NPS-CE-26-027

ACQUISITION RESEARCH PROGRAM
SPONSORED REPORT SERIES

Cost-Benefit Analysis on Contracting Civilian Pilots as T-6 Instructors in Naval Flight Training

June 2025

ENS Christopher S. Bushnell, USN
ENS Gracie M. Ray, USN

Thesis Advisors: Kelley Poree, Lecturer
Dr. Simona L. Tick, Senior Lecturer

Department of Defense Management

Naval Postgraduate School

Prepared for the Naval Postgraduate School, Monterey, CA 93943.

ACQUISITION RESEARCH PROGRAM
DEPARTMENT OF DEFENSE MANAGEMENT
NAVAL POSTGRADUATE SCHOOL

The research presented in this report was supported by the Acquisition Research Program of the Department of Defense Management at the Naval Postgraduate School.

To request defense acquisition research, to become a research sponsor, or to print additional copies of reports, please contact the Acquisition Research Program (ARP) via email, arp@nps.edu or at 831-656-3793.

Acquisition Research Program
Department of defense management
Naval Postgraduate School

ABSTRACT

This report conducts a cost-benefit analysis (CBA) to evaluate the financial and operational feasibility of contracting civilian pilots as T-6 flight instructors in Naval Aviation Training. This analysis aims to provide a solution in response to a critical instructor pilot shortage which results in training delays. Three courses of action are assessed: maintaining the status quo utilizing exclusively military instructor pilots (MIPs), implementing a hybrid model with both MIPs and civilian instructor pilots (CIPs), and transitioning to a fully civilian instructor model. Data from Navy and Air Force programs, including the Air Force's PALACE Acquire Civilian Flight Instructor Internship (PAQ/CFII), is analyzed to determine salaries, training costs, and operational impacts over an eight-year period. The CBA determines that a fully civilianized approach offers the lowest total cost; however, the report recommends adopting the hybrid model as it achieves the best balance between cost efficiency, fleet readiness, and instructional continuity. Limitations including data assumptions are acknowledged and further stakeholder engagement is advised to refine implementation.

THIS PAGE INTENTIONALLY LEFT BLANK

NPS-CE-26-027

ACQUISITION RESEARCH PROGRAM
SPONSORED REPORT SERIES

Cost-Benefit Analysis on Contracting Civilian Pilots as T-6 Instructors in Naval Flight Training

June 2025

ENS Christopher S. Bushnell, USN
ENS Gracie M. Ray, USN

Thesis Advisors: Kelley Poree, Lecturer
Dr. Simona L. Tick, Senior Lecturer

Department of Defense Management

Naval Postgraduate School

Prepared for the Naval Postgraduate School, Monterey, CA 93943.

ACQUISITION RESEARCH PROGRAM
DEPARTMENT OF DEFENSE MANAGEMENT
NAVAL POSTGRADUATE SCHOOL

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF TABLES

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF ACRONYMS AND ABBREVIATIONS

BAH	basic allowance for housing
BAS	basic allowance for sustenance
CIP	civilian instructor pilot
CFII	certified flight instructor instrument
CFI	certified flight instructor
COA	course of action
CSA	continued service agreement
CTS	course training standards
DH	department head
FY	fiscal year
GS	general schedule
IP	instructor pilot
MIP	military instructor pilot
NAS	naval air station
NIFE	Naval Introductory Flight Evaluation
NPV	net present value
OCS	officer candidate school
OMB	office of management and budget
OPM	office of personnel management
OPNAV	office of the Chief of Naval Operations
PAQ	PALACE acquire
PIT	pilot instructor training
SNA	Student Naval Aviator
SNFO	Student Naval Flight Officer
TDY	temporary duty
T-6 Texan II	training aircraft

THIS PAGE INTENTIONALLY LEFT BLANK

EXECUTIVE SUMMARY

This thesis explores the feasibility and cost-effectiveness of integrating Civilian Instructor Pilots (CIPs) into the Navy's T-6B undergraduate flight training pipeline. Rising pilot production demands, growing backlogs of Student Naval Aviators (SNAs), and the need to reallocate Military Instructor Pilots (MIPs) to operational billets highlight a need for innovative personnel solutions. Drawing from the U.S. Air Force's PALACE Acquire (PAQ) Civilian Flight Instructor Internship model, this study assesses whether a similar construct could enhance Navy training throughput while improving cost efficiency (Department of the Air Force, 2022a; Department of the Air Force, 2022b).

Three Courses of Action (COAs) were evaluated: the current military-only model (COA 1), a hybrid model of 100 CIPs and 200 MIPs (COA 2), and a fully civilian model of 300 CIPs (COA 3). The analysis followed an ex-ante cost-benefit methodology consistent with OMB Circular A-94 and the frameworks in Boardman et al. (2017), identifying stakeholder impacts, calculating training and salary costs, and discounting future values using a 7% social rate of time preference (Office of Management and Budget, 1992; Boardman et al., 2017).

Costs for CIPs were derived from Navy sources and modeled on projected GS-2181 pay levels, training pipeline expenses, and required waivers due to lower initial flight hours (Office of Personnel Management, n.d.; PAQ CONOPS, 2022). While CIPs have higher upfront training costs, their long-term compensation is lower than that of their military counterparts—particularly when accounting for BAH, BAS, and post-service benefits. COA 2 emerged as the most operationally flexible and financially advantageous alternative, allowing MIPs to fill vacant fleet department head billets—a role whose absence carries substantial hidden costs in readiness and leadership (OUSD(P&R), 2023; Gerras et al., 2008).

The findings indicate that a properly structured CIP program could improve training throughput, reduce MIP manning gaps, and offer long-term savings, provided regulatory waivers and cultural integration are addressed. Future research should focus on the effects

of instructor mix on training outcomes, cost of unfilled billets, and broader civilian integration into training pipelines (USNI, 2024; Department of the Air Force, 2022b).

References

Boardman, A. E., Greenberg, D. H., Vining, A. R., & Weimer, D. L. (2017). *Cost-benefit analysis: Concepts and practice* (4th ed.). Cambridge University Press.

Department of the Air Force. (2022a, March 1). *PAQ Civilian Flight Instructor Internship Concept of Operations* (CONOPS).

Department of the Air Force. (2022b, November 30). *Operations PAQ CFII 2181 Individual Development Plan (IDP)*.

Gerras, S. J., Wong, L., & Allen, C. D. (2008). *Organizational culture: Applying a hybrid model to the U.S. Army*. U.S. Army War College.

Office of Management and Budget. (1992, October 29). *Guidelines and discount rates for benefit-cost analysis of federal programs (OMB Circular A-94)*. https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/circulars/A94/a094.pdf

Office of Personnel Management. (n.d.). *Aircraft Operation Series 2181*. https://www.opm.gov/policy-data-oversight/classification-qualifications/general-schedule-qualification-standards/2100/aircraft-operation-series-2181/

Office of the Under Secretary of Defense for Personnel and Readiness (OUSD[P&R]). (2023). *Military compensation: Active duty pay tables*.

U.S. Naval Institute. (2024, August). How to rebalance Naval Aviation training. *Proceedings Magazine*. https://www.usni.org/magazines/proceedings/2024/august/how-rebalance-naval-aviation-training

I. INTRODUCTION

The United States Navy is currently facing instructor pilot shortages within its undergraduate flight training pipeline. This shortage, specifically in the T-6 Primary Flight Training phase, has resulted in longer student wait times and bottlenecks in Naval Aviator production (Brophy & Chomic, 2024). According to CNATRA production planning data, only 264 instructor pilots are available for the T-6B, while full production capacity requires at least 300 (Chief of Naval Air Training, 2024). The operational impacts of this shortage are not limited to the training environment—when military instructor pilots are sent from operational billets to serve in flight school, the effects spread to the fleet in the form of unfilled department head tours, increased reliance on retention bonuses, and diminished fleet readiness (Office of the Chief of Naval Operations, 2023).

To handle this challenge, the Navy may benefit from implementing solutions already explored by its sister service. The U.S. Air Force's PALACE Acquire Civilian Flight Instructor Internship (PAQ/CFII) program was designed to supplement military instructor manning with a group of civilian certified flight instructors trained to instruct student pilots in an aircraft like the T-6 (Air Force Personnel Center, 2022). While this program has not yet been executed, its structure and mission offer an appropriate model for the Navy to consider. The question arises: could a similar integration of civilian pilots in the Navy's T-6 training pipeline enhance the efficiency of the training system and alleviate manning pressure on the operational fleet?

This thesis explores that question through a cost-benefit analysis (CBA) framework evaluating three proposed courses of action. The first maintains the status quo, relying solely on military instructors. The second adopts a hybrid model that incorporates 100 civilian instructor pilots (CIPs) alongside 200 military instructor pilots (MIPs). The third fully transitions the T-6 instructional force to 300 CIPs. Each option is evaluated across a range of criteria including total cost, training throughput, impact on fleet manning, and program feasibility.

The analysis uses an eight-year time horizon and applies a 7% discount rate in accordance with guidance from the Office of Management and Budget's Circular A-94 (Office of Management and Budget, 1992). It draws from Navy training syllabi, Department of Defense flight hour cost estimates, CNATRA production planning data, and civilian compensation schedules to construct a detailed model of both costs and benefits. Intangible factors such as mentorship, training culture, and the "bluing process" associated with military instruction are also considered (Grant, 1988).

Ultimately, this research aims to inform policy discussions about how best to structure the Navy's instructor force in a resource-constrained environment while meeting increasing demand for Naval Aviators. By comparing the economic and operational implications of multiple manning models, this study seeks to determine whether the integration of civilian pilots can offer a viable path forward.

II. BACKGROUND AND LITERATURE REVIEW

The Navy is facing a significant backlog in Naval Flight School, which has led to an underproduction of Naval Aviators and Naval Flight Officers. By the end of 2022, the wait to begin flight training exceeded 14 months" (Brophy & Chomic, 2024). This shortfall poses critical challenges to fleet readiness, resulting in a deficit of instructor pilots, unfilled second sea-tour billets, and department head tour shortages (Brophy & Chomic, 2024). Additionally, the burden placed on current Naval Aviators has intensified, exacerbating operational strain.

Naval Flight School is divided into four primary phases: Naval Introductory Flight Evaluation (NIFE), Primary, Intermediate, and Advanced, (Chief of Naval Air Training). Each phase is meticulously designed to progressively build the skills and knowledge required for Naval Aviators'. Among these, the Primary phase is a foundational stage that almost every Student Naval Aviator (SNA) and Student Naval Flight Officer (SNFO) completes. It serves as a critical gateway where students develop essential flying skills utilizing the T-6 Texan II, a tandem-seat, turboprop trainer, (U.S. Navy, 2021). The T-6 allows students to practice basic aviation principles, including flight control, navigation, and emergency procedures. One of the primary challenges lies in the complexity of maintaining the aircraft, coupled with delays in acquiring necessary components, which cannot be procured at the pace demanded by operational needs. Furthermore, the shortage of qualified pilots to train students on the T-6 significantly hinders the pipeline's efficiency.

The T-6 is one of several aircraft utilized by students as they advance through flight school, and other platforms within the training pipeline are similarly impacted by manpower shortages. To mitigate these challenges, the Navy contracts civilian pilots to serve as instructors for the T-45 Goshawk, a critical platform for advanced jet training, and the Cessna. This thesis will examine the potential outcome of implementing this solution to the T-6 platform. The Air Force has also considered this solution for their flight training program.

Through the PALACE Acquire (PAQ) Civilian Flight Instructor Internship Program, the Air Force aims to leverage the expertise of civilian pilots as T-6 instructors to address instructor shortfalls and maintain continuity of flight training operations. The primary objective of the PAQ/CFII program is to increase the production of pilots by integrating civilian instructors into the training pipeline. It seeks to reduce the reliance on active-duty IPs and enable operational units to retain more experienced aviators, establish a sustainable and long-term career path for civilian flight instructors within the Air Force Civilian Service (AFCS), and provide a structured three-year developmental program that ensures civilian instructors meet Air Force training standards, (Department of the Air Force, 2022). The program was conceived in response to similar pilot shortages the Navy currently faces. It was constructed into two phases, the first being a three-year developmental period. It begins with initial selection and eligibility requirements; candidates must be U.S. citizens with a degree from an FAA Part 141 accredited professional pilot program, hold a commercial pilot certificate with an instrument rating and a certified flight instructor (CFI) certificate, have a minimum of 50 hours of instructional flight time, and meet medical and security clearance requirements, (Department of the Air Force, 2022). Once selected, the candidate will move on to the training pipeline which takes approximately three years. In year one, candidates undergo Undergraduate Pilot Training (UPT) 2.5 and T-6 Pilot Instructor Training (PIT) to standardize their instruction capabilities, (Air Force Personnel Center, 2022). In years two through three civilian instructors accumulate 1,500 total flight hours, including 500 instructor hours through on-the-job training. They can also get additional qualifications including military simulator instructor (MSI) and academic instructor certifications. As interns, they start as GS-07 and are compensated with roughly $63,000, and upon graduation they are hired as GS-12 target GS-13 and are paid between $76,000 and $91,000, (Department of the Air Force, 2022). Phase two is called Operational Flight Instruction and has a five-year continued service agreement. The commitment ensures the Air Forces recoups their investment in training and secures long-term instructor stability. The program has been fully developed but has not been executed due to the absence of an approved flight hour waiver. This issue will be addressed in greater detail in the results and

discussion section of this paper. The estimated cost for each intern over the three-year developmental phase is $208,000 and includes salaries, TDY expenses, and training costs, (Air Force Personnel Center, 2023). The cost-benefit analysis provided by PAQ suggests the program would be financially beneficial as civilian instructors provide seven years of instructional service per one year of training investment and can reduce turnover, as they are not subject to frequent rotations like active-duty pilots, (Air Force Personnel Center, 2023). If implemented properly, the PAQ/CFII program could expand to 100 civilian flight instructors, (Department of the Air Force, 2022).

The principles outlined by the PAQ/CFII program would be applicable if the Navy were to implement a comparable initiative. Before assuming the role of teaching students, prospective T-6 flight instructors must successfully complete a comprehensive and rigorous syllabus established by the Naval Aviation Training Command. This curriculum requires instructors to undergo three distinct phases of training: ground training, flight training, and check flights, (Chief of Naval Air Training, 2023). Each phase is designed to progressively build the knowledge, skills, and situational awareness necessary for effective instruction. Furthermore, flight instructors are evaluated using a detailed grading system that assesses their performance against defined course training standards (CTS), (Chief of Naval Air Training, 2023). To maintain instructional proficiency, they also need to complete annual recertifications to ensure their skills and knowledge remain aligned with current operational and safety standards.

If the Navy were to contract civilian pilots as T-6 flight instructors, it would require a significant investment of time and resources to ensure these pilots meet the criteria outlined in the training syllabus. This would include aligning their qualifications, skills, and procedural knowledge with the rigorous standards required for instructing within the Naval Aviation Training Command framework.

THIS PAGE INTENTIONALLY LEFT BLANK

III. COSTS BENEFIT ANALYSIS

A. METHODOLOGY

Before analyzing the data, it is important to establish the framework that will guide this study. This section describes the generic cost-benefit analysis (CBA) methodology and then tailors it to the specifics of the Navy's T-6 undergraduate flight training program. The analysis evaluates whether supplementing MIPs with CIPs in a hybrid model can address instructor shortages, improve training throughput, and enhance fleet readiness.

Cost-benefit analysis is a systematic approach to comparing the expected costs and benefits of a project. Its purpose is to provide decision-makers with a tool to make rational and informed choices, particularly when allocating limited resources. In the context of this study, an ex-ante CBA is employed to evaluate the potential impact of implementing a hybrid civilian-military instructor model before its execution. The framework outlined in this section aligns with the Office of Management and Budget (OMB) Circular A-94 and draws from established CBA literature (Boardman, Greenberg, Vining, & Weimer, 2017; Office of Management and Budget [OMB], 1992).

In general, three types of CBAs exist. The ex-ante CBA assists in determining whether resources should be allocated to a proposed project. An ex-post CBA evaluates the outcomes of a project after implementation to determine whether the benefits justified the costs. Lastly, an in medias res CBA is conducted during a project's execution to assess its feasibility or need for modification. Since the Navy has not yet implemented a civilian instructor pilot program for the T-6, this analysis falls under the ex-ante category.

1. Cost-Benefit Analysis Model

The CBA model used in this study follows a nine-step framework:

1. Specify the set of alternative projects.
2. Decide whose benefits and costs count (standing).
3. Identify impact categories and measurement indicators.

4. Predict the impacts over the study period.
5. Monetize all impacts.
6. Discount benefits and costs to obtain present values.
7. Compute the net present value (NPV) of each alternative.
8. Perform a sensitivity analysis.
9. Make a recommendation.

a. Specify the Set of Alternative Projects

The first step in the analysis involves identifying and defining the alternatives to the current training model; this study considers three distinct options. The first alternative is to maintain the status quo, where only MIPs are utilized for training within the T-6 pipeline. This approach continues current practices and does not address the 33% median instructor shortfall (Office of the Chief of Naval Operations, 2023). The second alternative, the hybrid model, introduces 100 CIPs alongside 200 MIPs, theoretically filling the instructor shortfall, increasing training throughput, and filling operational billets. Finally, the third alternative is the fully civilian model, which transitions the T-6 training pipeline entirely to civilian instructors. This approach minimizes reliance on MIPs and reallocates them to operational roles in the fleet. Each alternative will be evaluated based on its costs, benefits, and feasibility.

b. Decide Whose Benefits and Costs Count (Standing)

In this analysis, the stakeholders whose benefits and costs are considered include Navy leadership, Congress, taxpayers, SNAs, and SNFOs. Navy leadership plays a critical role in policy decisions and resource allocation, making their perspective essential for determining feasibility and alignment with strategic goals. Congress oversees funding and policy implementation, ensuring that resources are used efficiently. Taxpayers fund the training programs and expect effective use of public funds, making cost-effectiveness a key concern. Finally, flight students are directly impacted by changes to the training model, as their learning outcomes, mentorship experiences, and readiness for fleet assignments

depend on the quality of instruction they receive (Grant, 1988). Each stakeholder's perspective will be accounted for in the evaluation of alternatives.

c. Identify Impact Categories and Measurement Indicators

The third step involves identifying the costs and benefits associated with each alternative and determining how they will be measured. Monetized costs include salaries and benefits for CIPs, which are based on GS-07 to GS-13 pay levels, and for MIPs at O-3/O-4 levels shown in Tables 1, 2, 4, and 5. Training costs are also considered and include the full certification pipeline for civilian instructors, comprising ground school, simulator training, and aircraft flight hours. These costs are based on Navy-specific training syllabi and estimated using standardized flight hour reimbursement rates and civilian flight training benchmarks (CNATRA, 2024; Department of Defense, 2022).

Monetized benefits focus on operational gains, such as increased fleet readiness from reassigning MIPs to active-duty roles. Additionally, potential savings from reduced retention bonuses for MIPs are considered (Office of the Chief of Naval Operations [OPNAV], 2024). Non-monetized costs include the potential loss of fleet expertise in training, as civilian instructors may lack the operational experience of MIPs (Grant, 1988). Cultural integration challenges, such as adjusting the training environment to accommodate CIPs, are also considered (Department of the Air Force, 2023). Non-monetized benefits include the stability provided by CIPs, who often serve longer than MIPs, and increased training throughput, which addresses the current instructor shortfall and ensures consistent progression of SNAs through the pipeline (Office of the Chief of Naval Operations, 2023; K. Knox, as cited in R. Sheppard, January 16, 2025).

d. Predict the Impacts Over the Study Period

The fourth step predicts the impacts of each alternative over an eight-year study period. In the first three years, high onboarding costs are expected as civilian instructors are hired, trained, and integrated into the T-6 pipeline. During the fourth year, CIPs begin contributing to training throughput, allowing MIPs to transition to operational fleet roles. By four to eight, the system reaches full operational capacity, with CIPs alleviating training

bottlenecks and maximizing fleet readiness (Department of the Air Force, 2022). This phased timeline provides a clear view of when costs are incurred, and benefits realized.

e. Monetize All Impacts

Monetizing impacts involves assigning dollar values to costs and benefits where possible. Civilian and military salaries are derived from GS and O-3/O-4 pay scales in Tables 1, 2, 4, and 5, while training costs are estimated using current Naval Aviation practices. The monetization process ensures that all financial impacts are quantified to enable direct comparison between alternatives. This step highlights areas where financial efficiencies can be achieved.

f. Discount Benefits and Costs to Obtain Present Values

To ensure comparability of costs and benefits over time, all financial impacts are discounted to their present value using the OMB-recommended 7% discount rate (OMB, 1992). Discounting accounts for the time value of money and provides a standardized approach to evaluating long-term projects. This step is critical for assessing the feasibility of each alternative and identifying the most cost-effective solution.

g. Compute the Net Present Value (NPV) of Each Alternative

The NPV of each alternative is calculated by subtracting the total discounted costs from the total discounted benefits. A positive NPV indicates that the benefits of an alternative outweigh its costs, making it the viable option. This analysis will primarily focus on the costs and the NPV will be negative. The COA with the lowest NPV will be considered the best option. This calculation provides a clear financial basis for comparing the status quo, hybrid model, and fully civilian model.

h. Perform Sensitivity Analysis

Sensitivity analysis examines how changes in key variables affect the outcomes of the CBA (Boardman et al., 2017). For this study, MIP salary, MIP and CIP training costs, discount rate, and cost of an unfilled second sea tour billet will be evaluated. This step ensures that the results remain robust under different scenarios and identifies areas of risk

or uncertainty that may impact the feasibility of each alternative. A sensitivity analysis provides decision-makers with a deeper understanding of potential challenges and trade-offs.

i. Make a Recommendation

Based on the findings of the CBA, the study will recommend the most cost-effective alternative, balancing quantitative financial values with qualitative operational considerations. External constraints, such as potential congressional resistance or cultural challenges, will also be considered. The recommendation aims to provide a clear path forward for addressing the Navy's instructor shortfall while maintaining training quality and fleet readiness.

2. Limitations

This study acknowledges several limitations. Data gaps exist due to the reliance on assumptions drawn from Air Force PAQ data and the absence of direct feedback from Navy training commands. Validation of these assumptions is pending further consultation with relevant stakeholders. Additionally, some operational and cultural impacts, such as the effects on mentorship dynamics, cannot be fully quantified and require qualitative assessment. The potential of decreasing incentive pay and reducing burnout in the fleet is discussed, but not fully quantified. Despite these limitations, the methodology provides a robust framework for evaluating the proposed hybrid instructor model.

B. COA 1: UTILIZING ONLY MILITARY PILOTS AS T-6 INSTRUCTORS (STATUS QUO)

This analysis assumes that 300 IPs are needed for full training capacity based on the FY24 PPF Gouge Sheet listed as Appendix A. According to the document, there are currently 264 IPs for the T-6. The document also states that the ratio between IPs and SNAs is 1:4 and 1:5. The Navy has a goal to produce between 1,100 and 1,200 Naval Aviators each year, (Brophy & Chomic, 2024). To calculate the total number of IPs needed, the total number of SNAs was divided by the 1:4 IP to SNA ratio which equals 300 IPs. This

analysis assumes the Navy is currently operating at 88% capacity. The total costs for an IP have been organized into Table 3 and can be referenced throughout the COA 1 analysis.

An instructor pilot in the Navy is typically an O3, Lieutenant, or an O4, Lieutenant Commander. An Officer's salary consists of three main components: basic pay, basic allowance for housing (BAH), and basic allowance for subsistence (BAS). Table 1 and Table 2 show a breakdown of the monthly compensation for a MIP depending on rank, years of service, location, and whether or not they have dependents. This analysis does not include monthly compensation for Aviation Career Incentive Pay. The lowest monthly compensation is $9,857 for an O3 in Whiting Field without dependents and no prior service as an enlisted sailor. The highest monthly compensation is $12,029 for an O3 with dependents and 20 years of service. Multiplying these figures by 12 months gives a minimum yearly salary of $118,279 and a maximum yearly salary of $144,354. The average salary for an O3 was obtained by taking the lowest and highest yearly salaries and dividing by two to obtain, $131,316. The average salary for an O4 was obtained using the same method and is $141,819. Assuming there is an even mix of O3 and O4 MIP's, the average annual salary for a MIP is $136,569 or a monthly salary of $11,381. The salary cost per month for 300 MIPs would be $3,414,198.

Table 1. Whiting Field IP Salary

Pay Grade	Basic Pay	BAH (Whiting Field)	BAS	Total
O3	$7,454	$2,082	$321	$9,857
O3E (10 Years)	$8,069	$2,217	$321	$10,607
O3E (20 Years)	$9,258	$2,217	$321	$11,795
O3D	$7,454	$2,262	$321	$10,037
O3ED (10 Years)	$8,069	$2,325	$321	$10,715
O3ED (20 Years)	$9,258	$2,325	$321	$11,903
O4	$9,075	$2,223	$321	$11,619
O4D	$9,075	$2,445	$321	$11,841

A breakdown of a MIP's salary in Whiting Field depending on rank, years of service, and whether they have dependents. Post Housing, Inc. (2025). NAS Whiting Field, FL – 2025 BAH Rates. WhitingFieldHousing.com. https://www.Whitingfieldhousing.com/bah-rates

Table 2. Corpus Christi IP Salary

Pay Grade	Basic Pay	BAH (Corpus Christi)	BAS	Total
O3	$7,454	$2,106	$321	$9,881
O3E (10 Years)	$8,069	$2,298	$321	$10,688
O3E (20 Years)	$9,258	$2,298	$321	$11,876
O3D	$7,454	$2,343	$321	$10,118
O3ED (10 Years)	$8,069	$2,451	$321	$10,841
O3ED (20 Years)	$9,258	$2,451	$321	$12,029
O4	$9,075	$2,304	$321	$11,700
O4D	$9,075	$2,622	$321	$12,018

A breakdown of a MIP's salary in Corpus Christi depending on rank, years of service, and whether they have dependents. Post Housing, Inc. (2025). NAS Corpus Christi, TX - 2025 BAH Rates. CorpusChristiNavalHousing.com. https://www.corpuschristinavalhousing.com/bah-rates

In military compensation tables, the "E" denotes prior enlisted service, which increases base pay relative to non-prior enlisted officers. Additionally, our analysis

assumes that instructors will have dependents, which entitles them to higher monthly BAH rates. Dependents are generally defined as a service member's spouse or children, though other relationships may qualify under specific conditions (U.S. Army Europe & Africa, 2018).

This paragraph explains the rationale behind selecting two representative profiles for MIPs: O-3E over 10 years of service and O-3E over 20 years of service. According to current OCS eligibility criteria, individuals must not have passed their 32nd birthday at the time of commissioning (Department of the Navy, 2025). If a sailor enlists at age 18 and later commissions through OCS just before turning 32, they will bring 14 years of enlisted service with them upon commissioning. Accounting for the typical six-year timeline to complete flight school and accrue sufficient experience to begin a production tour, such a pilot would have approximately 20 years of total service by the time they become an instructor. On the lower end, a sailor who completes their bachelor's degree in four years and commissions around age 22, would reach a production tour after 10 years of service. These two profiles—O-3E over 10 and O-3E over 20—therefore represent a realistic range of prior enlisted experience among instructor pilots, allowing our cost estimates to bracket the likely compensation levels.

In addition to salary costs, the Navy must also pay for MIPs to complete the T-6 Primary Flight Instructor Training Syllabus. Ground training is roughly 55 to 60 hours. The T-6 Aircraft Systems I class is 22.1 hours combined with Aircraft Systems II which is 12.9 hours totaling 35 hours. Emergency procedures, crew resource management, and course rules is roughly 20 hours. The second part of the syllabus is simulator training which can be 10 to 15 hours. Finally, flight training includes NATOPS qualification and check flights, formation and navigation training, and instrument training which is approximately 40 to 45 hours. There are no direct figures for the cost of ground school per hour, but it can be estimated. Civilian flight training costs for ground school range between $50 to $100 per hour. Using $75 as an average, the total cost of ground school would be between $4,125 and $4,500 per MIP. The total cost for 300 MIPs would be $1,293,750. Based on information found in the initial Navy training systems plan for the joint primary aircraft training system, it can be assumed the simulator cost per hour ranges from $500 to $700.

Using 12.5 hours as the average and multiplying by $600, the total cost per MIP for simulator training is $7,500. Multiplying this by 300 MIPs would be $2,250,000. The operating cost per hour for the T-6 was found in the Fiscal Year 2022 Department of Defense Fixed Wing and Helicopter Reimbursement Rates. These rates do not include the cost of fuel, maintenance, and personnel but provide a standardized cost framework. For the purposes of this analysis, the T-6 costs $2,612 per flight hour. The total cost per MIP to complete flight training would be between $104,480 and $117,540. The total cost for 300 IPs would be $33,303,000. The total cost for one MIP to complete the syllabus would be approximately $122,822.50 and the total cost for 300 IPs would be $36,846,750.00. These figures are all accounted for in Table 3.

Table 3. Cost of MIPs

Category	Cost (Per IP)	Cost (300 IPs)
Salary (Annual)	$136,568	$40,970,358
Ground School	$4,313	$1,293,750
Simulators	$7,500	$2,250,000
Flight Training	$111,010	$33,303,000
Total Cost	$259,390	$77,817,108

The total cost per MIP and for 300 MIPs for salary and completion of the T-6 Primary Flight Instructor Training Syllabus.

The costs in Table 3 outline salary and syllabus training only. They do not include the cost of pulling trained pilots from fleet billets to fill MIP quotas. The turnover and retraining costs are also absent; MIPs rotate every 2 to 3 years which can add to operational inefficiency.

An additional cost is unfilled department head (DH) billets in the Navy which represent not just gaps in personnel but measurable losses in operational value. A typical DH—usually an O-4 with 10 or more years of service stationed at locations like NAS

Whiting Field or NAS Corpus Christi—receives an estimated annual compensation of $140,000, including base pay, BAH, and BAS (U.S. Navy, 2024). However, the impact of a DH extends beyond this direct compensation. In organizational leadership literature, mid-level managers are often assessed to provide 2–3 times their salary in value due to their influence on team productivity, morale, decision-making, and continuity of operations (Becker, Huselid, & Ulrich, 2001). This multiplier can be applied in military contexts, where leadership directly affects mission execution, junior officer development, and unit cohesion (Rand Corporation, 2022; Schultz, 2024). When these billets go unfilled, the Navy loses not only that leadership capacity but also risks compounding readiness and retention issues. Leadership gaps—whether from missing instructor pilots or unassigned department heads—create delays in training pipelines and operational coverage, leading to a burden on remaining staff and degradation of overall fleet efficiency (Schultz, 2024). Furthermore, Major Bruce Grant in his writings from the Air Command and Staff College emphasizes that vacancies in key leadership billets increase burnout and the risk of early separation, a trend supported by RAND studies estimating the cost of replacing a trained officer at over $300,000 (Rand Corporation, 2022; Grant, 1988). Thus, the opportunity cost of a vacant DH billet may reasonably be estimated between $280,000 and $420,000 annually, assuming a 2–3x value multiplier on direct compensation—with broader consequences for readiness, training capacity, and retention across the Naval Aviation Enterprise.

The U.S. Naval Air Forces (2024) states roughly 19% of second sea tour billets are unfilled. There are 904 total billets multiplied by 0.19 results in 171.76. Taking 172 unfilled billets multiplied by the estimated cost of an unfilled billet, $350,000, results in $60,200,000. Continuing to rely solely on MIPs places an additional burden on the fleet due to unfilled second sea tour billets. The cost has been valued by the number of billets that remain unfilled.

C. COA 2: UTILIZING A HYBRID MODEL OF MILITARY PILOTS AND CIVILIAN CFII'S AS T-6B INSTRUCTORS

With the same assumptions made in COA 1, the hybrid model would require 300 total instructor pilots, 100 CIPs and 200 MIPs. The total costs for a CIP and a MIP can be found in Table 6 and Table 3, respectively.

This model is adapted from the PALACE Acquire Civilian Flight Instructor Internship (PAQ/CFII) Concept of Operations, leveraging best practices from the Air Force's civilian instructor framework while ensuring compatibility with Navy flight training requirements. Civilian certified flight instructors - instrument (CFIIs) will be contracted by the Navy to fill 100 CIP roles across Training Wing 4 (NAS Corpus Christi) and Training Wing 5 (NAS Whiting Field). These CIPs will be government employees under the GS-2181-13 job classification, receiving standard civil service compensation and benefits.

To qualify for a CIP contract, candidates must have graduated from a Part 141 accredited university with a professional pilot degree and maintained a minimum GPA of 2.95. Applicants must be no more than two years removed from their graduation date at the time of contracting. They are also required to hold an FAA Commercial Pilot Certificate with an instrument rating for single or multi-engine fixed-wing aircraft and possess an FAA Certified Flight Instructor (CFI) certificate with an instrument rating. Additionally, candidates must have at least 300 hours of total flight time, with 50 hours of instructor flight time in a fixed-wing aircraft. To ensure they meet the physical demands of the role, candidates must maintain a current FAA Class I or II Medical Certificate and pass a Navy flight physical/medical exam required for ejection seat aircraft.

The CIP contract spans eight years, consisting of three years of training followed by five years of continued service designated as the payback period. CIPs will begin their contract as GS-07 step four employees and advance through GS pay levels as they complete training and gain experience. Unlike military instructors, CIPs will not receive BAH or BAS, but they may be eligible for relocation bonuses up to 25% of their initial salary. Table 4 and Table 5 outline the projected compensation for CIPs over the eight-year contract,

assuming GS level advancement each year. Salaries are based on FY25 GS pay scales, adjusted for Corpus Christi and Whiting Field locality rates.

Table 4. CIP Salary in Whiting Field

GS GRADE	GS-7-4	GS-9-4	GS-11-4	GS-13-4	GS-13-5	GS-13-6	GS-13-7	GS-13-8
Basic Pay	$54,957	$67,222	$81,331	$115,922	$119,435	$122,948	$126,461	$129,974
Relocation Bonus	$13,739	-	-	-	-	-	-	-
Total	$68,696	$67,222	$81,331	$115,922	$119,435	$122,948	$126,461	$129,974

A breakdown of a CIP's salary in Whiting Field depending on GS level and step. General Schedule. (2024). Milton, Florida (FL) government salary rates. https://www.generalschedule.org/states/florida/milton-fl

Table 5. CIP Salary in Corpus Christi

GS GRADE	GS-7-4	GS-9-4	GS-11-4	GS-13-4	GS-13-5	GS-13-6	GS-13-7	GS-13-8
Basic Pay	$55,255	$67,549	$81,727	$116,487	$120,017	$123,547	$127,077	$130,607
Relocation Bonus	$13,814	-	-	-	-	-	-	-
Total	$69,069	$67,549	$81,727	$116,487	$120,017	$123,547	$127,077	$130,607

A breakdown of a CIP's salary in Corpus Christi depending on GS level and step. General Schedule. (2024). Corpus Christi, Texas (TX) government salary rates. https://www.generalschedule.org/localities/corpus-christi

In Whiting Field, first-year compensation for a CIP is $68,696, which includes a one-time relocation bonus of 25% of their initial salary. A GS-07 step four salary at this location is $54,957, with the relocation bonus totaling $13,739. In the second year, CIPs advance to GS-09 step four, earning an annual salary of $67,222. By the third year, they progress to GS-11 step four, receiving $81,331 annually. In the fourth year, which marks the start of their continued service agreement (CSA), CIPs advance to GS-13 step four, earning $115,922. Over the following four years, CIPs continue advancing within the GS-13 step structure, reaching $129,974 at step eight by their eighth year.

Similarly, in Corpus Christi, first-year compensation for a CIP is $69,069, reflecting a GS-07 step four salary of $55,255 plus a relocation bonus of $13,814. By the second year, they advance to GS-09 step four, earning $67,549 annually. In the third year, they move to GS-11 step four, receiving $81,727. The fourth year, the first under their CSA, sees them advance to GS-13 step four, with an annual salary of $116,487. As they continue progressing through GS-13 steps, they reach a final salary of $130,607 at step eight by their eighth year. If a CIP continues to instruct beyond the CSA period, they may advance further within the GS-13 pay scale. This analysis assumes that 50 CIPs would complete their contract for eight years at Whiting Field and 50 CIPs at Corpus Christi. The total cost of one CIP at Whiting Field for the duration of the contract would be $832,989. The total cost of one CIP at Corpus Christi for the duration of the contract would be $836,080. The total cost of 50 CIPs at Whiting Field over eight years would be $41,649,450. The total cost of 50 CIPs at Corpus Christi over eight years would be $41,804,000. The total cost of 100 contracted CIPs in the GS-2181 position would be $83,453,450.

In addition to salary costs, the Navy must cover the expenses associated with training CIPs to become qualified T-6 instructors. CIPs must complete two phases of training: primary flight training and primary flight instructor training. These phases include ground training, simulator training, and in-air flight training, each with associated costs.

The primary flight training program for SNAs in the T-6 joint primary pilot training (JPPT) curriculum consists of 68.0 hours of ground training, 93.1 hours of simulator training, and 86.6 total flight hours; CIPs would go through this same training. Taking the same cost assumptions from COA 1, the ground training cost per CIP is estimated using an average $75 per hour rate, bringing the total to $5,100 per CIP and $510,000 for 100 CIPs. Simulator training, which includes training on contact flight procedures, instrument flight, IFR flight planning, and navigation, follows the cost per hour range established in COA 1 at $600 per hour, leading to a total simulator cost of $55,860 per CIP and $5,586,000 for 100 CIPs. Flight training, requiring 86.6 flight hours, follows the T-6's standardized operating cost of $2,612 per flight hour, bringing the total to $226,059 per CIP and $22,605,900 for 100 CIPs.

Following primary flight training, CIPs must complete T-6 primary flight instructor training, like their military counterparts. Ground training for this phase is estimated at 55 to 60 hours at the same $75 per hour rate, bringing the total to $4,312 per CIP and $431,250 for 100 CIPs. Simulator training, which lasts approximately 12.5 hours, is again calculated using the $600 per hour cost assumption, leading to $7,500 per CIP and $750,000 for 100 CIPs. Flight training, estimated between 40–45 hours, takes the same cost assumptions from COA 1, averaging $111,010 per CIP, totaling $11,101,000 for 100 CIPs. The total cost to train 100 CIPs through both phases is $40,984,100. The total training costs with salary can be found in Table 6.

Table 6. CIP Training Costs

Category	Cost (Per CIP)	Cost (100 CIPs)
Salary (Contract)	$834,536	$83,453,550
Ground School	$9,412	$941,200
Simulators	$63,360	$6,336,000
Flight Training	$337,069	$33,706,900
Total Cost	$1,244,376	$124,437,550

The total cost per CIP and for 100 CIPs for salary and to complete the T-6 primary flight training and primary flight instructor training syllabi averaged between Corpus Christi and Whiting Field.

COA 2 also includes the cost of 200 MIPs salary and training. The annual salary of a MIP is shown in Table 3 to be $136,568. The annual salary was multiplied by 200 MIPs over the course of eight years for a total of $218,508,576. It costs $122,823 to train each MIP. Assuming MIPs rotate every two years, 200 MIPs would need to be trained four separate times. $122,823 multiplied by 200 MIPs for four rotations is $98,258,000. The total cost for 200 MIPs over the course of eight years is $316,766,576.

Implementing the hybrid COA model—consisting of 100 CIPs and 200 MIPs—offers multiple potential benefits across operational efficiency, cost savings, and force

readiness. Most notably, this approach would alleviate persistent shortages of MIPs in the training pipeline while enabling a more flexible, resilient instructional force.

One of the most direct advantages is cost savings over the life of the program. Civilian instructors receive competitive GS salaries, but do not require BAH, BAS, or military retirement benefits. Additionally, incorporating civilians into instructor roles also helps to relieve manning pressure on the fleet. By assigning CIPs to training squadrons, the Navy can reallocate some qualified military pilots to operational units that are currently under-resourced. This helps meet growing demands for aviators at sea and reduces the burden on existing military personnel who are being asked to take on multiple billets or extend sea tours, as described in recent Navy retention reports (Brophy & Chomic, 2024). With the assumption that contracting 100 CIPs would allow 100 potential MIPs to fill second sea tour billets, the Navy could potentially benefit by $35,000,000. This could still leave 72 billets unfilled but would reduce the overall burden placed on the fleet.

D. COA 3: UTILIZING ONLY CIVILIAN PILOTS AS T-6B INSTRUCTORS

As stated in COA 1, this analysis assumes 300 IPs are required to operate the T-6 at 100% efficiency. The cost of one CIP over the course of 8 years is $1,244,376 as seen in Table 6. The total cost of 300 CIPs to include training and salary is $373,312,650.

Contracting 300 CIPs could allow potential MIPs to fill unmanned second sea tour billets. There are currently 172 unfilled second sea tour billets in Naval Aviation. Assuming the benefit of filling each billet is $350,000 and the Navy could fill all 172 the result would be $60,200,000 in value.

THIS PAGE INTENTIONALLY LEFT BLANK

IV. RESULTS AND DISCUSSION

A. RESULTS

The results section analyzes the 3 COAs together in Table 7 to determine which is the optimal solution. Each COA will be compared over an eight-year time frame. Eight years was selected due to the nature of the CIPs contract. It takes each CIP approximately three years to complete the flight training and afterwards they are contracted for five years. As stated in COA 1 and Table 3, the average annual salary for a MIP is $136,568. When this figure is multiplied by eight years and 300 MIPs the total is $327,762,864. The total cost for one MIP to complete the T-6 training syllabus is estimated to be $122,823. Assuming MIPs rotate every two years, a new group of 300 MIPs would need to be trained four times over the course of eight years. $122,823 is multiplied by 300 MIPs and four rotations to get $147,387,000 for total training costs over an eight-year period. COA 1 does not include the benefit of filling unattended fleet billets because it only utilizes MIPs.

COA 2 is a hybrid model that includes 100 CIPs and 200 MIPs. Over the course of eight years, the total salary for 100 CIPs is $83,453,550 and the total salary for 200 MIPs is $218,508,576. Combined the total cost of salaries over an eight-year period for COA 2 is $301,962,126. The training costs for 100 CIPs over an eight-year period are $40,984,000. It would cost $98,258,000 to train 200 MIPs every two years over an eight-year period. The total training cost is $139,242,000.

COA 3 utilizes only CIPs. The salary cost for one CIP over eight years is $834,536 as seen in Table 6. This figure multiplied by 300 is $250,360,650. The total cost to train one CIP is $409,840. This figure multiplied by 300 is $122,952,000. The results shown in Table 7 indicate COA 3 is the most cost effective.

Table 7. Raw Totals of Each COA

COA	Salary	Training	Benefits	Total NPV
COA 1 (MIP)	$327,763,008	$147,387,000	$60,200,000	$535,350,008
COA 2 (Hybrid)	$301,962,126	$139,242,000	$35,000,000	$406,204,126
COA 3 (CIP)	$250,360,650	$122,952,000	$60,200,000	$313,112,650

A comparison of the costs and benefits of each course of action for 300 IPs over eight years. Red indicates a negative value and green indicates a positive value.

To obtain the final NPV value the following calculations were performed and recorded in Table 8. First, the discount factor was found using equation (1) with r being 0.07, the 7% discount rate, and t being 1 to 8. The final value of the discount factor is 5.97. To determine the NPV of salary, the annual salary was multiplied by the discount factor. The NPV of training was determined by dividing the total training cost by 1.07, the year one discounting for one-time training costs.

Table 8. Total NPV Values of Each COA

COA	NPV Salary	NPV Training	NPV Benefits	Total NPV
COA 1 (MIP)	$244,646,345	$133,732,944	-	$378,379,289
COA 2 (Hybrid)	$225,388,249	$127,458,100	$26,124,431	$326,721,918
COA 3 (CIP)	$186,872,272	$114,908,411	$44,934,021	$256,846,662

The total NPV values for each COA at a 7% discount rate.

$$DF_t = \frac{1}{(1+r)^t} \quad (1)$$

The NPV of COA 1 was determined as follows. The total annual salary over eight years is $327,763,008. That figure divided by eight gives the real annual salary of $40,970,376. Multiplying that by the discount factor 5.97 equals $244,646,345, the NPV of salary. It is assumed the military needs to train 300 MIPs every two years in years one, three, five, and seven. The total cost to train 300 MIPs is $36,846,750. Multiplying that figure by the discount factor for each training year the totals come to $34,436,215, $30,077,924, $26,271,224, and $22,946,304. The sum of these numbers together is the total NVP of training and equals $113,731,666. There is no assumed benefit in COA 1 as all available second sea tour billets remain unfilled.

The NPV of COA 3 was performed as follows. The total salary over eight years $250,360,650 was divided by eight to get $31,295,081. This figure was multiplied by the discount factor 5.97 which resulted in $186,872,272 the NPV for salary. The training cost is assumed as a lump sum in year one. The figure $122,952,000 was divided by the year one discounting 1.07 to yield $114,908,411 the NPV of training. COA 3 assumes all 172 available billets can be filled. The figure $60,200,000 was divided by eight to yield $7,525,000. This figure was then multiplied by the discount factor to obtain the NPV for benefits which is $44,934,021.

The NPV of COA 2 was performed as follows. The total salary $301,962,126 was divided by eight then multiplied by the discount factor. The NPV for salary is $225,388,249. The training is split between 1/3 CIPs and 2/3 MIPs. Taking the NPV of training found for COA 1 and multiplying it by 2/3 yields $89,155,296. The NPV of training from COA 3 was multiplied by 1/3 to be $38,302,804. These values were added together to find the NPV of training for COA 2 $127,458,100. It is assumed COA 2 fills 100 available second sea tour billets. The NPV for benefits from COA 3 was taken and multiplied by 100/172 to yield $26,124,431. Total NPV of each COA was then calculated by adding NPV of salary and training then subtracting NPV of benefits.

B. SENSITIVITY ANALYSIS

The sensitivity analysis addresses how key variables impact each COA. The MIP salary growth will be assessed as salaries drive many long-term costs in this CBA. The training costs for both MIPs and CIPs will be discussed as they are high up-front investments. Additionally, the discount rate and billet value will be assessed. Ranges for each variable were selected and are shown in Table 9.

Table 9. Key Variables Tested

Variable	Baseline	Range Tested
Discount Rate	7%	5%, 10%
MIP Salary Growth	$136,567.86	±10%
MIP Training Cost	$122,822.50	±20%
CIP Training Cost	$409,840	±20%
Billet Value	$350,000	$250,000 - $450,000

Each variable tested in the sensitivity analysis with their baseline and the new ranges tested.

The total NPV for each COA using the new discount factors was calculated first. The 5% and 10% discount rates were found using equation (1) with t equal to 1 through 8. The discount factor for 5% is 6.46 and the discount factor for 10% is 5.33. The salaries for COA 1 with the new discount factors are $264,800,257 and $218,573,932, respectively. The training costs for COA 1 are assumed to be spread in years one, three, five, and seven. The total training cost each cycle is $36,846,750. Dividing this figure by 1.05^t for a 5% discount rate and 1.10^t for a 10% discount rate yields $121,978,441 and $102,967,696, respectively. The total NPV for COA 1 is the cost of salary and training shown in Table 10.

COA 3 has a total salary cost of $250,360,650. This figure divided by eight then multiplied by the new discount factors results in $202,266,768 for a 5% discount rate and $166,956,948 for a 10% discount rate. The total training cost is $122,952,000 is divided by 1.05 and 1.10 to yield $117,097,142 and $111,774,546. The overall benefit of filled billets is $60,200,000. This figure was divided by eight then multiplied by the two discount factors. The total benefit for a 5% discount rate was $48,635,676 and $40,145,320 for a

10% discount rate. The total NPV was calculated by adding salary and training costs then subtracting the benefit.

The same steps were taken to determine the salary and benefit for COA 2. The salary was determined to be $243,955,683 for a discount rate of 5% and $201,368,207 for a discount rate of 10%. The NPV of the benefit is $28,276,556 and $23,340,302, respectively. The NPV of training used values found during the sensitivity analysis of COAs 1 and 3. The NPV figures from COA 1 were multiplied by 2/3 and added to the NPV figures from COA 3 which had been multiplied by 1/3. The total training NPV for 5% and 10% are $120,351,341 and $105,903,312. The total NPV values can be found in Table 10.

Table 10. Sensitivity Analysis Table

Scenario	COA 1 NPV	COA 2 NPV	COA 3 NPV	Most Cost Effective
Baseline	$378,379,289	$326,721,918	$256,846,662	COA 3
Discount Rate 5%	$386,778,698	$336,030,469	$270,728,236	COA 3
Discount Rate 10%	$321,541,628	$283,931,217	$238,586,175	COA 3
MIP Salary +10%	$402,843,924	$310,412,162	$256,846,662	COA 3
MIP Salary -10%	$353,914,655	$241,698,005	$256,846,662	COA 2
MIP Training +20%	$405,125,878	$344,552,977	$256,846,662	COA 3
MIP Training -20%	$351,632,700	$308,890,859	$256,846,662	COA 3
CIP Training +20%	$378,379,289	$334,382,479	$279,828,344	COA 3
CIP Training -20%	$378,379,289	$319,061,357	$233,864,980	COA 3
Billet Value $250K	$378,379,289	$334,186,041	$269,684,954	COA 3
Billet Value $450K	$378,379,289	$319,257,795	$244,008,370	COA 3

A comparison of each sensitivity analysis and the most cost-effective COA.

Adjusting the MIP salary by an increase or decrease in 10% could also influence which COA is most cost-effective. First, the NPV salary was multiplied by 0.90 and 1.10 which resulted in $220,181,711 and $269,110,980. These values were then added to the existing NPV for trainings. MIPs take up 2/3 of the IPs in COA 2. Therefore, 2/3 multiplied by the COA 1 NPV salary will be equivalent to 2/3 of the COA 2 NPV salary. The cost of 200 MIPs is $163,097,563. The static CIP salary portion is the total COA 2 salary minus the salary of 200 MIPs which equals $62,290,686. Now we can multiply the cost of 200 MIPs by 0.90 and 1.10 and add the static cost of 100 CIPs to determine each NPV value for COA 2. The total NPV for salary for a 10% decrease is $209,078,493 and $241,698,005 for a 10% increase. These values are then added to the existing training costs and the benefit is subtracted. COA 3 NPV remains at the baseline because MIP salary does not impact the cost.

To determine the impact training cost has on COA 1 the initial training NPV $133,732,944 was multiplied by 1.20 and 0.80 which resulted in $160,479,533 and $106,986,355, respectively. These values were added to the initial NPV for salary for COA 1. To determine the new value for COA 2 NPV the MIP training cost was divided by 2/3 to yield $89,155,296. This value was multiplied by 1.20 and 0.80 then the training value of 100 CIPs was added. The training value for COA 3 was multiplied by 1/3 to determine the cost of training 100 CIPs which resulted in $38,302,804. The training value with a 20% increase in MIP training is $145,289,159 and $109,627,041 for a decrease in 20%. These values were then totaled with the initial salary and benefits values. The NPV of COA 3 remains unchanged.

If training costs for CIPs were to increase or decrease by 20% the total NPV would be impacted. The training costs of COA 3 were multiplied by 1.20 and 0.80 to yield $137,890,093 and $91,926,729, respectively. These values were totaled with the existing NPV values for salary and benefits. The cost of training 100 CIPs was determined in the previous paragraph. This value was multiplied by 1.20 and 0.80 then the cost of training 200 MIPs was added. These totals were $135,118,661 and $119,797,539. These values were then totaled with the salary and benefits NPVs. The NPV for COA 1 remains unchanged.

For the final sensitivity analysis on billet value the discount rate is 7%. COA 2 is assumed to fill 100 billets. This number is multiplied by the new billet values, $250K and $450K, divided by eight then multiplied by the discount factor. These values total to $18,660,308 and $33,588,554. These figures are then subtracted from the salary and training costs to obtain a total. The same process was repeated for COA 3. COA 1 NPV remains unchanged.

C. DISCUSSION

The result indicates COA 3 is the most cost-effective solution, but there are significant factors that could not be quantified and should be included in this analysis.

The increased stability and continuity of instruction is another key benefit. Brophy and Chomic's article outlines that "military instructors move every two to three years […] increasing the churn in the training pipeline," whereas a stable civilian workforce could mitigate these disruptions. This stability enables them to remain in instructor roles for the full duration of their contracts, allowing for deeper institutional knowledge, improved standardization, and fewer disruptions to student training flow. As noted in the Civilianizing the Instructor Force report, civilian instructors tend to demonstrate stronger force retention due to fewer incentives to transfer or separate early, improving training consistency over time (Grant, 1988).

From a recruitment and pipeline resilience standpoint, COA 2 opens opportunities for high-performing civilian flight instructors from Part 141-accredited institutions to enter government service and grow into professional aviation roles (Air Force Personnel Center, 2022). This thesis explores the potential for a clearly defined internship-to-instructor pathway that conceptually mirrors the Air Force's PALACE Acquire program, with the goal of expanding the pool of eligible instructors at a time when military pilot production by itself may not meet training throughput goals (Air Force Personnel Center, 2022). The GS structure also offers civilians predictable career progression and the ability to specialize in instructional duties without competing for operational billets (Air Force Personnel Center, 2022).

There are concerns about the potential erosion of mentorship or warfighting context when using civilians. COA 2 preserves a critical mass of MIPs (200) to ensure the transfer of combat experience, operational culture, and mentorship to Student Naval Aviators (SNAs). This balance ensures that SNAs continue to receive vital operational knowledge and career guidance from active-duty mentors while leveraging civilians for standardization and instructional bandwidth. The "bluing process" remains intact while maximizing instructional throughput (Grant, 1988). Overall, while COA 3 is the most effective, COA 2 offers benefits that could not be quantified in this analysis. It alleviates the instructor pilot shortage while still preserving mentorship and military culture. Integrating CIPs can improve fleet readiness by reallocating 100 MIPs to operational billets. COA 2 also enhances continuity and standardization because civilian instructors have eight-year contracts which reduces disruptions and increases consistency in training delivery. It avoids a full cultural disruption, unlike COA 3, by retaining some MIPs and reduces military training rotation costs.

The hybrid model mirrors a proven, historical model. The Navy has already contracted civilian instructors in the T-45 and helicopter training pipelines with measurable success (Brophy & Chomic, 2024). While the PALACE Acquire program did not ultimately reach execution, the supporting documentation and planning from the Air Force provide a framework for qualification, compensation, and long-term integration of civilian instructors. These lessons are directly transferrable to the Navy's T-6 platform and could enable an efficient and responsible rollout at scale. Moreover, COA 2 will help alleviate issues from not filling second sea tour billets.

COA 2 offers benefits that address both immediate training demands and longer-term readiness objectives. By relieving pressure on the fleet, improving training continuity, and expanding the instructor talent pipeline, the hybrid model creates a balance between cost-effective manning and operational effectiveness. It represents a realistic and flexible path forward—serving as a viable middle ground between the status quo and full civilianization—for meeting the Navy's undergraduate flight training requirements in the years ahead.

As our proposed solutions in both the hybrid and fully civilian models stand, pilots onboarded with the minimum threshold of 300 flight hours would complete primary and instructor flight training with approximately 430 total flight hours. According to the Office of Personnel Management (OPM), pilots applying for a GS-2181 position are required to have 1,500 hours of total flight time, unless "up to one-half of the flight hours may be waived provided the individual's total background reflects the ability to perform the duties of the position safely" (Office of Personnel Management, n.d.). This implies that, even with a waiver, civilian instructors would still need to meet a minimum of 1,125 hours to satisfy 75% of the requirement. Therefore, as highlighted in the PALACE Acquire Concept of Operations (Air Force Personnel Center, 2022), obtaining a GS-2181 qualification waiver will be essential to reduce the burden of the hour requirement.

The design of the eight-year CIP program supports this goal, allowing civilian pilots to accumulate the remaining hours after completing training. With approximately 18 months required for initial flight and instructor qualification, CIPs would then need an additional 18 months to accrue the remaining 700–1,070 flight hours needed to meet waiver-adjusted qualifications. It is important to note that our current cost estimates for both the hybrid and fully civilian models do not include the cost of acquiring these additional flight hours; the analysis assumes a waiver would be granted based on a 430-hour flight background.

THIS PAGE INTENTIONALLY LEFT BLANK

V. CONCLUSION

A. CONCLUSION

This thesis evaluated the feasibility, cost-effectiveness, and operational implications of introducing CIPs into the Navy's T-6B training pipeline. By comparing three Courses of Action—continuing with a fully military instructor model, transitioning to a hybrid model with 100 CIPs, and adopting a fully civilianized 300-CIP structure—the study provides a framework for decision-makers to weigh the benefits of expanding the instructor pool without compromising training throughput or readiness.

Results show that while CIPs require more upfront investment due to initial training and onboarding, their long-term compensation is significantly lower than that of MIPs. Redirecting MIPs back into fleet department head billets addresses critical operational shortfalls—effectively generating both personnel and monetary returns. The hybrid model emerged as a compelling alternative, offering flexibility, readiness gains, and cost savings that could ease pressure on both the training pipeline and operational units (Department of the Air Force, 2022a; USNI, 2024).

This thesis does not assume the current Navy is moving forward with this construct. Rather, it provides a structured cost-benefit analysis to determine whether a CIP program, modeled after the Air Force's PALACE Acquire construct, could feasibly meet Navy training needs (Department of the Air Force, 2022b). While the model demonstrates strong potential, successful implementation would require waiver approvals, cultural integration planning, and long-term evaluation of CIP performance.

B. FUTURE RESEARCH

Future research can be conducted with long-term implementation, readiness outcomes, and personnel policy alignment in mind. Several areas for future exploration include:

1. I recommend future research to compare student throughput, attrition, and training quality under Civilian Instructor Pilots (CIPs) versus Military

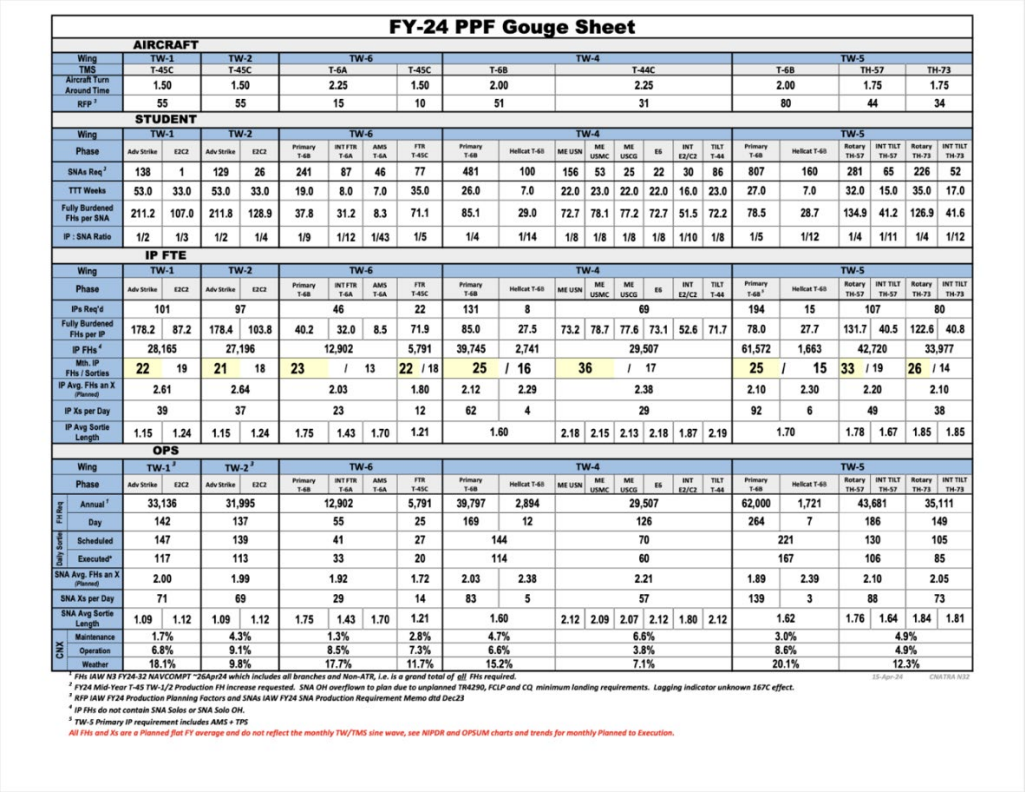
Instructor Pilots (MIPs). This would validate assumptions about training equivalency between civilian and military instruction.

2. I recommend additional research to incorporate full life cycle costs and benefits—including indirect savings such as reduced PCS costs, housing allowances, and retirement obligations—to refine the net present value model.

3. I recommend building a robust sensitivity analysis around key assumptions such as waiver approval rates, retention trends, instructor flight hour accumulation, and discount rates.

4. I recommend further research on how reassigning MIPs to fleet billets affects readiness metrics and department head manning—quantifying the operational gains beyond training cost savings.

APPENDIX. FISCAL YEAR 2024 PPF GOUGE SHEET



FY-24 PPF Gouge Sheet

AIRCRAFT

Wing	TW-1	TW-2	TW-6		TW-4		TW-5		
TMS	T-45C	T-45C	T-6A	T-45C	T-6B	T-44C	T-6B	TH-57	TH-73
Aircraft Turn Around Time	1.50	1.50	2.25	1.50	2.00	2.25	2.00	1.75	1.75
RFP [3]	55	55	15	10	51	31	80	44	34

STUDENT

Wing	TW-1		TW-2		TW-6				TW-4							TW-5					
Phase	Adv Strike	E2C2	Adv Strike	E2C2	Primary T-6B	INT FTR T-6A	AMS T-6A	FTR T-45C	Primary T-6B	Hellcat T-6B	ME USN	ME USMC	ME USCG	E6	INT E2/C2	TILT T-44	Primary T-6B	Hellcat T-6B	Rotary TH-57	INT TILT TH-57	Rotary TH-73	INT TILT TH-73
SNAs Req [3]	138	1	129	26	241	87	46	77	481	100	156	53	25	22	30	86	807	160	281	65	226	52
TTT Weeks	53.0	33.0	53.0	33.0	19.0	8.0	7.0	35.0	26.0	7.0	22.0	23.0	22.0	22.0	16.0	23.0	27.0	7.0	32.0	15.0	35.0	17.0
Fully Burdened FHs per SNA	211.2	107.0	211.8	128.9	37.8	31.2	8.3	71.1	85.1	29.0	72.7	78.1	77.2	72.7	51.5	72.2	78.5	28.7	134.9	41.2	126.9	41.6
IP : SNA Ratio	1/2	1/3	1/2	1/4	1/9	1/12	1/43	1/5	1/4	1/14	1/8	1/8	1/8	1/8	1/10	1/8	1/5	1/12	1/4	1/11	1/4	1/12

IP FTE

Wing	TW-1		TW-2		TW-6				TW-4							TW-5					
Phase	Adv Strike	E2C2	Adv Strike	E2C2	Primary T-6B	INT FTR T-6A	AMS T-6A	FTR T-45C	Primary T-6B	Hellcat T-6B	ME USN	ME USMC	ME USCG	E6	INT E2/C2	TILT T-44	Primary T-6B [3]	Hellcat T-6B	Rotary TH-57	INT TILT TH-57	Rotary TH-73	INT TILT TH-73
IPs Req'd	101		97		46			22	131	8	69						194	15	107		80	
Fully Burdened FHs per IP	178.2	87.2	178.4	103.8	40.2	32.0	8.5	71.9	85.0	27.5	73.2	78.7	77.6	73.1	52.6	71.7	78.0	27.7	131.7	40.5	122.6	40.8
IP FHs [4]	28,165		27,196		12,902			5,791	39,745	2,741	29,507						61,572	1,663	42,720		33,977	
Mth. IP FHs / Sorties	22	19	21	18	23	/	13	22 / 18	25	/ 16	36	/	17				25	/ 15	33	/ 19	26	/ 14
IP Avg. FHs an X (Planned)	2.61		2.64		2.03			1.80	2.12	2.29	2.38						2.10	2.30	2.20		2.10	
IP Xs per Day	39		37		23			12	62	4	29						92	6	49		38	
IP Avg Sortie Length	1.15	1.24	1.15	1.24	1.75	1.43	1.70	1.21	1.60		2.18	2.15	2.13	2.18	1.87	2.19	1.70		1.78	1.67	1.85	1.85

OPS

Wing	TW-1 [2]		TW-2 [2]		TW-6				TW-4							TW-5					
Phase	Adv Strike	E2C2	Adv Strike	E2C2	Primary T-6B	INT FTR T-6A	AMS T-6A	FTR T-45C	Primary T-6B	Hellcat T-6B	ME USN	ME USMC	ME USCG	E6	INT E2/C2	TILT T-44	Primary T-6B	Hellcat T-6B	Rotary TH-57	INT TILT TH-57	Rotary TH-73	INT TILT TH-73
FH Req: Annual [1]	33,136		31,995		12,902			5,791	39,797	2,894	29,507						62,000	1,721	43,681		35,111	
Daily Sortie Req: Day	142		137		55			25	169	12	126						264	7	186		149	
Daily Sortie Req: Scheduled	147		139		41			27	144		70						221		130		105	
Daily Sortie Req: Executed*	117		113		33			20	114		60						167		106		85	
SNA Avg. FHs an X (Planned)	2.00		1.99		1.92			1.72	2.03	2.38	2.21						1.89	2.39	2.10		2.05	
SNA Xs per Day	71		69		29			14	83	5	57						139	3	88		73	
SNA Avg Sortie Length	1.09	1.12	1.09	1.12	1.75	1.43	1.70	1.21	1.60		2.12	2.09	2.07	2.12	1.80	2.12	1.62		1.76	1.64	1.84	1.81
CNX: Maintenance	1.7%		4.3%		1.3%			2.8%	4.7%		6.6%						3.0%		4.9%			
CNX: Operation	6.8%		9.1%		8.5%			7.3%	6.6%		3.8%						8.6%		4.9%			
CNX: Weather	18.1%		9.8%		17.7%			11.7%	15.2%		7.1%						20.1%		12.3%			

[1] FHs IAW N3 FY24-32 NAVCOMPT "26Apr24 which includes all branches and Non-ATR, i.e. is a grand total of all FHs required.
[2] FY24 Mid-Year T-45 TW-1/2 Production FH increase requested. SNA OH overflown to plan due to unplanned TR4290, FCLP and CQ minimum landing requirements. Lagging indicator unknown 167C effect.
[3] RFP IAW FY24 Production Planning Factors and SNAs IAW FY24 SNA Production Requirement Memo dtd Dec23
[4] IP FHs do not contain SNA Solos or SNA Solo OH.
[5] TW-5 Primary IP requirement includes AMS + TPS
All FHs and Xs are a Planned flat FY average and do not reflect the monthly TW/TMS sine wave, see NIPDR and OPSUM charts and trends for monthly Planned to Execution.

15-Apr-24 CNATRA N32

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF REFERENCES

Air Force Personnel Center. (2022, March 1). PALACE Acquire Civilian Flight Instructor Internship Concept of Operations [Operational document]. U.S. Air Force.

Department of the Air Force. (2022, November 30). *PALACE Acquire Civilian Flight Instructor Intern (PAQ/CFII) Individual Development Plan (Rev. 8)*. Headquarters Air Force Personnel Center.

Department of the Air Force. (2023, July 11). *Bullet background paper on PALACE Acquire/Certified Flight Instructor Intern (PAQ/CFII) program status*. Headquarters Air Education and Training Command.

Becker, B. E., Huselid, M. A., & Ulrich, D. (2001). The HR scorecard: Linking people, strategy, and performance. Harvard Business Press.

Rand Corporation. (2022). Increasing fighter pilot retention with improved basing decisions. https://www.rand.org

Boardman, A. E., Greenberg, D. H., Vining, A. R., & Weimer, D. L. (2017). *Cost-benefit analysis: Concepts and practice* (4th ed.). Cambridge University Press.

Brophy, R., & Chomic, M. (2024, August). How to rebalance naval aviation training. U.S. Naval Institute Proceedings. Retrieved December 10, 2024, from https://www.usni.org/magazines/proceedings/2024/august/how-rebalance-naval-aviation-training

Chief of Naval Air Training. (2023). T-6B Primary Flight Instructor Training: CNATRAINST 1542.165C CH-1. Naval Air Training Command.

Chief of Naval Air Training. Student naval aviator training. Retrieved December 10, 2024, from https://www.cnatra.navy.mil/training-sna.asp

Department of the Navy. (2025, March). *Program Authorization 106: Officer Candidate School for Student Naval Aviators and Naval Flight Officers* (PA-106). https://www.netc.navy.mil/Portals/46/NSTC/OTCN/docs/OCS/PA-106_OCS_Pilot_and_NFO_Mar-2025.pdf

General Schedule. (2024). *Corpus Christi, Texas (TX) government salary rates*. https://www.generalschedule.org/localities/corpus-christi

General Schedule. (2024). *Milton, Florida (FL) government salary rates*. https://www.generalschedule.org/states/florida/milton-fl

Grant, B. C. (1988). Civilianizing the instructor force: The issue lingers (Report No. 88–1075). Air Command and Staff College, Air University. https://apps.dtic.mil/sti/tr/pdf/ADA194382.pdf

How much does it cost to become a pilot? Retrieved February 24, 2025, from https://pilotinstitute.com/cost-to-become-a-pilot/

Office of the Chief of Naval Operations. (2024, May 2). *Active component fiscal year 2024 aviation department head retention bonus* (NAVADMIN 092/24). Department of the Navy. https://www.mynavyhr.navy.mil/Portals/55/Messages/NAVADMIN/NAV2024/NAV24092.txt

Office of the Chief of Naval Operations. (2023, December 15). *2024 Navy officer manning plan* (OPNAV Notice 1301). Department of the Navy. https://www.secnav.navy.mil/doni/default.aspx

Office of Management and Budget. (1992, October 29). *Guidelines and discount rates for benefit-cost analysis of federal programs* (OMB Circular A-94). https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/circulars/A94/a094.pdf

Office of Personnel Management. (n.d.). *Aircraft operation series, 2181*. https://www.opm.gov/policy-data-oversight/classification-qualifications/general-schedule-qualification-standards/2100/aircraft-operation-series-2181/

Post Housing, Inc. (2025). NAS Corpus Christi, TX - 2025 BAH Rates. CorpusChristiNavalHousing.com. https://www.corpuschristinavalhousing.com/bah-rates

Post Housing, Inc. (2025). NAS Whiting Field, FL - 2025 BAH Rates. WhitingFieldHousing.com. https://www.whitingfieldhousing.com/bah-rates

Schultz, M. (2024, August). How to rebalance naval aviation training. U.S. Naval Institute Proceedings. https://www.usni.org/magazines/proceedings/2024/august/how-rebalance-naval-aviation-training

U.S. Army Europe & Africa. (2018, December). *Becoming a military dependent*. https://home.army.mil/stuttgart/index.php/download_file/view/496/746

U.S. Navy. (2021, October 8). T-6B Texan II turboprop trainer. Navy Fact Files. Retrieved December 10, 2024, from https://www.navy.mil/Resources/Fact-Files/Display-FactFiles/Article/2166435/t-6b-texan-ii-turboprop-trainer/

U.S. Navy. (2024). Navy pay and benefits. https://www.navy.com/careers-benefits/pay

Acquisition Research Program
Naval Postgraduate School
555 Dyer Road, Ingersoll Hall
Monterey, CA 93943

www.acquisitionresearch.net