus would be a no.

These points highlight the root of the theme: location preference is personal, so the program's success depends less on whether a base is universally desirable than on whether service members feel they have meaningful choice over where they take the assignment. One location may be a nonstarter for one aviator and a dream assignment for another. There were F-15 pilots who were excited at the notion of staying at Seymour Johnson AFB because of their children and family ties, while another said that would be the biggest deterrent to taking the program because of their spouse's employment and family situation.

For some, "location choice would be non-negotiable with my family circumstances," while others emphasized that "the next biggest point is that you would need to be able to pick where you are going." Without that control, even an otherwise attractive program lost much of its appeal, especially if members feared they could "sign up for this and then be told ok, great, you are going to the last place on your list." Overwhelmingly, interviewees consistently described location as one of the biggest incentives the Air Force could offer because it is one of the clearest ways to address family quality of life concerns.

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[36] 7-day opting refers to a service-members ability, after their ADSC expiration or within one year of its expiration, to decline a PCS assignment in favor of separating from the Air Force. Upon official notification of assignment, service members have seven days to decline or accept (DAFI 36-2110, 2026).

Of course, the Air Force still must fill "undesirable" locations, and interviewees generally recognized that reality. The issue, then, is not whether those bases should be manned, but whether the Air Force is willing to acknowledge that some locations impose greater personal and family costs than others. For many participants, that made location one of the most meaningful incentives the institution could offer.

Ultimately interviewees believed, "If you make staying active duty as painless as possible you will retain more people and I think the biggest part of that is let people live where they want to live."

Key Theme: Policy changes may cause unintended effects on non-targeted pilots.

Interview data suggests a changing dynamic regarding favorable assignments in the CAF. In recent years, ops-to-ops assignment moves appear to be declining as the standard pathway. In some communities, pilots are now actively seeking ops-to-FTU assignments to as a temporary reprieve from the operational tempo and workload associated with CAF squadrons. One interviewee summarized this cultural shift:

> A big change in the past 10-15 years is that it used to be a point of pride to stay in the CAF for your entire career and people avoided going back to teach at the FTU, but now I think that people seek out an FTU assignment because it gives you a few years of non-deployability and stability/predictability.

Across interviews, predictability and stability emerged as the primary drivers of this shift. Some aviators described FTU assignments as a necessary "break from the ops tempo." Whether due to unpredictable schedules or frequent deployments, interviewees emphasized that "there is a lot of real burnout form the ops side of the house." Several participants contrasted the pace of FTU and UPT assignments with that of operational units, noting that the "slower pace at FTU and UPT" stems from a set flying schedule and a more stable mission structure. As one interviewee explained:

> Ops is a different beast than FTU because you have a less predictable flying schedule and higher stress for creating mission planning for real world operational training whereas at the FTU everything is based on the syllabus.

Within this context, FTU assignments appear to function not only as developmental or instructional tours, but also as informal mechanisms for managing burnout. Interviewees suggested that these tours may not prevent burnout entirely, but they can lessen or delay it at the individual level. One participant described this as "one of the classic ways that pilots were trying

to avoid trying to avoid the inevitable burnout," while also noting that, under current manning constraints, "it is not always feasible anymore, so you have a lot of senior guys going ops to ops." This distinction is important. These assignment preferences do not appear to be strongly shaping AFPC assignment decisions, but they do exist as meaningful cultural understandings among pilots. As the AF seeks to develop more innovative retention policies, these grassroots perceptions may be important to both policy design and implementation.

This theme also points to a potential unintended consequence of the proposed policy. By changing pathways into FTU assignments, HQ DAF may improve retention for one cohort of aviators while undermining retention for another. In attempting to retain aviators who may not otherwise remain without this policy, policymakers may simultaneously alienate aviators who view FTU assignments as a temporary reset before returning to the CAF. Interviewees repeatedly identified this as a major drawback. As one participant stated, "you are potentially removing the outlet for people who just want a break from ops." Another interviewee described this tension clearly:

> A big drawback for the community would be if you got rid of the option for normal pilots to do a tour at FTU, I see this option being attractive for older pilots who are burnt out in ops and want stability and to provide value for instructing but then you alienate the people who just wanted a small break before going back to ops.

These interviews suggest an inherent tension between the cohorts of aviators the DAF seeks to retain. A policy designed to help one group may inadvertently push another group away. Although no personnel policy will satisfy all stakeholders, incorporating the perspectives of those who will be affected by the policy may help mitigate unintended consequences. At minimum, doing so allows policymakers to identify areas of risk and conduct some degree of risk analysis prior to implementation. Many of these responses reflected a willingness among pilots to help inform the design of the policies that affect them.

Key Theme: Individual retention preferences require flexible policy options.

Across interviews, retention preferences were described as highly individualized. Although many participants found the proposed career track attractive in concept, they emphasized that its appeal would depend on how well its specifically aligned with individual career timing, family needs, and assignment preferences. Interviewees generally felt while the policy, as currently envisioned, addresses several of the quality-of-life concerns discussed throughout the interviews, its appeal could be strengthened by building in more choice.

One common suggestion was "making the policy have different tiers of commitments because it is always going to be better to give people more control over their lives." Others

proposed allowing service members the option to relocate to a different base within AETC midway through the commitment. Although the specific recommendations varied, they all pointed to the same underlying preference: service members want more options and more ability to align their service with their personal circumstances.

In that sense, interviewees repeatedly framed the policy's value not in terms of whether it would work for everyone, but whether it added another meaningful option to a force that increasingly demands more individualized retention tools. As one participant explained:

> It is impossible to create a program that makes everyone happy. If you allow flexibility, more people are going to be inclined to consider their options. More options and flexibility are the way to win people over.

This logic helps explain why participants often described the proposed career track, along with newer efforts like CAIP, as a "step in the right direction." The broader point was if the Air Force hopes to improve retention, it will need to move beyond one-size-fits-all approaches and recognize that different people stay for different reasons.

Interviewees were also realistic about the fact that targeted policies like this one may have limited reach. Several noted that such tools are only likely to fit particular people at particular moments in their careers. As one participant put it:

> These are tools but they come with the caveats of really only being for specific people and completely dependent on timing and how perfectly it fits into individual plans.

But interviewees did not view that limitation as a reason to dismiss the policy. On the contrary, many saw value in the fact that it could help retain specific people who might otherwise leave, even if it did not transform the broader manning picture on its own. One participant summarized this point well:

> The win of this program is that you target the people that were on the fence about leaving but did not really have any career progression moving forward because tactically they would not have upgraded but you could still use their expertise at training units

From that perspective, it may not be helpful for policymakers to measure the success of the policy large-scale take rates. In a force environment where experience is scarce, even small gains were seen as worthwhile. As one interviewee explained:

> I think any amount helps. Even if this only enticed a couple people maybe it would not be too noticeable on an emotional level, but it would make a big difference manning wise in a situation where every person is critical.

Another made the same point more bluntly:

> If the goal is just getting a few people, some semblance of retention then it is probably a win, especially versus not doing anything anyways.

Interviewees generally did not expect a program like this to appeal to everyone. But they also did not view limited applicability as a weakness. Instead, many argued that in a force environment where experienced aviators are scarce, even policies that retain a small number of additional instructors could still provide meaning value.

Across the interviews, the broader preference was clear: retention tools are more attractive when they provide real flexibility, credible commitments, and multiple ways for pilots to align continued service with changing personal and professional priorities.

The following chapter explores the findings from the second interview population: FAIPs.

Chapter 6. Perspectives from the Training Pipeline - First Assignment Instructor Pilots

Several key themes emerged from the interviews with FAIPs and mid-career instructor pilots serving white-jet tours at UPT. This interview population was asked exclusively about the Career-AETC Instructor Track. All themes relating to policy implications are therefore in relation to Policy 2 of this dissertation. Although the proposed career AETC track is distinct from the current FAIP model, the existing FAIP assignment represents the closest institutional analogue within the Department of the Air Force. Because FAIPs would also constitute a primary target population for such a policy, their perspectives provide a useful starting point for understanding the barriers and incentives participants associated with a potential career AETC track. These themes are presented in a sequence that first establishes the current state of the problem as experienced by participants, then examines the factors they identified as contributing to that condition, and finally considers their reactions to the prospect of a career AETC pathway. Organizing the findings in this way provides important context for interpreting participant motivations, concerns, and policy preferences.

Understanding participant perspectives also requires some brief background on how the FAIP assignment process is structured, since many of the frustrations and tradeoffs described in the interviews were tied directly to timing and sequencing of this career path.

At the conclusion of pilot training, students rank their desired MDS assignments, after which AFPC allocates aircraft slots and squadron commanders make final assignment decisions based on both student preference and class standing. FAIP assignments are included among these possible outcomes. Historically, students completed training in their assigned track and then returned as FAIPs to instruct in the T-6, T-1, or T-38. Following the divestment of the T-1, however, a new “direct-to-PIT-from-T-6” FAIP pipeline emerged. Under this model, students who complete the T-6 syllabus may proceed directly to Pilot Instructor Training (PIT) and then return to teach in the T-6. As a result, the T-6 track is now universally assignable, and upon completion of a three-year FAIP tour, these pilots may either continue to T-38 follow-on training or proceed directly to the B-course for a heavy platform. At the conclusion of their three-year FAIP tour, FAIPs enter a separate assignment process in which they compete against other FAIPs for follow-on aircraft assignments. This timeline structure provides important context for interpreting participant perspectives in the discussion that follows.

The following key themes emerged from 17 interviews with FAIPs and white-jet tour instructor pilot SMEs. Airframe, duty station, and rank have been removed to preserve the non-attribution assurances provided during interview recruitment. Unless otherwise indicated, the quotations in this section are from interviews that I conducted with FAIPs at UPT in spring 2026.

Chapter 7 synthesizes these findings alongside the modeling effort and considers their broader policy implications.

Key Theme: Negative perception of FAIP assignment driven by location, work-load, and delayed career progression.

Among the 13 FAIPs interviewed, 8 reported placing FAIP assignments at or near the bottom of their preference lists during UPT. One participant recalled,

> I think there were 32 things I could rack and stack on my list and I put T-38 FAIP 26 range and T-6 FAIP 29 range. So, to be brutally honest, I did not want to be a FAIP.

Of the 5 who ranked FAIP more favorably, 3 described doing so primarily as a means of "biding their time" in hopes of later securing a preferred fighter assignment, particularly the T-38. As one participant explained, "the sole reason people put FAIP now is because they are trying to keep the fighter dream alive." More broadly, the dominant sentiment across interviews was that "I did not want to FAIP, most people do not."

Only two interviewees described actively competing for a FAIP assignment for reasons unrelated to eventual aircraft access, both citing the appeal of a role perceived as more compatible with family stability. Even in those cases, the attraction of the assignment was tied less to the instructional mission itself than to the broader lifestyle characteristics associated with the role. This raises the issue of why the FAIP track is widely viewed as undesirable.

Across interviews, the most immediate and consistent explanation was location. Participants routinely linked their negative perception of FAIPing to the prospect of remaining at or returning to a UPT base, especially one viewed as geographically isolated or otherwise undesirable. Another interviewee similarly summarized the broader culture surrounding the assignment:

> Classically, everyone is sort of against the idea of FAIPing and they try to avoid it at all costs because they want to leave Del Rio.

Frustration with the location of Laughlin Air Force Base, was especially pronounced. Even participants stationed elsewhere expressed sympathy for those assigned there. As one noted, "Columbus has grown on me, but I shed a tear for our brothers in Del Rio." Another interviewee emphasized that even proximity to family in Texas did not outweigh the perceived disadvantages of Laughlin, stating that despite having family in the San Antonio area, they still preferred the southeastern UPT bases.

Although Laughlin drew the strongest criticism, participants did not speak especially positively about other training locations either. One respondent paired their lack of interest in

FAIPing with the observation, “I did not want to stay in Columbus for 4 years.” These interviews suggest broad agreement that “these UPT bases are not in the most attractive places,” and that geographic location is central to the negative stigma attached to FAIP assignments.

Beyond location, participants also described the FAIP role as demanding, with a consistently high operational tempo. A common view was that in this assignment, “you will not work less than a 10-hour day and the day is just flying nonstop.” Many interviewees characterized the work as both physically and mentally draining, while several used vivid language to describe the pace of the job, referring to it as a “meat grinder” and describing instructors as being “raked over the coals,” particularly because FAIPs are widely seen as the “workhorses of the squadron.”

Participants further emphasized that the challenge of the assignment extended beyond flying. In addition to a demanding sortie schedule, FAIPs carry extra duties and administrative responsibilities that provide a challenging work-life balance. Notably, three of the interviews had to be paused and resumed later because scheduling changes required the interviewees’ immediate administrative attention. As one interviewee explained:

> The 12-hour days of at least two flights, sometimes three, a day gets exhausting pretty fast and then on top of that we have all of the extra duties.

Several participants noted that MDS pilots returning to white-jet tours often compared the assignment to a “3-year deployment” because of the sustained tempo. One respondent summarized this tension clearly:

> The most challenging part about this job is knowing that I am not doing anything operationally or deploying by still my quality-of-life sucks.

These responses suggest that participants attribute negative perceptions of the FAIP assignment to the disconnect between the intensity of operational tempo and absence of direct operational involvement.

Additionally, another common frustration was the delayed entry into operational flying communities the assignment imposed. Participants frequently described this delay in terms of a career “setback,” with many perceiving themselves as “behind [their] peers that went straight into the CAF and MAF.” One interviewee explained:

> It means three more years of kind of putting your career on hold and staying in the same place and not going into the CAF to contribute to the mission.

For those selected to continue to T-38 follow-on training, the delay could extend further.

Participants also linked this delay to the dwindling pool of future developmental opportunities. Several interviewees specifically identified Weapons School and Test Pilot School

as paths made more difficult, if not effectively unattainable, by a FAIP assignment. Because these opportunities often depend on time in airframe, operational experience, and time-in-service windows, interviewees believed that the FAIP assignment could eliminate important career options with no opportunity to compete for them. One participant described this tradeoff directly:

> I am too old to go to weapons or test school and not a lot of career tracks are open to me other than the tactics side of the house.

Although some interviewees accepted this outcome because those pathways did not interest them, many viewed it as a significant impediment. For these participants, being non-voluntarily assigned to the FAIP track meant not only delayed operational service but also reduced access to the career trajectories they had wished to pursue. This frustration was compounded by a final, recurring grievance: the perception that FAIPs lacked meaningful representation in the assignment process and were poorly positioned to compete for desirable follow-on aircraft.

Participants repeatedly described their perception as they are expected to put their careers on hold in service of the UPT mission, only to reach the end of their assignment with little control over what comes next. Some expressed disappointment that FAIP follow-on drops were often seen as no better – and in some cases worse – than the assignment outcomes available directly from UPT. As one interviewee put it:

> If you think about it getting screwed over once from the AF with the original FAIP assignment and then the second time they do you dirty is the FAIP drops that are the same or sometimes worse than student drops.

This sense of being "screwed over" was closely tied to a broader perception of inadequate representation within the personnel system. Interviewees repeatedly stated they felt they "do not have a voice" and lacked "any control or autonomy over [their] careers." One participant summarized this relationship clearly:

> A lot of people get burnt out because even if you are putting in the hours, you will more than likely not end up with a favorable assignment even though the AF forced you to take this position. There is no one at AFPC specifically fighting for the FAIPs and so it is just the commanders battling it across all the UPT bases for the drops.

In these interviews, participants referred specifically to the absence of a dedicated functional manager at AFPC. Because FAIPs occupy a temporary holding category outside the normal post-UPT assignment structure, many believed they lacked the institutional guidance other

communities receive. Interviewees saw this as detrimental to their career progression because future assignments depended more on the ability of current commanders to advocate on their behalf than normal UPT drops. As one participant noted, the three-year FAIP tour often exceeds the typical two-year squadron command tour, meaning many FAIPs effectively "outlast their squadron commanders," the very people trusted to further their career aspirations.

This inability to communicate directly with AFPC representatives about future options, combined with reliance on rotating local leadership for advocacy, appeared to intensify frustration with the FAIP assignment. For many participants, the issue was not simply that this assignment delayed operational progression, but it did so while leaving them with little to no advocacy for future assignments.

A notable caveat to the negative perceptions described above is that participants rarely portrayed the FAIP assignment as wholly unrewarding. Even among those who strongly disliked the assignment, there was agreement that the most meaningful aspect of the role was the opportunity to shape and develop young aviators. Interviewees frequently described satisfaction in teaching students, watching them improve over time, and contributing directly to the production of UPT graduates. As one participant stated:

> The most rewarding part is taking a student on day 1 that knows nothing and then at the end of the syllabus you are flying with them 4 feet off your wing. Seeing what I set out to do and what I spent countless extra hours doing actually worked and knowing that their UPT experience was X amounts better than mine was the most rewarding part.

In addition to the intrinsic value of instruction, several participants emphasized that the assignment accelerated their own professional growth. Many described gaining a high level of airmanship, instructional competence, and responsibility much earlier than they believed they would have in an operational squadron. One interviewee noted:

> I will get to go to my B-course with a lot more airmanship, a better understanding of basic flying, and it will open a lot of bandwidth for me to work on the mission rather than skills as a pilot.

Still these positive aspects were usually described as offsets rather than overrides. Participants often spoke highly of the growth, responsibility, and fulfillment associated with instruction, but most did not view those benefits as sufficient to outweigh the broader burdens of the assignment. This tension recurred throughout the interviews. Participants often characterized the assignment as professionally meaningful and personally developmental, but not necessarily desirable as a long-term assignment - even before the prospect of a career AETC track was introduced. One respondent captured their ambivalence well:

> Being an instructor pilot is the most important job in the Air Force, although sometimes it does not feel like that because of our work hours and everything else.

These findings suggest that the negative stigma attached to FAIP assignments stems less from the position itself than from the structural conditions associated with the position. Participants valued the mission, the responsibility, and the opportunity to shape young aviators, but they consistently viewed the current FAIP construct as burdensome, career-limiting, and lacking in personal agency. This distinction is critical to understanding participant reactions to a potential career AETC pathway: interviewees did not uniformly reject the idea of a longer-term instructor track. Instead, they evaluated it through comparison with the current FAIP experience. Support for such a model was conditional on whether participants believed it would resolve, rather than extend, the frustrations associated with the existing FAIP assignment.

Key Theme: Support for a career AETC track depends on clear progression and recognition.

Initial reactions to the idea of a career AETC track were mixed. Some participants immediately endorsed the concept with one stating, "I strongly believe there should be a career progression through the instructor and AETC environment." Others reacted more skeptically, at first framing the concept as little more than a permanent FAIP track and, therefore, a "bad option." This range of responses is important because it reflects the extent to which participants associated the concept with their existing FAIP construct. As the interviews progressed and the distinction between a true career AETC model and the current FAIP assignment became clearer, most participants became more receptive to the idea. In this sense, support was not absent, but conditional on whether the pathway was a meaningful alternative rather than a prolonged version of an already unpopular assignment.

Participants consistently emphasized that such a pathway would need to offer recognizable forms of progression within AETC if it were to be taken seriously as a career model. Interest in assignments such as PIT was revealing in this regard. PIT was attractive not only because of its location – San Antonio – but because it represented a form of internal movement and professional development that does not currently feel accessible to many FAIPs. Several interviewees described the benefit of having experienced UPT instructors' transition to PIT, where their familiarity with student errors and instructional demands could be relevant to new instructor pilots. As one participant explained, an instructor with "three years of experience seeing the common mistakes of students would be a wealth of knowledge." Another proposed a more explicit pipeline of "five years as a FAIP at UPT and finishing out the rest of your

commitment as a PIT instructor," illustrating participants could imagine a longer-term AETC role if it contained internal progression rather than stagnation in the same assignment.

A second major condition of support was the presence of meaningful choice, particularly with respect to movement across trainer aircraft and locations. Participants repeatedly stressed that the attractiveness of a long-term AETC pathway would depend on whether it allowed mobility within the training enterprise rather than locking individuals into a single location of role for an extended period. One interviewee observed:

> Human nature, we love having decisions. If you could structure it where at the halfway point, they still stay in AETC, but they get the option to change bases or trainer aircraft, I think people will always love having more control.

Another captured the broader sentiment succinctly, "the more choice you give people the more willing they will be to take any option." participant comments suggest that interviewees were not simply looking for a longer commitment to the same work. They envisioned a pathway that preserved agency through meaningful opportunities for movement and variation over time, similar to the traditional AF career model. Importantly, this did not always mean constant relocation. As one participant put it, the appeal was having the option to "stay or move over the ten years," depending on personal and professional circumstances.

This emphasis on choice was most evident in discussions of locations, where participants stated remaining in one place for an extended period would make the pathway unattractive. As one participant noted:

> Staying in one place, especially one of the UPT locations for that long, and not having a lot of career progression opportunities would be a hard sell.

Another more bluntly stated, "I would not want to do a ten-year AETC career unless I knew I could at least move around within the AETC bases." The perspectives reinforce the earlier finding that location is central to how white-jet assignments are evaluated. For a career AETC track, however, location was not simply a source of dissatisfaction; it was one of the primary conditions shaping whether the pathway would be viable at all.

Finally, participants consistently distinguished between a voluntary career option and a forced extension of the current model. Several noted that they knew individuals who would be interested in remaining within AETC for longer periods, particularly if the role offered greater control and fit into their family planning. Yet, even those who supported the concept emphasized that it should remain elective and outside of the decision to FAIP. As one interviewee summarized:

> If someone wants to do it for 10 years, then let them. The problem with this idea really only comes when you start forcing people to do it.

Another similarly argued:

> It should not be that every single FAIP is doomed to AETC for the rest of their life, but for the onesie twosie people who want to do that? You are gaining an experienced instructor and happy member of the service.

Participants' accounts indicate that support for a career AETC track depended less on the concept of long-term instruction itself than on how that role was structured. Interviewees were far more receptive once they understood the pathway as a legitimate and internally progressive career model. This finding suggests that the DAF may need to be deliberate not only in how such a pathway is designed, but how it is communicated, given the negative stigma attached to the existing FAIP assignment.

Key Theme: Operational credibility requires force mix and instructor development.

Participants frequently identified the potential loss of operational credibility as one of the primary risks of a career AETC track. In their view, a larger population of long-term instructors could create an overly self-contained training environment, particularly if those instructors had limited experience outside of AETC. This concern was often framed as a tradeoff between production and perspective. As one interviewee put it, "FAIPs produce the quantity the AF says it needs but it is at the expense of the quality because of their lack of experience." Most participants did not treat this concern as disqualifying. Instead, they argued that the risk could be managed through deliberate policy design.

Several recommended targeted enrichment opportunities such as TDYs to operational units, shadowing other communities, and more deliberate instructor development programs. As one participant explained:

> Greater opportunity for instructor enrichment programs would have to be offered or you are just going to have stagnation in growth.

Another similarly argued that "you would have to incorporate TDYs to shadow other communities so that your perma-IPs could get a taste of what ops is like." Participants also pointed out that some mechanisms for development already exist within the training enterprise, though they are treated as secondary to the training mission and often reserved for MDS IP development. One interviewee noted that there are opportunities for specialized qualifications in

the T-6, including advanced formation and performing functional check flight duties[37], but that "they are not a part of the primary mission," and therefore not easily attainable in the current structure. For these participants, expanding such opportunities would help reduce stagnation and make a larger career-instructor cadre more professionally credible and sustainable.

Several participants challenged the assumption that the best UPT instructor is necessarily the most experienced operational pilot. Instead, some argued that pilot training requires instructors who are very familiar with the syllabus and expert in the craft of instruction. One MDS IP stated that as the UPT syllabus continues to go through changes, what AETC needs are "people who are knowledgeable experts on how to execute a syllabus, not necessarily the most experienced and skilled ops pilot." Others pointed to the current production outcomes as evidence that FAIPs already play a critical role in meeting training requirements. As one participant observed, "Laughlin is sitting at around 70% FAIPs and it is working well."[38]

Participant views on this issue also varied by training platform, particularly between the T-6 and T-38 programs. Several described the T-6 phase as primarily focused on building basic military flying skills and airmanship, which they believed could be taught effectively by pilots with strong instructional ability even if they lacked extensive operational experience. By contrast, concerns about operational perspective were far more pronounced on the T-38 side, where interviewees saw a clearer connection between instruction and preparation for fighter-oriented follow-on training. As one respondent noted:

> MDS IPs bring perspective to why we are doing what we are doing. T-38 block is supposed to set you up for IFF but FAIPs have never been to IFF so it's hard for them to bring the experience back.

However, participants generally believed this disparity could be mitigated if career AETC instructors on the T-38 side were given additional exposure to fighter training, such as completion of IFF, comparable to how FAIPs currently attend PIT before instructing. Anecdotally, several interviewees noted that this challenge is not entirely hypothetical, as UPT bases already experience limited fighter representation within the instructor force. One participant summarized both the cause and the consequence of this issue:

> The pipeline of fighter pilots back to UPT has kind of been shut down so now a lot of the T-38 IPS are ISR and AFSOC. FAIPs are inexperienced, but so are the MDS guys as they don't have fighter backgrounds, so we are just overall

[37] The FCF is a program where IPs fly T-6s that have been pulled from the flight line for maintenance and are being evaluated to be put back into the flying rotation.

[38] In this context, "working well" refers to the fact that in recent years, this base has been the only UPT location to consistently meet production targets.

> inexperienced. There is a gap between what the students learn it takes to fly fighters and what the reality is because of this lack of experience.

These responses suggest that the underlying challenge already exists within UPT, meaning a career AETC model would not create the problem so much as allow the Department to address it more deliberately through targeted development and operational exposure programs. Accordingly, participants treated concerns about operational credibility not as a fatal weakness of the concept, but as a manageable issue contingent on how the pathway was structured.

Key Theme: Voluntary uptake hinges on targeted and flexible incentives.

Unlike most pilot career paths during the initial ADSC, participants generally did not believe that a voluntary career AETC track could rely on the normal assignment process alone. Across interviews, there was a consistent sense that if the DAF wanted people to opt into the pathway rather than simply be assigned to it, the track would need to be intentionally incentivized. At the same time, participants were not necessarily asking for incentive packages on the scale of aviation retention bonuses. Instead, they described a range of smaller, more targeted financial and non-financial incentives that could make the pathway more attractive. The relative appeal of these incentives, however, varied considerably across respondents. Table 6.1 presents a sample of participant rankings, illustrating the extent to which the relative priority of proposed incentives varied across interviewees.

Table 6.1: Sample of Participant Rankings of Proposed Incentives

Participant	P1	P2	P3
1st Priority	Monetary Compensation	Shorter ADSC	Aircraft Preference
2nd Priority	Non-Deployable Status	Monetary Compensation	Non-Deployable Status
3rd Priority	Shorter ADSC		Shorter ADSC
4th Priority	Location Preference	Location Preference	Monetary Compensation
5th Priority	Aircraft Preference	Non-Deployable Status	Location Preference

Although several recurring categories appeared in participants' rankings, including aircraft choice, location preference, monetary compensation, non-deployable status, and shorter ADSC, the relative importance of these incentives varied substantially from person to person. This lack of convergence suggests that participants were not seeking one universal package so much as

indicating any effort to improve uptake of a career AETC track would likely require an intentional and flexible incentive structure.

For many participants, one of the most attractive incentives remained improved control over future assignment outcomes, particularly the possibility of receiving a preferred follow-on aircraft. In practice, this revealed that many interviewees were still evaluating the pathway through the lens of the traditional operational pilot career model, treating service in AETC as a means of eventually reaching a desired MDS rather than as a final destination. While this logic helps explain why aircraft choice remained such a powerful incentive, it also highlights a challenge for the DAF in designing a viable career AETC track. If the pathway is intended to stand on its own rather than function as a holding pattern before operational assignment, then it would need to be structured in ways that make the AETC career field itself feel more professionally desirable and rewarding.

Participants also discussed monetary compensation, though usually not in the form of a large one-time bonus. Instead, many were more interested in smaller or non-traditional forms of compensation tied directly to the realities of the assignment. The consensus was that "where [they] are at life wise, monetary incentives would be number one," and the follow-on discussion centered on small monthly payments rather than sweeping compensation. These compensation structures more clearly recognized the workload and risk associated with the instructor job and were less generalizable to the position as an aviator. Several reference the remote and isolated nature of the UPT bases and suggested that those conditions should be compensated accordingly. Others argued that instructor pilots should receive a form of instructor pay that acknowledged both the amount of work involved and the high stakes of the job. As one participant put it:

> They always say your wings are on the line, even if it is a student's fault so it would be nice to be compensated for that.

Another suggested "tax incentives similar to deployed benefits by changing the designator for IP," making clear that, for some, the issue was less about total pay and more about whether the AF formally recognized the unique demands of the assignment.

Lowering the ADSC also emerged as a meaningful incentive for many participants. Several reasoned that if a career AETC track capped a pilot's development in the training aircraft environment, the Department's investment in that pilot would be lower than it would be for someone sent through a full operational pipeline. From that perspective, a shorter commitment was seen not merely as a personal benefit, but as a policy design feature that more accurately reflected the level of institutional investment involved. Participants who supported this option viewed it as a relatively modest but meaningful way to make the pathway more competitive.

These findings suggest that participants did not expect a career AETC track to succeed without some form of intentional incentive structure. Just as importantly, however, they did not generally frame the solution in terms of massive bonuses or extensive compensation reforms.

Rather, they pointed to smaller but more deliberate incentives that could make the pathway feel more worthwhile. The central perception was not the DAF would need to outbid other career options, but it may need to visibly differentiate this pathway from the standard first-ten-years model if it expected people to volunteer for it.

Chapter 7. Synthesis: Integrating Model Insights and Pilot Perspectives

Model Results & Interview Findings

As Chapter 4 demonstrates, the quantitative effects produced by the model were modest overall. The clearest modeled improvement appeared in the experience ratio within operational squadrons, which under the guiding conceptual framework of this dissertation, should contribute positively to fighter pilot absorption. In principle, that relationship is well grounded. In practice, however, it depends on an important underlying assumption: the shortage of IPs in operational squadrons is driven primarily by the debt fighter communities owe to FTU and UPT manning requirements (Contreras, 2025). The interview findings suggest that this assumption is only a piece of the bigger puzzle.

Unobserved Retention Dynamics

While the requirement for operational units to send experienced pilots to training units exacerbates operational deficits, CAF participants also described the self-reinforcing cycle of burnout, separation, and reduced upgrade capacity as an equally major driver of the experienced aviator shortfall.[39] This points to an important limitation in interpreting the model's results. The model was not designed to capture the downstream organizational effects that participants associated with increased retention of experienced aviators. Specifically, it cannot directly represent how additional experienced aviators might reduce the workload concentration and alleviate the burnout dynamics, either partially or fully, that interviewees identified as central to ongoing retention problems.

Because the model relies on historical assignment and separation patterns, its policy effects are structurally bound by the very inventory losses and personnel flow behaviors that interviewees described as part of the current problem. Absent an endogenous retention mechanism, the model cannot simulate the possibility that better workload distribution and improved squadron health might themselves reduce attrition over time, thereby improving local training capacity.

Therefore, the positive trends that did emerge in the modeled experience ratios should not be dismissed as trivial. If the interviewees' description of workload and burnout dynamic is accurate, then the modeled results likely understate the policy's true value. Even if those second order effects do not emerge to the extent participants anticipated, the interview findings still suggest that modest uptake should not be treated as evidence of ineffectiveness.

[39] This is the "death spiral" described earlier in this study.

Participants consistently viewed targeted personnel programs as worthwhile when they retained even a small number of aviators who might otherwise have left the force. Respondents rejected the idea that a personnel policy must generate broad participation to be considered successful. Instead, they described such initiatives as valuable precisely because they provide a viable option to specific individuals at particular points in their careers. Even when these programs attract only a limited number of volunteers, each retained aviator could help reduce workload pressure on those who remain while preserving experience that would otherwise be lost. Thus, the policy logic advanced by participants was not one of mass transformation, but of marginal retention in a force where each experienced pilot matters.

In conclusion, if the interviews are correct that the model omits important second-order effects, then the quantitative findings likely understate each policy's benefit. But even if the model's more limited estimates prove to be the most accurate forecast, it should not negate the value of the stability, control, and flexibility such a pathway could provide to a subset of aviators. The broader implication is the Air Force may need to reconsider how it defines an "effective" personnel policy. In an experienced-constrained force, a policy may be effective not because it attracts mass participation and significant results, but because it selectively retains individual cases whose continued service reduces pressure across the wider enterprise.[40]

Cross-Interview Population Synthesis

A second important contribution of this synthesis comes from comparing findings across the two interview populations. Although the FAIP and CAF participants were asked about different work environments and different versions of a career-track concept, their responses converged around two major barriers to policy uptake: assignment location and perceived legitimacy of the career pathway itself.[41]

Assignment Location

First, both populations identified assignment location as one of the strongest determinants of whether a specialized career track would be attractive. Across interviews, UPT locations, and some FTU locations, were consistently described as a major obstacle to voluntary uptake. Although the DAF cannot easily change the geographic distribution of its training bases, recognizing that negative perceptions of these assignments are rooted heavily in location rather than mission alone has important policy implications. Participants in both groups made clear that location preferences are deeply personal. While some bases carried broadly negative reputations, no location was uniformly undesirable to all respondents. This suggests the key implementation

[40] It is worth nothing that implementing and overseeing additional career tracks introduces administrative burdens and complexities for promotion management, which should be considered alongside any potential benefits.

[41] Legitimacy refers to whether participants viewed the proposed track as a professionally recognized and sustainable career option, rather than as a stigmatized detour from the traditional operational pathway.

variable is not whether a base is popular in aggregate, but whether the Air Force can provide enough assignment choice to match volunteers to locations they are willing to accept.

For locations that are persistently difficult to staff, the Air Force may already possess indicators of where stronger incentives are required, including repeated staffing shortfalls and separation patterns. There is also a precedent outside of the active-duty assignment system for differentiating incentives by location. Contracted simulator companies and other civilian aviation employers frequently use location-based pay adjustments to attract instructors to less desirable sites. While the DAF cannot factor in the assignment preferences of all service members in policy design, these examples suggest a practical blueprint for identifying where policy uptake is likely to be weakest and where targeted incentives may be most necessary.[42]

Establishing Credible Career Paths

Second, both interview populations expressed concern about how specialized flying tracks would coexist with the traditional Air Force career model. Mid-career aviators consistently viewed the existing system, as organized around upward mobility through command-orientated progression. Many worried that an AETC-focused pathway would be interpreted as stepping off that track without the institutional protection necessary to make it a legitimate long-term option. For younger aviators, support for a career AETC pathway depended on whether it was structured as a true career field with internal progression rather than as an extended holding pattern outside of the mainstream personnel system. Ultimately, participants did not want these tracks to function as informal side paths. They valued recognized, protected, and developed career options with continued progression if they so choose.

This suggests that successful implementation may require more than creating a new assignment category. The DAF may need to establish separate promotion processes, developmental opportunities, and professional expectations specific to the AETC centered career track to ensure that these pathways offer visible growth, mobility, and institutional recognition. Without those features, participants indicated that such career tracks would risk being seen less a viable professional alternative and more as a career-ending option.

Know your Target Population

At the same time, the two populations diverged enough in their preferences that incentive and policy design should remain sensitive to the target audience. Although choice and flexibility were common priorities among the groups, young-career aviators and mid-career aviators tended to evaluate these features differently. Early career participants were especially concerned that a career track provides internal progression, movement opportunities, and recognizable professional development akin to the traditional Air Force model. They were also more receptive

[42] Recent efforts to transition a few of the FTUs from AETC to ACC control – and subsequently co-locate them with operational bases – may also improve FTU staffing and minimize the perceived location barrier (Cox, 2026a).

to relatively modest, targeted incentives, such as monthly instructor pay and location-based compensation. Mid-career participants, by contrast, placed greater weight on geographic stability, family considerations, and improved assignment control. They were generally more skeptical that financial incentives alone could drive voluntary uptake, particularly given the extent to which airline and Reserve-component alternatives dominate the economic calculus at that stage in a pilot's carer.

Conclusion

These findings reinforce the broader conclusion that a one-size-fits all retention strategy is poorly suited to the problem facing aviation communities. The interview data suggests that specialized personnel policies are most likely to succeed when they offer credible commitments, meaningful flexibility, and options tailored to different career stages. Their value lies not in universal appeal, but in their ability to retain targeted categories of experience that might be lost otherwise. Consequently, the proposed career tracks should be best understood as one potentially useful instrument within a broader portfolio of retention tools, not as a comprehensive solution to pilot manning challenges.

Considering Model Limitations and Future Uses

This model was designed with a specific purpose in mind: to understand how changes to personnel composition affect absorption capabilities. Even with baseline validation, however, the model remains subject to important limitations stemming from its structural assumptions and logic choices.

Sensitivity to Upgrade Cycles and Phases

In practice, squadrons attempt to keep pilots on two-ship and four-ship upgrade timelines together as a cohort, but the entire upgrade enterprise is not normally halted because of a single student. Although the model decouples some upgrade processes to reduce artificial stoppage, in practice, one student's delay can still affect the progression of the larger cohort. Because the definition of "experienced" adopted in this research is tied to completion of FLUG, outcomes related to time-to-flight-lead should be interpreted with caution. Baseline validation helps reduce some of this concern, but the model's inability to represent each pilot's individual upgrade path remains a meaningful limitation.

Sensitivity to Shifting Retention Dynamics

As discussed in the previous section, one of the most important limitations identified through interviews is the model's inability to capture shifting retention dynamics. If the second-order effects described by participants are in fact central to improving retention, the model likely understates the value of policies aimed at retaining experienced pilots. However, the downstream

effects within operational squadrons – particularly those related to workload distribution, burnout reduction, and improved organizational health – cannot be easily represented in the current framework and are difficult to model in general. If such policies are implemented, future research could use differences in retention and PCS patterns before and after implementation as proxy indicators for these shifting dynamics.

Sensitivity to Aviation-Community Level Dynamics

Although the model was designed to adapt to other MDSs, provided the user has access to comparable data, the career pathways analyzed here could be applicable across the broader aviation community rather than within a single MDS. FTU requirements are sourced from within a given community, but UPT requirements are filled at the aviation enterprise level. As a result, changes in retention or assignment dynamics in other communities could affect the F-16 community in ways this model does not capture. Policy effects would therefore be distributed across MDSs and may differ from the F-16 case presented here. The interview findings and broader thematic conclusions are somewhat more immune to this limitation, however, because the participant pool consisted of more combat aviators than F-16 pilots alone.

Model Scope and Intended Use

This model is intended as an exploratory tool rather than an optimization framework. Although its sortie-allocation logic seeks to minimize RAP noncompliance, that function serves as a dynamic guardrail rather than as an optimization mechanism. The model relies on SME-validated user inputs and emphasizes transparent outputs that highlight irregularities and deviations from the validated baseline. As such, it can be used to examine how changes in personnel dynamics, flying-hour budgets, and other inputs affect absorption outcomes relative to that baseline. It cannot, however, determine the optimal personnel movement patterns or sortie-hour allocations necessary to produce the most effective absorption capability.

Chapter 8. Recommendations for Optimizing Retention of Combat Pilots

The catalyst for this dissertation was a desire to understand how prospective personnel policies affect operational outcomes and how such policies can be designed with the considered target population in mind. More specifically, the intersection of retention policy and absorption capability presents a particularly important opportunity for the DAF. The current stage of development for these aviation career pathways is especially significant, as it creates an opportunity for the DAF to shape the policy in ways that maximize its effectiveness, particularly with respect to uptake rates.

Although this research is not intended to serve as a force-structure planning tool or a mechanism for optimizing personnel movement across the enterprise, it does provide a framework for assessing the effectiveness personnel policy. Beyond the institutional benefits associated with cost savings and the preservation of aviation experience, policymakers must also understand how service members are likely to respond to different career options and what barriers may limit implementation. Even a well-designed policy may fail to achieve its intended effect if those obstacles are never uncovered and therefore ignored.

To synthesize the findings and provide recommendations developed across the preceding chapters, this section returns to the original research question and hypotheses that inspired the study. Table 8.1 presents the questions considered alongside indications of how the analysis addressed each. These considerations all aimed to answer the main research question: How can the Air Force effectively design and implement alternative aviator career paths to improve both personnel and operational outcomes? To address this question, Table 8.1 revisits the guiding questions and indicates how each was addressed through the study's mixed-methods research design:

Table 8.1: Mapping of Guiding Questions to Methods

Research Questions	Research Methods
What are the impacts of offering alternative instructor career paths have on operational unit experience levels and absorption related outcomes?	- Python based simulation modeling and interpretation with interview findings
What factors influence aviators' willingness to participate in alternative career paths?	- Semi-structured interviews with two cohorts of aviators
How do these factors differ between early-career and mid-career officers?	- Comparison of themes across the two interview cohorts

Research Questions	Research Methods
What are the most likely barriers to implementation and uptake rates?	- Semi-structured interviews with two cohorts of aviators.

With the relationship between the research questions and the study design reestablished, the discussion now turns to the hypotheses that guided the analysis and the extent to which the findings support or refute them, presented in Table 8.2.

Table 8.2: Hypothesis Assessments and Supporting Evidence

Hypothesis	Assessment	Evidence
If implemented using only the current fighter inventory, the proposed end-of-ADSC instructor track may produce limited near-term improvements in operational experience levels.	**Supported**	Simulation results indicate modest near-term improvements and interviews indicated that sourcing instructors from operational squadrons could perpetuate manning issue this policy seeks to resolve
If a career-AETC track is established using a dedicated UPT-sourced instructor cohort, operational units could see larger improvements in experience levels.	**Refuted**	Policy Excursion 2 yields the lowest gains in EXP/INX levels across all three policy excursions
Different grade-cohorts may respond to different incentives; one-size fits all policy design may underperform.	**Supported**	Early career officers responded more favorably to modest monetary incentives and clear career progression. Mid-career officers emphasized stability and predictability
Geographic location may emerge as a common frustration among the two cohorts.	**Supported**	Interviewees in both cohorts identified geographic location as a recurring source of dissatisfaction. Assignment location, therefore, may be a broadly salient source of discontent regardless of career stage
Personnel policies designed with user-informed, personnel-centered features may have better uptake and fewer implementation barriers.	**Supported**	Barriers to participation highlighted in interviews, such as desire for options and career guardrails, could be addressed during policy design to mitigate uptake degradation

With the study's original purpose reestablished, the following section summarizes the key findings, offers recommendations, and identifies opportunities for future research.

Key Findings

Modeling efforts likely understate the value of policies that retain experienced aviators.

Because the model does not capture important second-order effects – especially the relationship between workload distribution, burnout, and future retention – modeling efforts will likely understate the broader organizational value of retaining even a small number of additional experienced pilots.

Location, inherent distrust in the enterprise, and embedded career norms are the largest barriers to policy implementation and uptake.

Across both interview populations, assignment location, skepticism toward the Air Force's long term policy consistency, and concern over how specialized tracks fit within traditional career progression emerged as the most significant barriers to voluntary population.

Production increase alone cannot resolve operational challenges.

While expanding pilot production remains important, participants observed that without corresponding improvements in retention, increased production intensifies absorption burdens and compounds existing problems in operational units.

Control, flexibility, and stability matter more than monetary incentives alone.

Although compensation remains relevant, participants consistently described assignment control, family stability and predictability, and increased choices as more important drivers of retention than monetary incentives by themselves.

Different age cohorts respond to different incentives.

Early-career and mid-career aviators do not evaluate policy options in the same way. As a result, one-size-fits-all strategies are unlikely to perform as effectively as policies tailored to the preferences of specific career stages.

Alternative aviation career paths must be seen as legitimate career tracks rather than dead ends.

Specialized tracks are unlikely to gain meaningful uptake unless they are supported by credible promotion pathways, professional development opportunities, and clear institutional recognition.

Successful personnel policy requires direct engagement with the people it is intended to affect.

Policies are more likely to succeed when policymakers incorporate the perspectives of the target population during policy design, refinement, and implementation.

Policy Recommendations

The following recommendations thus stem from the above research and key findings.

Prioritize quality of life and assignment control features in future aviation retention policies.

Future aviation retention initiatives should place greater emphasis on the quality-of-life factors that participants in this study consistently identified as central to their decision-making. In particular, policies that improve assignment stability, offer multiple options, provide greater predictability, and preserve opportunities to continue flying are likely to be more effective than those that rely primarily on monetary incentives.

The findings of this study suggest that monetary incentives are rarely sufficient on their own to offset dissatisfaction with other aspects of a flying career in the Air Force. Additionally, participants emphasized the Air Force will not be able to out-pay the airlines, so the issues of instability, control, and job satisfaction are focus areas. Accordingly, the DAF should address retention tools that treat quality of life and assignment control as core features rather than secondary considerations. Efforts such as CAIP, CIP and the Demo Bonus Program are steps in the right direction and alternative career pathways will be a welcome addition to this broader retention strategy.

Make location preference a central design feature of any specialized track.

Because assignment location emerged across both interview populations as one of the most important detriments to policy attractiveness, location should be treated as a central design variable in any future specialized career pathway. The issue is not simply that some locations are broadly unpopular, but that location preference is highly individualized and closely tied to family needs, spouse employment, schools, and long-term personal planning.

For this reason, a policy's effectiveness is likely to depend less on whether a location is universally desirable than on whether members feel they have meaningful influence over where they serve. Where full choice is not feasible, the DAF should at minimum consider stronger incentives or greater assignment transparency for historically difficult-to-fill locations.

Know your target population and tailor incentives by career stage.

A central implication of this study is that personnel policy is unlikely to be equally effective across all groups if it assumes service members respond uniformly to the same incentives. The

interview findings showed clear differences between early-career and mid-career aviators in how they evaluated alternative career paths and assignment structures. Early career officers were more likely to focus on future development, follow-on opportunities, and modest monetary incentives. Mid-career officers were more likely to emphasize stability and predictability. These differences suggest the success of a policy depends in large part on whether its design aligns with the preferences, pressures and decision calculus of the specific target population.

Personnel policy that depends on voluntary participation, behavioral response, or long-term commitment should begin with a clear understanding of the population it targets. This includes identifying where individuals are in their careers, what institutional and personal constraints shape their choices, and which policy features are likely to be perceived as important by that group. In summary, the DAF should elicit feedback from its intended populations. A policy that appears attractive in abstract may fail in implementation if not aligned with the population's actual incentives or professional concerns. Accordingly, the Air Force should approach future personnel initiatives with greater attention to population-specific design. Effectiveness often depends less on the existence of a policy option than on its applicability to the people it is meant to serve.

Build credibility through contractual clarity, legitimate career pathway support structures, and policy consistency.

One of the clearest findings from the interviews was even attractive policies will struggle to gain traction if the target population does not trust the institution to preserve the promised benefits over time. Interviewees repeatedly described skepticism rooted in prior experiences with inconsistent policy implementation, shifting promotion signals, and assignment uncertainty. If the DAF intends to expand the use of these targeted programs, it needs to do so in a way that minimizes ambiguity, clearly defines the terms of participation, and avoids post hoc changes that undermine confidence in the program. Just as importantly, these pathways must be supported by visible promotion, development, and professional-recognition structures prior to implementation, so they are seen as long-term career options thoughtfully implemented within the current system.

Design policies that target the root source of the problem.

The evidence in this study suggests the central challenge in fighter manning is not simply a shortage of total plots, but a shortage of experienced aviators in the cohorts most critical to sustaining absorption. Although production reform is integral, increasing the number of new pilots entering the pipeline will not resolve the problem if the Air Force continues to lose the instructor-grade and mid-career aviators needed to absorb and develop them. Future policy should focus more directly on preserving the experience base at operational squadrons as well as training bases, coupling reforms in retention with those in production to ensure the minimization of pipeline bottlenecks.

If the DAF intends to target end of career aviators most essential to absorption, it should consider whether alternative aviation career paths should be offered not only at training bases, but also at operational bases. Building a stable cadre of IPs within the training enterprise may help reduce sourcing demands, but preserving a cadre of IPs at operational squadrons may address the root of the problem more directly. Programs like CAIP coupled with career paths may yield greater benefits then the standalone policies.

Evaluate policy success using marginal retention and operational relief, not just the take rate

This study suggests that the success of a personnel policy should not be judged solely by whether it attracts large numbers of participants. In an experience-constrained force, retaining even a small number of additional experienced aviators may produce meaningful benefits by reducing strain on operational squadrons, preserving mentorship capacity, and stabilizing the internal training pipeline.

This is particularly important given low participation rates are often interpreted as evidence a program has failed, even when that conclusion may be premature or analytically incomplete. For example, the Air Force discontinued a previous fly-only program in 2018 after only two individuals elected to participate (Losey, 2020b). While such a take rate may appear to justify cancellation on its face, this study suggests that participation numbers alone may obscure the actual value of a targeted policy. Future policy evaluation should therefore place greater emphasis on the operational relevance of who is retained, not merely how many.

Conclusion

A central implication of this research is that successful personnel policy requires direct engagement with the affected individuals. Because these policies depend heavily on voluntary uptake, their success is shaped not only by institutional logic, but by how potential participants interpret the policy's risks, benefits, and credibility. Early and sustained engagement with affected populations can help policymakers identify barriers to participation, refine design features before implementation, and better align institutional goals with individual preferences. More broadly, doing so may also help rebuild confidence in a personnel system that many interviewees described as opaque and insufficiently responsive individual concerns. Ultimately, alternative career paths are most promising when designed as experience-retention tools, not simply additional assignment categories.

Areas for Future Research

Future research can build on this study in several meaningful ways:

- **Expand the model to multiple MDSs.**
  The present model is parameterized to a single fighter community and while that community can easily be switched with access to data, extending it to include multiple MDSs at once would provide more analysis and potentially a broader set of findings. Future work could better capture enterprise-level assignments, training, and absorption dynamics. Because UPT sourcing and broader personnel requirements operate across the aviation enterprise rather than one platform alone, a multi-MDS framework would provide a more complete picture.
- **Incorporate endogenous second-order retention effects.**
  The current model relies on historical assignment and attrition patterns and cannot capture the possibility that modest gains in experienced manning may themselves improve retention over time. Future versions of the model should seek to represent the relationship between workload distribution, burnout, squadron health, and subsequent separation behavior more directly.
- **Evaluate operational output under alternative resource conditions.**
  This model can be used to examine how operational output changes under different resource assumptions, such as higher sortie-generation capacity, different flying-hour allocations, or changes in FTU production levels. These excursions would help clarify how personnel policy effects interact with broader resource constraints across the force.

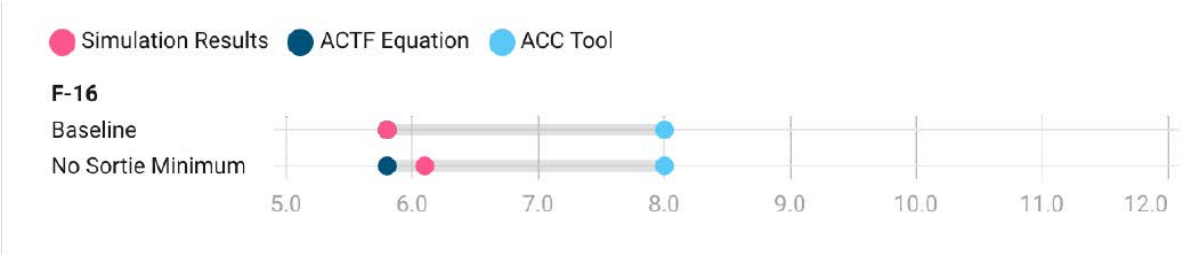
Appendix A: Model Baseline and Policy Excursion Validation

Before introducing policy excursions, it was necessary to establish that the simulation model produced a credible baseline representation of F-16 community personnel and absorption dynamics. Validation was conducted in two stages. First, I compared baseline time-to-flight-lead (TTFL) output from this dissertation's model to the validated squadron-level absorption model on which portions of this research are built. Second, I iterated the model logic with SMEs at ACC and validated the baseline against four operationally meaningful metrics discussed below.

Comparison to Prior Validated Model

The first validation was the 2023 squadron-level absorption model from which this dissertation expands upon (Nacho, 2023). That earlier model produced a validated baseline TTFL of approximately 26 months for a single squadron over repeated Monte Carlo runs. By comparison, the baseline configuration in the present model produced a TTFL of 26.5 months. Figure A.1 displays the comparison.

Figure A.1: Comparison of Baseline TTFL with Prior Validated Squadron Model



This result provides an important check on the validity of the upgrade and scheduling logic in the present model. Unlike the earlier model, which did not explicitly distinguish between different types of upgrade and continuation sorties, the present model introduces a monthly scheduling and daily execution that allocates specific sortie packages to explicit pilots under operational constraints. The close correspondence between the two TTFL outputs suggests that the added scheduling logic did not distort the underlying upgrade progression dynamics and that the expanded model remains consistent with the earlier validated standard.

SME Validation with ACC

The second stage of validation consisted of iterative review with ACC flight-operations SMEs. These discussions focused on whether the model's baseline output aligned with current

operational expectations. Four metrics were used as the primary validation targets: operational experience mix, TTFL, mean upgrade-cycle timelines, and mean separation counts/attrition rate.

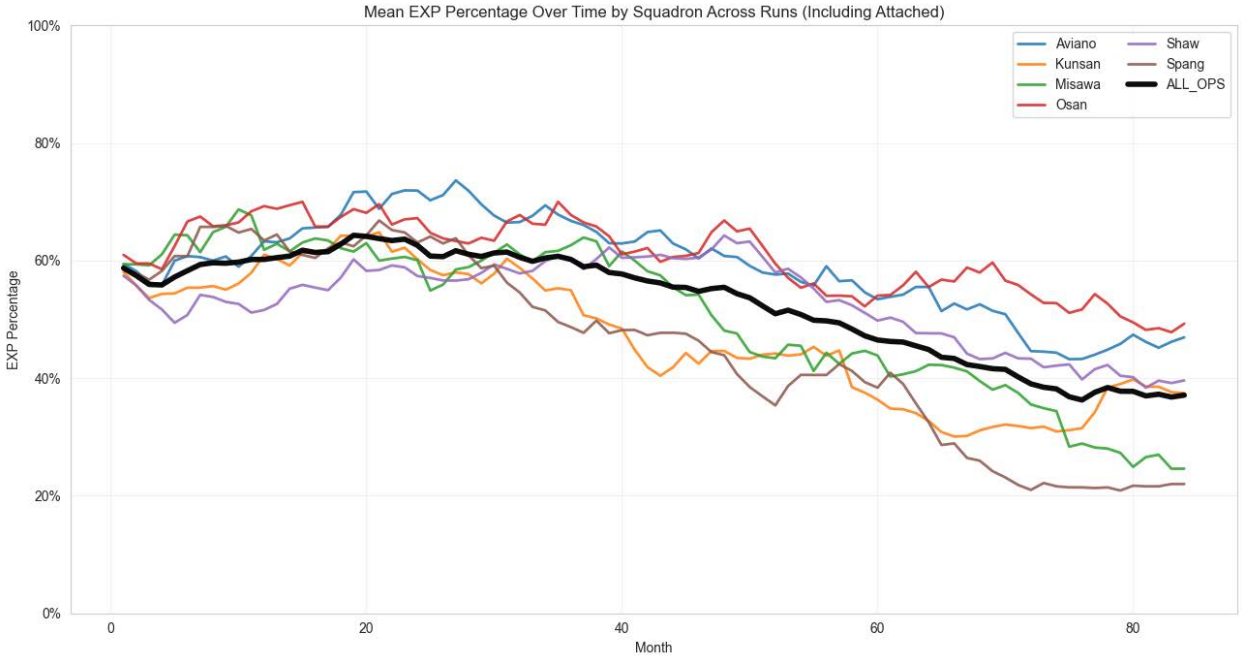
TTFL

Although TTFL has already been compared to the prior validated model, ACC SMEs also reviewed the output independently. According to these SMEs, a TTFL in the range of approximately 24 to 36 months is consistent with current operational conditions. The model's baseline TTFL of 26.5 months falls comfortably within this range and was assessed as credible.

Experience Mix

ACC SMEs also provided reference expectations regarding the trajectory of operational experience mix under current force-structure conditions. Specifically, they indicated that current projections suggest a continued decline in operational experience levels over the coming years, with the experienced share in operational squadrons falling below 40%. The baseline model reproduces the same general pattern highlighted in Figure A.2.

Figure A.2: Baseline Operational Experience Percentage over Time

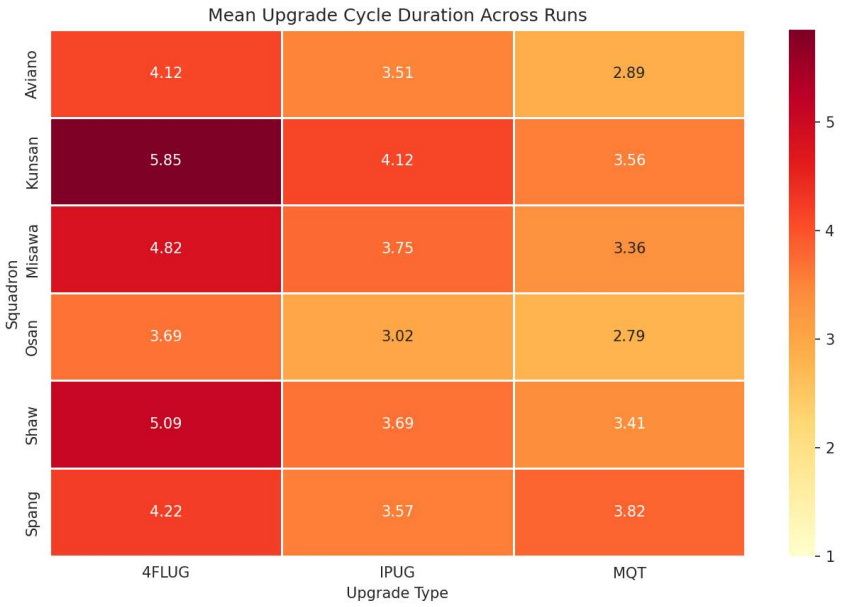


Upgrade-Cycle Timelines

Upgrade-cycle timelines were also reviewed with ACC SMEs. Figure A.3 presents the mean cycle lengths for the model's principal upgrades. SMEs assed the relative ordering of these timelines as realistic. In particular, they noted that FLUG should generally take longer than MQT

and IPUG because these latter two upgrades are often prioritized to preserve near-term squadron functionality and instructor production.

Figure A.3 Mean Upgrade-Cycle Timelines at Baseline



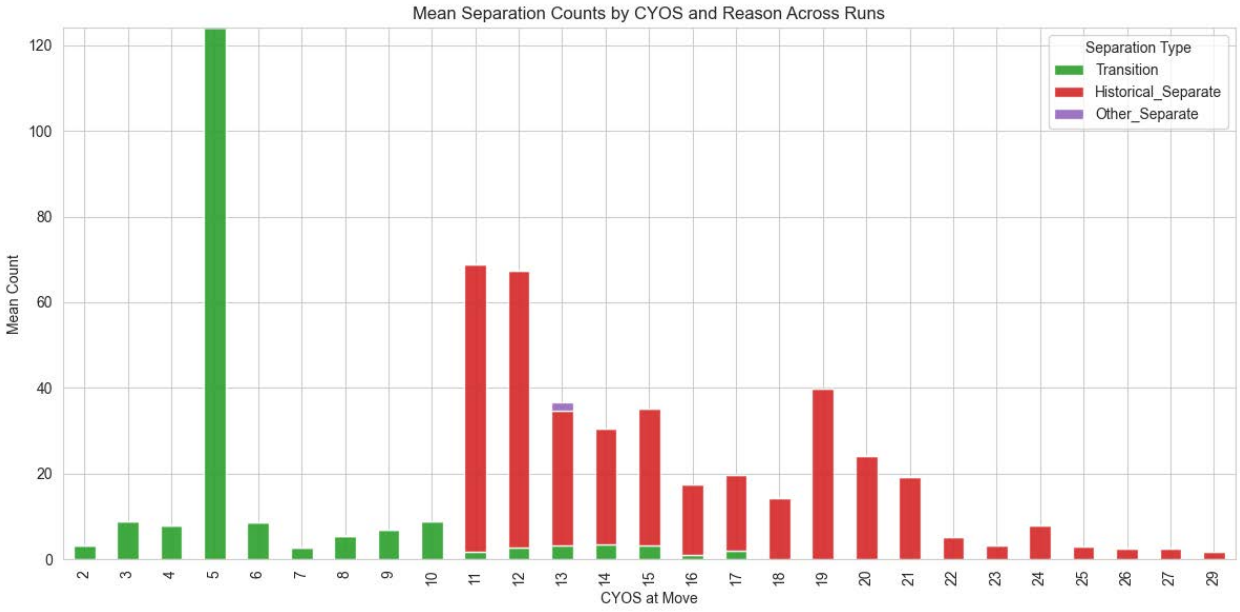
One caveat was noted with respect to MQT timing. In practice, MQT completion beyond three months requires a waiver, whereas the model occasionally produces timelines exceeding that threshold. This is attributable to the upgrade-coupling logic and while that is a limitation of the model logic, the broader pattern of upgrade timing remained operationally plausible.

Separation Counts and Attrition Rate

Finally, ACC SMEs assessed whether the model's personnel outflow behavior was realistic. They indicated that a baseline attrition rate in the range of 5-10% is consistent with current expectations. The baseline model produced a mean attrition rate of approximately ~6%, placing it within the acceptable range.

In addition to the overall attrition rate, SMEs reviewed the timing and pattern of separations and transitions generated by the historical assignment logic. Figure A.4 presents the mean separation counts by CYOS. They confirmed that the model reproduced the expected concentration of losses around the 11-13 and 19-21 CYOS windows – representing the end-of-ADSC and retirement ages. They also assessed the modeled timing of transitions to fifth-generation aircraft as broadly realistic.

Figure A.4: Mean Separation Counts by CYOS at Baseline



Conclusion

These two validation stages provide confidence that the model's baseline behavior is a credible representation of current F-16 community dynamics. The close correspondence with the earlier validated squadron-level model supports the consistency of the upgrade and scheduling logic, while SME review at ACC confirms the model produces realistic experience and personnel flow trends. Although no simulation can fully capture the complexity of the real-world system, these checks establish that the baseline is sufficiently valid for use in the policy excursions analyzed in this dissertation.

Appendix B: Semi-Structured Interview Protocol

This appendix presents the interview protocol for both population subsets in the 33 semi-structured interviews I completed in January-March 2026. This section walks through sampling strategy, composition, and protocol before ending with a sample list of interview questions and Human Subject Protection Committee (HSPC) determination.

Sampling Strategy and Saturation

Thematic saturation was the final target of the interviews. Typically, thematic saturation refers to the point "at which gathering more data about a theoretical construct reveals no new properties, nor yields any further thematic insights about the emerging theory" (Hennink and Kaiser, 2022). This is the point in data collection when all important issues or insights are exhausted. For the purposes of this research, interviews were conducted over a three-month period, and recruitment continued until it was no longer feasible to sustain further snowball sampling within the research timeline. It is important to note that the geopolitical environment shifted abruptly during that window, with multiple CAF units embedded in the sampling chain preparing for deployments to the Middle East (Torbati et al., 2026). As operational tempo increased, several prospective interviewees withdrew participation to accommodate mission requirements and increased responsibilities.

Interview recruitment began through cold-email outreach supported by informal gatekeepers drawn from prior AF professional contacts. From those initial points of contact, snowball sampling was used to expand the participant pool. This approach enabled the research to gain a foothold in each target community and then build outward through referrals from interviewees and trusted intermediaries.

Sample Composition

The intended sample population can be categorized into two distinct groups: first-assignment instructor pilots (FAIPs) and operational IPs. Within the latter group, the research sought to include several subpopulations, specifically operational IPs currently serving "white jet" tours UPT, FTU IPs, and a mix of fourth generation and fifth generation CAF IPs. This structure was chosen to capture perspectives from both the training pipeline and the operational force, as well as from individuals at different points in the instructor-development and retention cycle.

The final sample consisted of 33 interviewees, divided between CAF IPs and FAIPs. The CAF sample included 19 instructor pilots, three of whom were currently serving white-jet tours and three of whom were previously FAIPs. The FAIP sample included 14 interviewees, evenly split between the T-6 and T-38 communities. CAF participants came from the F-16, F-15E, and

F-35 communities. The FAIPs were also distributed across different phases of three-year instructor tours, with some still in pilot instructor training (PIT) and others already transitioned into follow on MDS training. Among the CAF IPs, ranks ranged from senior Captain to Colonel, though most of the sample consisted of senior Captains and early Majors nearing the end of their initial ADSC.

Delimitations

Two delimitations of the interview sample are important to note: (1) FAIPs at Sheppard AFB were not interviewed and (2) the sample remained within the fighter community. The first boundary was established because the ENJJPT syllabus, training progression, and operational tempo differ significantly from those at other UPT bases. As to the second boundary, although the broader issues examined here affect multiple aviation communities, the sample reflects the availability of access and professional connections. It also aligns well with the simulation model, which is based on fighter standards and fighter-community dynamics. In that sense, the concentration of the interview sample within the fighter force supported synthesis between the quantitative and qualitative portions of the research.

Interview Protocol

All interviews were conducted individually with Microsoft Teams. Verbal consent was obtained for recording and transcribing, which were used to supplement handwritten notes. The interviews were semi-structured, with two separate protocols developed: one for FAIPs and one for CAF IPs. Although some questions developed for FAIPs were also used for white-jet IPs, the white-jet interviewees primarily contributed insights relevant to the operational-side sentiment analysis. Across both subject groups, the interview questions broadly focused on actual experiences, views toward current assignment structures, and perceptions of potential policy changes that could affect separation decisions at the end of pilot training of upon completion of the initial ADSC.

CAF Instructor Pilots Questions

The following list of questions are the broad level questions I asked every CAF IP interviewee. There were more sub-questions as well as evolving questions that came up that were different in each interview which is the strength of semi structured interviews.

- How would you describe the current situation regarding instructor pilot (IP) retention?
- In your view, what factors influence a pilot's decision to stay in or leave the IP role or active duty in general?
- What impact, if any, does the IP shortage have on operations or mission readiness?
- What is your initial reaction to either or both of these career tracks?

- If you could consider any type of incentive — not limited to that list — what would be the most impactful vs the least impactful?

FAIP Questions

The following list of questions are the broad level questions I asked all UPT instructors. Similar to the CAF IP protocol, there were other sub-questions that emerged across interviews.

- What led you to want to become a first-assignment instructor pilot?
- How has your experience as a FAIP influenced your motivation and outlook on your future AF career?
- When you think about your career moving forward, how do you see the IP role fitting in?
- What is your initial to hearing about the dedicated AETC career track?
- From your perspective, what would make the FAIP position more attractive – either for new FAIPs or for those considering coming back to teach?
- What are the potential benefits and drawbacks to this career track?

Internal Review Board Information

I received approval from both the RAND Human Subject Protection Committee (HSPC) and the DAF's Component Office of Human Research Protections (COHRP). Both the HSPC and COHRP reviewed all documents related to the semi-structured interview process before making their determination, including e-mail introduction, interview read-ahead, verbal consent form, interview protocol, and data safeguarding plan. This research fell under Category 2.ii – Educational Tests, Survey Procedures, Interview Procedures and Observation of Public Behavior (low risk). The RAND HSPC ID for this study is 2025-N0305-MOD-0.

Appendix C: Background on Recent Changes to Air Force Retirement and Aviator Retention Incentives

This appendix provides background on several major retention-related policy tools, and their recent changes, relevant to the personnel context examined in this dissertation. These include the military retirement system and the recent changes to the Aviation Bonus (AvB). Together, these policies illustrate the broader shift in the DAF retention strategy from one relying primarily on long-term financial incentives to one that increasingly incorporates flexibility, assignment stability, and mid-career retention tools.

Retirement Systems: Legacy vs. Blended Retirement Systems

The traditional military retirement system is a government-funded defined-benefit system that cliff vests at 20 years of service. Under this system service members who leave active duty before 20 years receive no non-disability retirement benefit. Those who remain until retirement eligibility received a pension calculated at 2.5% multiplied by years of service and the average of the member's highest 36 months of basic pay. This structure was designed to support the retention of a career military force by creating a strong incentive to remain in service through retirement eligibility (Kamarck, 2024).

In 2018, the DAF implemented the Blended Retirement System (BRS), which combines a reduced defined-benefit pension with a defined-contribution component through the Thrift Savings Plan (TSP), continuation pay, and a lump-sum retirement option. Under BRS, the pension multiplier was reduced from 2.5% to 2.0% per year of service (U.S. DoD, 2017). In exchange, the government contributes automatically to the member's TSP account and provides matching contributions after the first two years of service. Members become vested in these contributions after two years, allowing them to retain retirement-related benefits even if they separate well before the 20-year point.

Because BRS offers earlier access to some retirement-related benefits, initial analyses suggested that it could reduce long term retention by making earlier separation more financially viable (Seck, 2023). At the same time, it may improve retention in the middle years by incentivizing members to remain beyond their initial commitment, especially if paired with other new retention initiatives such as the alternative career paths studied above. In that sense, the BRS reflects a broader shit in retention policy away from relying solely on the traditional 20-year retirement model and toward preserving experience during the years when it may provide the greatest return to the DAF.

Aviation Bonus (AvB)

The AvB has long been one of the DAF's primary aviator-specific retention tools. Its basic purpose is to incentivize continued service among rated officers by offering additional compensation in exchange for an additional service commitment. As the current Chief of Staff of the Air Force has stated, the bonus is intended to help the service retain expertise and maintain the mix of experienced aviators required to meet operational demands.

Historically, the AvB was offered after a pilot's initial UPT active-duty service commitment expired. Until FY24, the legacy AvB structure generally allowed eligible rated officers to select from fixed-duration contracts of from contracts extending to specified carer milestones, such as the 20 years of service or the annual years of aviation service cap. Annual payout levels varied by contract length and by aviation community manning needs. In practice, this means that bonus amounts fluctuate over time and communities experience the greatest retention risk – often fighter and bomber communities – often receive the highest annual rates.

The AvB therefore serves as both a retention incentive and a policy signal. By adjusting annual rates and community eligibility, the DAF can indicate which aviation communities it views as most at risk in a given year.

The Demonstration program: DPMI and DPAP

Beginning in FY24, the DAF supplemented the legacy AvB with a Demonstration Program. This program differs from the legacy AvB in three important ways (Cox, 2026b). First, it is offered only to pilots rather than all rated officers. Second, it is available before expiration of the initial UPT service commitment, specifically to pilots with one or two years remaining on their initial ADSC. Third, it introduces a non-monetary retention incentive focused on assignment stability and preference.

The Demonstration Program includes two separate components: the Demonstration Program Monetary Incentive (DPMI) and the Demonstration Program Assignment of Preference (DPAP). DPMI functions like the tradition AvB by offering additional compensation in exchange for continued service. DPAP, by contrast, targets one of the most frequently cited non-monetary drivers of pilot separation – instability in location and family life – by offering eligible pilots a choice among a preferred assignment location list, exclusion from a specified location, or the ability to remain in place.

DPAP carries a service commitment tied to the assignment preference benefit. Because DPMI and DPAP are signed as separate contracts, the DAF retains the ability to cancel the DPAP commitment if it cannot honor the promised assignment preference (Cox, 2026). Similarly, selection for certain competitive developmental assignments may nullify the DPAP obligation. This separation of contractual authorities is important because it allows the Air Force to offer assignment-related stability while preserving administrative flexibility if the underlying assignment conditions cannot be met.

The Demo Program reflects another shift in retention strategy away from relying solely on monetary compensation. It attempts to influence retention decisions earlier than at the time of active-duty separation and through a combination of monetary and non-monetary tools.

FY26 Changes

In FY26, the Air Force introduced significant changes to the legacy AvB structure for high-risk aviation communities. For the first time, eligible communities such as fighters, bombers, and the U-2 were offered a flat annual payout regardless of contract length. This represents a notable departure from earlier structures in which annual payout levels increased with longer contractual commitments (Cox, 2026b).

The FY26 flat annual rate made the active-duty bonus structure more comparable to the bonus structure historically available in the Guard and Reserves. This comparison is relevant because the Guard and Reserve components compete directly with the active duty for the same experienced aviator population. By moving toward a flatter annual payout structure, the DAF appeared to be responding not only to active-duty retention pressures but also to the attractiveness of Reserve alternatives.

These FY26 changes paired with the FY24 Demo introduction reinforce the broader trend identified in this dissertation: pilot retention policy is increasingly moving beyond a single end-of-commitment bonus and retirement and toward a wider set of tools designed to address both financial and non-financial drivers of separation.

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