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**ANALYSIS OF THE PERMANENT CHANGE OF  
STATION POLICY FOR THE U.S. NAVY SUPPLY  
CORPS COMMUNITY**

Galvao, Jose A.; Poe, Thomas T.

Monterey, CA; Naval Postgraduate School

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# NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

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MBA PROFESSIONAL PROJECT

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## ANALYSIS OF THE PERMANENT CHANGE OF STATION POLICY FOR THE U.S. NAVY SUPPLY CORPS COMMUNITY

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June 2018

**By: Thomas T. Poe  
Jose A. Galvao**

**Co-Advisor: William D. Hatch  
Co-Advisor: Simona L. Tick**

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**ANALYSIS OF THE PERMANENT CHANGE OF STATION POLICY FOR  
THE U.S. NAVY SUPPLY CORPS COMMUNITY**

Thomas T. Poe, Lieutenant Commander, United States Navy  
Jose A. Galvao, Lieutenant Commander, United States Navy

Submitted in partial fulfillment of the  
requirements for the degree of

**MASTER OF BUSINESS ADMINISTRATION**

from the

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June 2018**

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# **ANALYSIS OF THE PERMANENT CHANGE OF STATION POLICY FOR THE U.S. NAVY SUPPLY CORPS COMMUNITY**

## **ABSTRACT**

The Department of Defense is always examining opportunities to use its budget resources more efficiently while generating the right incentives to recruit, train and retain the best service members. Permanent Change of Station (PCS) funding requirements continue to increase at a rate that is significantly faster than the DoD budget allows. This has resulted in the Navy Personnel Command issuing letters of intent (NAVADMIN 159/17, 2017), allowing service members to start their PCS process before funding is granted and their orders are written. This study examines whether there are potential savings from implementing the option of two consecutive tours in the same CONUS geographical location. The study focuses on the Navy Supply Corps community, O1–O4, and uses a financial cost-benefit analysis (FCBA) to identify the relative strengths and weakness of a two-tour requirement in the same geographical location when compared to the status quo. Our findings show that there are positive net benefits for each individual set of PCS orders when facing a two-tour in the same CONUS geographical location. Our recommendation to Supply Corps Community senior leaders is to consider revising the PCS policy for their community with the goal of cost-saving and talent retention.



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## LIST OF ACRONYMS AND ABBREVIATIONS

AOR	Area of Responsibility
ATG	Afloat Training Group
AQD	Additional Qualification Designator
B2B	back to back
BAH	Basic Allowance for Housing
BAS	Basic Allowance for Subsistence
BQC	Basic Qualification Certification
BRS	blended retirement system
C5F	Commander Fifth Fleet
C6F	Commander Sixth Fleet
C7F	Commander Seventh Fleet
CBA	cost benefit analysis
CDR	Commander
CG	Guided Missile Cruisers
CONUS	continental United States
CVN	Aircraft Carrier, Nuclear
DAU	Defense Acquisition University
DAWIA	Defense Acquisition Workforce Improvement Act
DLA	Dislocation Allowance
DoD	Department of Defense
DoN	Department of the Navy
DDG	Guided Missile Destroyer
DEERS	Defense Enrollment Eligibility Reporting System
DLA	Defense Logistics Agency
ENL	enlisted
ENS	Ensign
FCBA	financial cost-benefit analysis
FDNF	Forward Deployed Naval forces
FLC	Fleet Logistics Center
FY	fiscal year



LCDR	Lieutenant Commander
LCS	Littoral Combat Ship
LT	Lieutenant
LTJG	Lieutenant Junior Grade
MALT	Monetary Allowance In lieu of Transportation
MILPERSMAN	Naval Military Personnel Manual
MSEP	Military Spouse Employment Partnership
NASO	Naval Aviation Supply Officer
NAVAIR	Naval Air Systems Command
NAVPERSCOM	Navy Personnel Command
NAVSUP FLC	Navy Supply Systems Command Fleet Logistics Center
NAVSUP HQ	Navy Supply Systems Command Head Quarters
NAVSUP WSS	Navy Supply Systems Command Weapon Systems Support
NPV	net present value
NSCS	Navy Supply Corps School
OMB	Office of Management and Budget
OPNAV	Office of the Chief of Naval Operations
PAL	Principal Assistant for Logistics
PAS	Principal Assistant for Services
PC	Patrol Craft
PCS	permanent change of station
RAND	Research and Development
SAFE	Stability of Activities in the Family Environment
SME	subject matter expert
SODHC	Supply Officer Department Head Course
SWSCO	Surface Warfare Supply Corps Officer
SYSCOM	Systems Command
TDY	temporary duty
TYCOM	Type Commander

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## I. INTRODUCTION

### A. BACKGROUND OF PERMANENT CHANGE OF STATION

A Permanent Change of Station (PCS) is a major consideration of every service member's career, and it is part of the professional development that allows the U.S. Navy to operate globally. According to Bond, Lewis, Pollak, Leonard, Guo, and Rostker (2016):

The Department of Defense (DoD) moves about one-third of its military service members each year (p. 1), and in fiscal year (FY) 2014 the total cost of the PCS program was \$4.4 billion (p. 3). Of that, \$1.5 billion went towards rotational moves (transoceanic moves to or from an overseas duty station) and \$1.3 billion went towards operational moves (moves within the continental United States [CONUS] or an operational theater).

In fiscal year 2015, the United States Navy spent \$328 million toward rotational moves and \$226 million toward operational moves (Military Personnel, *Navy Justification Book*, 2016, p. 6).

The PCS program allows the U.S. Navy to bring different ideas to new commands every couple of years as well as trains the naval service member to be well-rounded and able to function in different roles. The PCS program also helps service members meet career milestones that aid with their promotion goals. Per the MILPERSMAN (2015), service members PCS every two to three years. However, the considerable number of PCS moves throughout a service member's military career has substantial impacts on military members, their families, and the U.S. Navy as a whole. These frequent moves of service personnel can have an impact on the stability of the Navy within the same geographical area and can place stress on the command; each time service members face a PCS, they shift their focus to their next duty station and finding a place to live in a new area. From our experience, this has been the case at each command that we have been a part of, and we presume that this will be the case moving forward into the future. Moreover, the incoming service members joining the command must be trained on their new job, set up their arrival of household goods, and often enroll their children into new schools, which may have an impact on the readiness of the command.

A recent document (NAVADMIN 159/17, 2017) shows that the DoD is spending \$4.4 billion on PCS orders and it is currently operating in the red, with the promise that there will be funding in the future (Chief of Naval Operations, 2017). Are there any potential cost savings from two consecutive tours in the same CONUS geographical location?

In this research we will conduct a financial cost-benefit analysis to examine the costs and cost savings generated by the alternative PCS policy of allowing service members in the same geographical location for back-to-back tours. This alternative PCS policy might not only contribute to saving money to the DoD, but it might also act as a non-monetary incentive to retain highly talented, qualified officers who might face work-life balance constraints. In this study we will focus on the Navy Supply Corps community with the goal of building a proof of concept that may be applied to other naval communities.

## **B. RESEARCH QUESTIONS**

In this study we will address the following research questions:

1. Can the Navy save in Permanent Change of Station costs for Supply Officers, O1-O4, by implementing a two-tour option in the same CONUS, geographical location for their first 15 years of service?
2. What are the main impacts, tangible and intangible, that should be considered in deciding whether a two-tour option in the same CONUS location is a cost-saving alternative to the status quo?

### **1. Identification of Products Resulting from the Project**

This MBA project will develop a decision-support financial cost-benefit model that will be adjustable to include any updates in the assumptions or data estimations used in the model. The model developed in this study will provide insight and decision support regarding the current Naval Supply Corps Officer, O1–O4 PCS policy and the relative strengths and weakness of the alternative PCS policy of staying in the same geographical location for two tours when compared with the status quo.

## **2. Identification of the Expected Content of the MBA Professional Report that will Result from the Project**

This study will provide decision-support to the Chief of Supply Corps on how we currently detail, against the proposed two-tour minimum requirement in the same CONUS geographical location for the service member's first 15 years of Naval Service. Specifically, the project findings will provide insight into whether the alternative PCS policy can allow the Supply Corps community to operate more efficiently and with improved morale for the Supply Corps Officer and their families. The financial data identified in this report was collected from several sources, including previous studies, and available Navy statistics. However, some of the impacts were monetized using assumptions and our best knowledge, and a small portion of our research was unable to be quantified. These limitations are inherent to conducting financial cost-benefit analyses, and our study is no different in this regard.

### **C. ORGANIZATION OF PROJECT REPORT**

This study is organized into the following chapters. Chapter II will describe the institutional background around the Supply Corps community within the United States Navy. We will present their mission, vision, and guiding principles, and the role the PCS plays for the Supply Corps community. Additionally, we will present the literature review on previous studies that examined PCS'ing. Chapter III will present the financial cost-benefit analysis methodology we used in this study, and it will detail the analysis steps and current PCS forecasting models along with financial data. Chapter IV will describe our sensitivity analysis and will present the results from the cost-benefit analysis. Chapter V will present summary and conclusions, and will propose any potential topics for future examination to continue this extensive line of inquiry. This analysis will also yield recommendations for a careful look at a revised PCS policy.

### **D. SUMMARY**

This research project will examine the current PCS process and will make an attempt to monetize the net costs or cost savings that might result from reduced PCS moves within the Supply Corps Officers community. The purpose of the study is to build

a proof of concept that can be later adjusted and applied to other officer communities. The findings of this study will bring insights that may allow the Navy Supply Corps community to, internally, better regulate PCS moves within their community. According to the NAVSUP headquarters mission statement (2018), this will enable them “to provide supplies, services, and quality-of-life support to the Navy and Joint warfighter” (NAVSUP HQ, 2018). Finally, this research allows us to look at the PCS process as a whole and the opportunity to identify any potential cost savings. While we continually operate in a fiscal environment where funding is limited, we, as military leaders, need to be ready to revamp this outdated process if we expect to remain as a joint global force.

## **II. BACKGROUND AND LITERATURE REVIEW**

### **A. THE SUPPLY CORPS COMMUNITY**

The Naval Institute Archives states that “the organization known today as the Navy Supply Corps was originally founded in 1795, as the U. S. Navy Office of Purveyor of Supplies” (*Naval Institute Archives*, 2012). This year, 2018, the Navy Supply Corps will have been serving the United States Navy honorably for 223 years. Currently, there are 2,213 Supply Corps Officers and approximately 23,000 enlisted personnel that serve our country every day (Navy Personnel Command, 2018b). Of those 2,213 Supply Corps Officers we are going to look at the Ensigns (O-1) through Lieutenant Commanders (O-4), which is approximately 1,717 Officers.

The Supply Corps community has developed its long-standing reputation as being a global logistics force that can support any warfighter on any continent. As these officers continue to learn and get fully qualified at their current duty station, they will need to rotate to a new billet and learn a different line of operation. These traits of getting qualified and then PCSing continue to be instilled in every facet of training to these officers, as well as to be included in their mission statement, vision, roles, guiding principles, and even their motto. The reason these statements or traditions are important is because they make the officer more susceptible to change when PCSing and instill learning at each duty station. All these traits have been outlined in some form by the Supply Corps community in numbers one through five, with the sixth bullet being our Supply Corps oakleaf, which is known as the Supply Corps’ legacy.

#### **1. SUPPLY CORPS MISSION**

The mission of the Navy Supply Corps is “to deliver sustained global logistics capabilities to the Navy and Joint Warfighter” (NAVSUP, 2018).

#### **2. SUPPLY CORPS VISION**

The Navy Supply Corps’ vision as described by NAVSUP (2008) headquarters, is “To produce autonomous, resourceful military logisticians with broad skills who deliver



operational logistics, supply chain management, and acquisition and business capabilities to provide mission readiness.”

### **3. NAVAL SUPPLY SYSTEMS COMMAND GUIDING PRINCIPLES**

There are four guiding principles that the Naval Supply Systems Command uses that are listed below that have been retrieved from the NAVSUP website (NAVSUP, 2018).

We relentlessly pursue customer satisfaction

We are tenacious, agile, flexible, and responsible in supporting the warfighter

We foster an environment of innovation, initiative, and mutual trust and respect

We value individual integrity, courage, and accountability.

### **4. ROLES OF SUPPLY CORPS OFFICERS**

The roles of a Supply Corps Officer are to execute the duties relating to general supply functions, logistics, combat support, material readiness, fuel management, contracting, financial management, disbursement, and food service. Supply Corps Officers have served on nearly every platform of ship in the United States Navy, except a patrol craft (PC).

### **5. SUPPLY CORPS MOTTO**

According to the Supply Corps community (2018), the official motto of the Supply Corps is “‘Ready for Sea’ – Reflecting the Supply Corps’ longstanding role in sustaining warfighting” (Navy Supply Corps [United States], 2018). The official logo was pulled from the NAVSUP website and is illustrated in Figure 1.



Figure 1. Supply Corps Officer “Ready for Sea.” Source: NAVSUP (2018).

## 6. OAK LEAF

The Supply Corps Officer wears a staff corps insignia on the left side of their uniform collar, which is represented by a gold oak leaf. The oak leaf is made up of three gold oak leaves with three acorns, two of which are at the stem and one in between the upper leaves. The Supply Corps oak leaf image was found on the Navy Supply Corps foundation website and is illustrated in Figure 2 (Navy Supply Corps Foundation, 2018).



Figure 2. Supply Corps Oak Leaf. Source: Navy Supply Corps Foundation (2018).

## B. SUPPLY CORPS PATH

A PCS move is an important aspect to the progression of a Supply Corps Officer's career. With each move to a new duty station, officers bring knowledge gained at the prior assignment and share what they have learned with their new peers. As such, not only is a PCS move beneficial for individual growth, but also vital to the Navy as a whole. The career paths and timelines for Navy Supply Corps Officers are laid out for them in a yearly brief from NAVPERSCOM (Navy Personnel Command, 2018a), as shown in Figure 3. As displayed, there are certain timeframes for each rank to allow officers time at each duty station to gain as much in-depth training needed to strengthen their repertoire before they are to be rotated to a different duty station.

SUPPLY CORPS CAREER PROGRESSION CHART				
RANK	YEAR	TOUR	POSSIBLE TOURS	MARKET BASKET MILESTONES
FLAG	31+	FLAG TOURS	COCOM J4, TRANSCOM J5, JOINT STAFF J4, OSCR, DSCC, NEXCOM, WSS, NAVSUP, GLS, OPNAV N41	
	30			
	29			
	28			
	27			
CAPT	26	Shore: CONUS, OCONUS, JOINT (If not JSO)	FLC, NAVSUP, COMCOMs, Policy Development, Program Office	JQO Designation, APM, Competition, Policy, Program Level, Command, TVST
	25	Shore: CONUS, OCONUS, JOINT (If not JSO)	WSS, NAVSUP, DLA HQ, JCS WASH, COMCOMs, DLA ICPs, Command, Joint Staff	Competition, TVST, Executive Education, JQO Designation, Policy, Program Level, Command
	24			
	23			
	22			
CDR	21	Shore: CONUS, OCONUS, JOINT O-5 Operational Tour	Large Sup Afloat, COCOMs, Joint Staff, JCS Wash, OPNAV, DLA, Overseas shore, LOGSU	Competition, 2nd Warfare Qualification, Policy, O-5 Sea, TVST
	20	Shore: CONUS, OCONUS, JOINT	Tours in Sup Chain, Acq, OPLOG, JOINT STAFF, STAFF, COCOMs, JOINT Tours, Overseas Shore (if not been)	JQO Designation, APM, Competition, IA, TVST JPME II
	19			
	18			
	17			
16	Shore: CONUS, OCONUS, JOINT 3rd Operational Tour	ASUPPO/PAL/PAS Large Afloat, STAFF, COCOMs, Overseas Afloat, FLC, CENTCOM, CTF, Overseas Shore (if not been)	2nd Warfare Qualification, Competition, Operational Platform Diversity, IA, TVST	
LCDR	15	Shore: CONUS, OCONUS, JOINT	Tours in Sup Chain, Acq, OPLOG, STAFF, Subspecialty Assignment, SYSCOM, COCOMs, JTF J4 Staff, DLA, NATO HQ, FLC, WSS	Overseas, Joint Experience, DAWIA LVL III, IA, Payback Tour, TVST, Competition
	14			
	13			
	12			
	11	PG School	NPS or Civilian Institution Alternative	Masters Degree, JPME I, Subspecialty Assignment
LT	10	2nd Operational Tour	Supply Afloat (Dept Head) or other Operational Tour	2nd Oper tour, 2nd Warfare Qual, Geographic Diversity, Platform Diversity
	9			
	8			
	7			
	6			
LTJG	5	Shore: CONUS, OCONUS, Internship, Joint Command	Subspecialty Development/Internships (NACO, BFM, ILS, IT, OPLOG)	Subspecialty Assignment, DAWIA LVL II, IA
	4			
	3			
ENS	2	1st Operational Tour	Supply Afloat or other Operational Tour	1st Operational Tour, Warfare Qual, Competition
	1			
	0			

Figure 3. Ensign to Admiral Roadmap. Source: Navy Personnel Command (2018).

There is only one major promotion board that will take place for a Supply Corps Officer in the first 15 to 16 years of military service. This promotion board takes place for Lieutenants around the 10-year mark, and if selected the next promotion board will be five to six years later. There is only one requirement for these Lieutenants, which is to have completed two operational tours or currently be serving on his or her second operational tour before the board meets for Lieutenant Commander. The reason this promotion is so important is because it will take the Supply Corps Officer to his or her next promotion board that will be around year 15 or 16, in which the Officer will have to start moving and not be able to stay in the same geographic location for two consecutive tours.

Before we look at each individual rank and discuss their duties, responsibilities, and milestones, we must first mention the prescribed sea and shore rotation from the Military Personnel Manual (MILPERSMAN). The prescribed Supply Corps tour lengths in Figure 4 are updated as of 3 March 2015 and can be found in the MILPERSMAN 1301–110 (MILPERSMAN, 2015).

#### 4.10 Supply Corps Officer (310X) Tour Lengths

Rank	Tour Type	Job Description	Sea Tour	Shore Tour	Remarks
(3165)		New accession designator	24-30		
ENS/ LTJG	Initial Sea	Training	24-30		Sea tour follows assignment to submarines after completion of Supply Corps school and submarine school.
	First Shore	Functional		24-36	Newport BCQ - 6 months, CONUS or overseas.
LT	Second Sea	DH, large deck readiness or services	24-30		Independent duty afloat, large platform.
	Second Shore	Advanced education		12-24	PG school, JPME.
		Functional		24-36	Supply support or policy.
		Advanced education		12-24	PG school, JPME.
Functional		24-36	Supply support or policy.		
LCDR	Third Sea	Primary assistant DH	24		Large platform assistant, independent duty afloat.
	Third Shore	Functional utilization		24-36	CONUS or overseas, PG school payback.

Figure 4. Minimum Prescribed Sea and Shore Tour Lengths. Source: MILPERSMAN (2015).

### 1. ENSIGN

Upon completion of a commissioning source, Ensigns will report to the Navy Supply Corps School (NSCS) for their Basic Qualification Course (BQC). After graduating from the BQC, they have their first opportunity to serve as a Supply Corps officer in an operational tour and have the opportunity to acquire one or more of their warfare qualifications. Most Ensigns will acquire the Surface Warfare Supply Corps Officer (SWSCO) pin on his or her division officer tour. There are two operational tours that are offered to them. The first being a Department Head billet on a submarine or a mine sweeper, and the second being a Division Officer billet on a Guided Missile Destroyer (DDG), Littoral Combat Ship (LCS), Aircraft Carrier, Nuclear (CVN), Guided Missile Cruiser (CG), Landing Helicopter Dock Ship (LHD), Landing Helicopter Assault Ship (LHA), or Dock Landing Ship (LSD). These billets are currently 24 to 30 months in length. There are other one-year assignments for Ensigns who are not fit for sea duty at

the time or have other circumstances that will be sent to an Air Station, Fleet Logistics Center (FLC), or a Type Commander (TYCOM) billet (Navy Personnel Command, 2018a). Once the officer has completed two years of commissioned service they will be promoted to Lieutenant Junior Grade (LTJG), or also known as an O-2.

## **2. LIEUTENANT JUNIOR GRADE**

After completing his or her first operational tour, Supply Corps Officers will typically head to a shore billet. These billets can be overseas, a FLC, TYCOM, internship, flag aide and numerous other shore duty assignments. This allows these officers to develop a principle line of operation, earn a subspecialty, or an additional qualification designator (AQD), or both. These billets are currently 30 to 36 months in length (Navy Personnel Command, 2018a). Once the officer has completed two additional years from making LTJG, they will be promoted while on their first shore duty to Lieutenant (LT), which is an O-3.

## **3. LIEUTENANT**

Once the officer completes his or her shore duty they will head back to Newport, Rhode Island, for Department Head School at NSCS. Supply Officer Department Head Course (SODHC) are for the officers that are going back to a ship to be a department head and the other Lieutenants that are going to their second operational tours wont specifically require this schooling. It is highly recommended that Lieutenants do his or her second operational tour so that they will be eligible for promotion. A typical Department Head tour is approximately 30 months in length. Figure 5 was taken from the NAVPERSCOM monthly newsletter and illustrates how important it is to complete your second operational tour before screening for Lieutenant Commander (LCDR) (Navy Personnel Command, 2018b). A Lieutenant will typically screen for LCDR at his or her 10-year mark, which means that he or she will have approximately six years from the time they make LT before screening for their LCDR board.

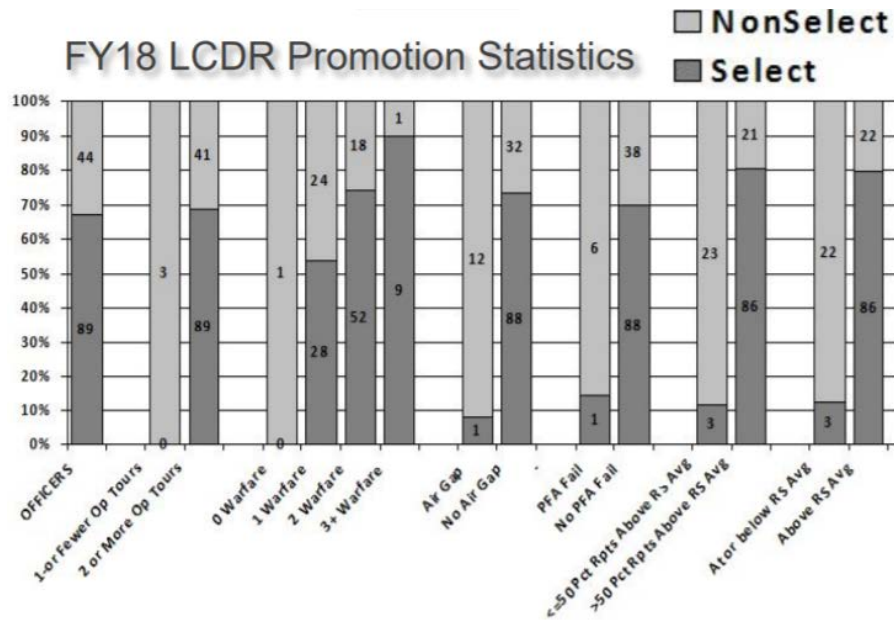


Figure 5. Recent Promotion Statistics to LCDR. Source: Navy Personnel Command (2018b).

After completing a department head tour or a second operational tour, Lieutenants will typically head to a postgraduate school for continued education. There are several options when determining where y would like to go. The first is Naval Postgraduate School that offers students the opportunity to get a subspecialty code in Supply Chain Management (1302), Contract Management (1306), Financial Management (3110), as well as attaining your Joint Professional Military Education (JPME) Phase I. The Navy also selects Lieutenants to go to civilian institutions in the 810 or 811 programs. The 811 program is at the University of Kansas and is a Petroleum Management (1307) degree. The 810 program is one of the Business Week Top 30 schools in the nation. A service member that gets selected to this program will have their pick as to where they would like to attend graduate school based on their preferences and depending on which school selects them. The Air Force and Marine Corps Junior Service colleges, and Naval War Colleges offer a Master of Strategic Studies and as well as JPME Phase I. The final school that we will mention is the Army Command and General Staff College that offers only a JPME Phase I, and the master’s degree is optional (Navy Personnel Command, 2018a).

Once the officer is in route, attending, or departing from his or her graduate studies they will be promoted to Lieutenant Commander, which is an O-4.

#### **4. LIEUTENANT COMMANDER**

The Supply Corps officer has numerous options after completing their post graduate level education from one of the many options offered by the Navy or civilian institution. The first option is to go back to sea and serve as the Assistant Supply Officer on an LHD/LHA or serve as the Principal Assistant for Logistics (PAL) or Principal Assistant for Services (PAS) on a CVN. This also provides the opportunity to earn an additional warfare qualification, the Naval Aviation Supply Officer (NASO) and the BC8 AQD. These typical afloat tours are approximately 24 months in length.

The other option is to take on a tough visible shore tour such as, Navy Supply Systems Command Head Quarters (NAVSUP HQ), Office of the Chief of Naval Operations (OPNAV), Fleet Staff, TYCOM, Systems Command (SYSCOM), NAVSUP Weapon Systems Support (NAVSUP WSS), FLC, the Joint or Defense Logistics Agency (DLA), equivalents, in order to gain experience in a line of operation (Navy Personnel Command, 2018a). The benefits associated with this option give the officer a Supply Corps lines of operation and competition amongst their peers. After 18 months on the job, they will have their subspecialty code upgraded from a P code (navy funded graduate degree) to an S code, which is 18 months of experience. These typical shore tours are approximately 24 to 36 months in length.

#### **C. TOUR LOCATIONS AND LENGTHS**

The United States Navy has bases all over America with ships located in multiple areas to include Norfolk, VA; San Diego, CA; Mayport, FL; Everett and Kitsap-Bremerton, WA; Groton, CT; Kings Bay, GA; and Honolulu, HI. All these locations that have ships stationed at them also have supporting commands such as DLA, Navy Supply Systems Command, Fleet Logistic Centers (NAVSUP FLC), TYCOM, Afloat Training Group (ATG) and multiple other commands that support the fleets with logistics, sustainment, and guidance from the shore. These commands will help the ships get ready for deployment, ensure that they are inspection ready, and will also help with guidance in



any way they can. These supporting commands are a great follow on tour for junior Supply Corps Officers. They offer greater responsibility and allow the officer to develop a supporting role to the warfighter in the fleet. Moreover, by staying in the same geographical location as their first operational command, the service member will not have to move their homes, families, vehicles, and all their household goods across the country or even across the world.

## **1. BILLET AVAILABILITY**

The next set of figures in this section was formulated from data that was acquired from NAVPERSCOM. The data that was acquired was a list of every billet that is available for all officers, O-1 to O-4 in the Supply Corps community. The billets were then broken down to four specific locations: Bremerton and Everett, WA; Jacksonville and Mayport, FL; the greater Norfolk, VA; area and the greater San Diego, CA, area. There were multiple billets in the vicinity of each of these locations, but we put a maximum of a 60-mile radius from each of the locations and then deleted the outliers. These locations and the availability of billets at these locations will be used in determining whether a Supply Corps Officer can advance in their career while having the opportunity to stay in the same location for two consecutive tours.

### ***a. Bremerton and Everett, Washington, Area***

The first geographic region to be discussed is the Bremerton and Everett, Washington, area shown in Figure 6. There were only seven Ensign billets and nine Lieutenant Junior Grade billets that made up 10 and 13 percent of the billets, respectively. This means that after an officer's initial sea tour (in that they will arrive as an ENS and leave as a LTJG) there will be 39 billets available for a Lieutenant to remain in the same geographical location, which is over four times more billets for he or her to choose from. This cannot be said for the LT to LCDR billets, in which the numbers of billet go down from 39 to 14 LCDR billets. This geographical area would be easy for an Officer at the O-1 to O-3 level, but then their billets at O-4 would be cut by over half. This is typically the case in every area since there are substantially less LCDR's (471)

than there are LT's (762) in the Supply Corps community, per the latest *Office of Personnel Monthly newsletter* (Navy Personnel Command, 2018b).

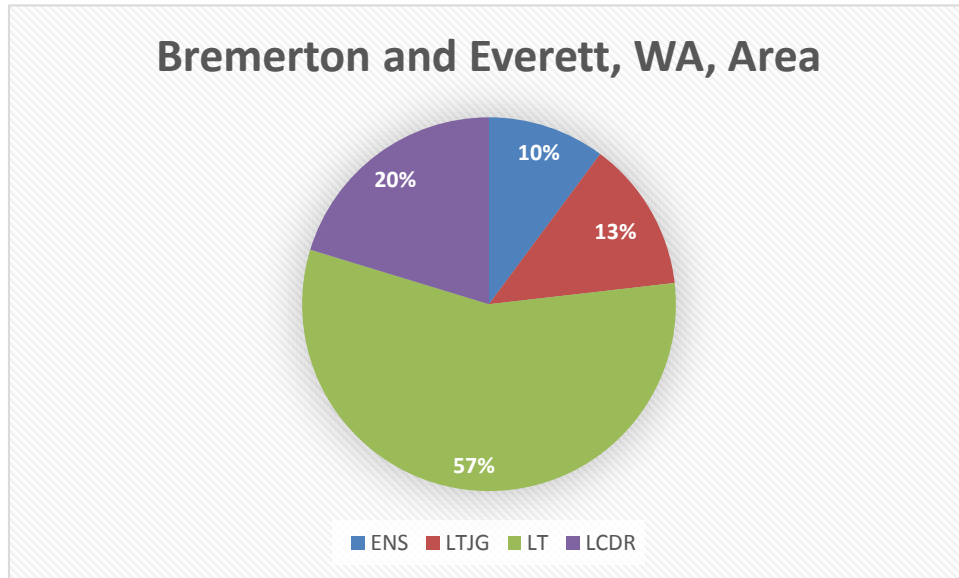


Figure 6. Billet Availability by Paygrade for Bremerton and Everett, WA. Source: House (2018).

***b. Jacksonville and Mayport, Florida, Area***

The second geographic region is the Jacksonville and Mayport, Florida, area graph shown in Figure 7. There were the same numbers of billets for Ensign's and Lieutenant Junior Grade's that made up over one third of the total billets in this location. This means that of those 20 billets for the O-1 and O-2's in that location there will be 28 billets available for a Lieutenant to stay in the same geographical location, which is more than twice the number of billets for him or her to choose from. This is less than half of the numbers that were examined in the Bremerton and Everett locations for Lieutenants. Finally, the number of LCDR billets available in this region is only 12, yet it makes up 20 percent of the billets for a Supply Corps Officer in this geographical location.

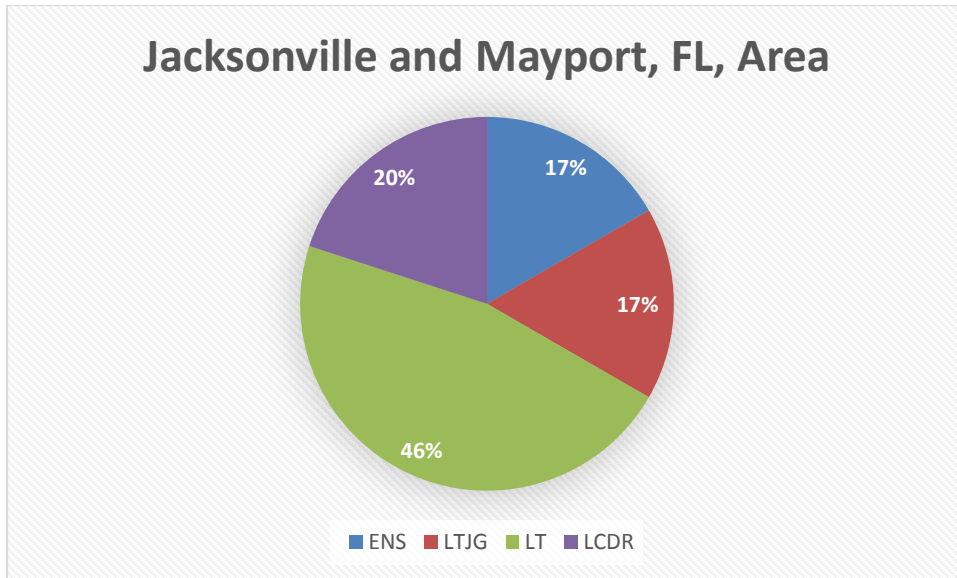


Figure 7. Billet Availability by Paygrade for Jacksonville and Mayport, FL. Source: House (2018).

*c. Norfolk, Virginia, Area*

The third geographic location examined is the Norfolk, Virginia, area shown in Figure 8. The number of billets for Ensign and Lieutenant Junior Grades were 55 and 61 billets, respectively. These numbers are five to six times larger than the first two locations that we looked at and will be comparative to the San Diego area since they have the most amount of ships in these locations. These two ranks made up just over 30 percent of the total billets in the greater Norfolk area for the Supply Corps billets. Moreover, with there being 171 Lieutenant billets available for a junior Supply Officer to take, it means that there are more than enough billets for a division officer completing their first operational tour to accept a follow-on shore billet in this location as their follow-on tour in the same geographical location. Once again, we see that there is roughly half the amount of LCDR billets, 87, which makes up the other 23 percent of the total billets in this location. As stated earlier, there is just over half the amount of LCDR's as there are LT's, which makes these numbers true to the total amount of Officers we have in the inventory.

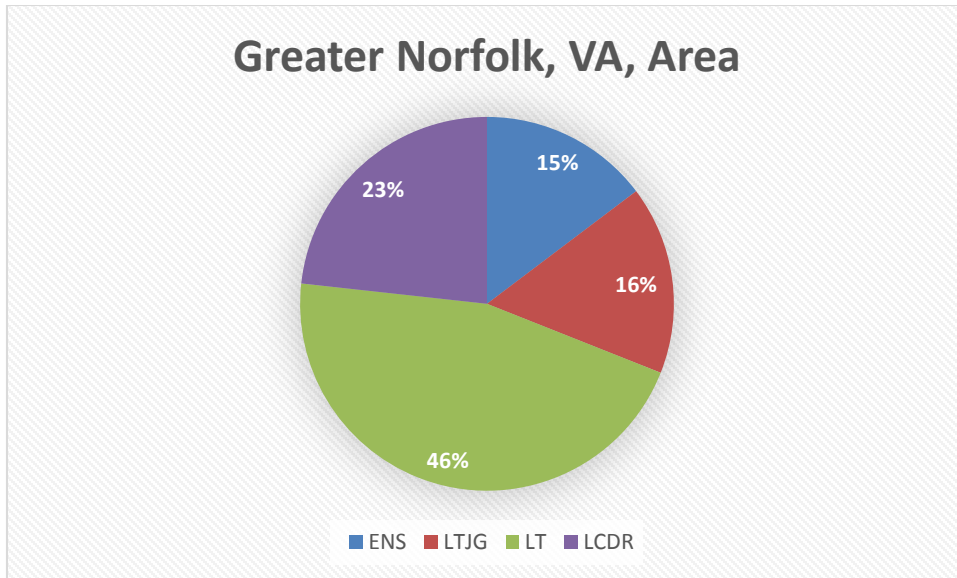


Figure 8. Billet Availability by Paygrade for Norfolk, VA. Source: House (2018)

*d. San Diego, California, Area*

The fourth geographic location examined is the San Diego, California, area shown in Figure 9. The number of billets for Ensign and Lieutenant Junior Grades were 36 and 53 billets, respectively. These numbers are very comparative to the Norfolk area that we discussed above, due to the amount of ships in these two locations. These two ranks made up 34 percent of the total billets in the greater San Diego area for Supply Officers in this location. There are currently 126 billets for Lieutenants in San Diego and 52 billets for Lieutenant Commanders. As we discussed above about Norfolk, there are enough billets for these ENS's and LTJG's to take follow on orders in San Diego after their first initial sea tour. This can also be said about the LCDR's looking for billets after their third operational tour in San Diego and are looking for a shore duty billet as their second consecutive tour in this location.

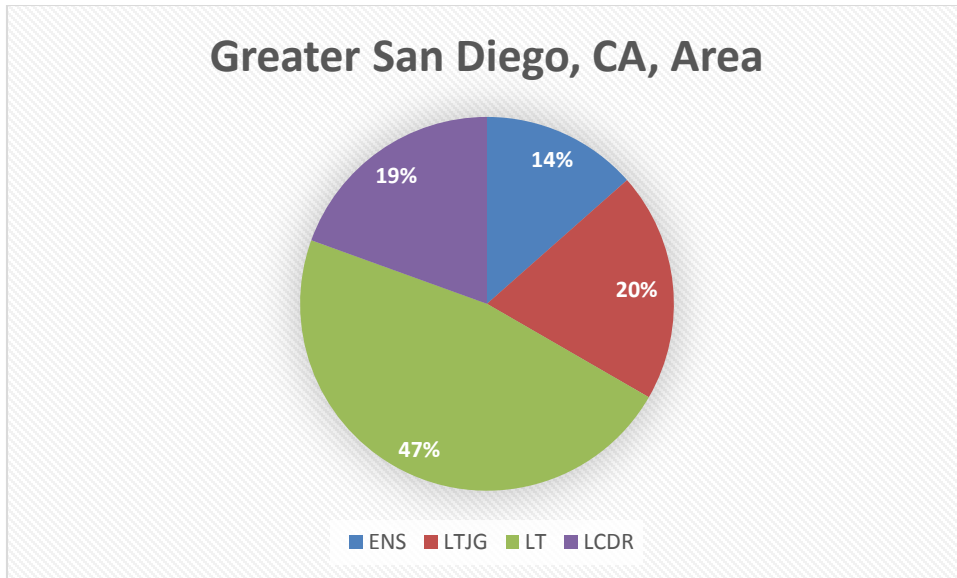


Figure 9. Billet Availability by Paygrade for San Diego, CA. Source: House (2018)

#### D. LITERATURE REVIEW

##### 1. **RAND Corporation: *The Effects of Military Change of Station Moves on Spousal Earnings* (WR-1170-OSD)**

The 2016 RAND National Defense Research Institute study titled “*The Effects of Military Change of Station Moves on Spousal Earnings*” by Burke and Miller addresses the impacts on military spouse’s employment earnings after executing a permanent change of station move. This study follows 4.6 million people over a 12-year period, from 2001 to 2012. The estimated effect of PCSing on spousal earnings from the 2016 study will be used in our FCBA. Therefore, in reviewing the Burke and Miller (2016) study we focus on discussing the spouse’s sample demographics, their earnings, the average amount of PCS moves per year, and the negative \$4,226.35 estimate, in Figure 13, that will be used throughout the rest of this project for costs and cost savings monetization to the service member.

The goal of the Burke and Miller (2016) study is to evaluate the differences in what the service member’s spouse earns at their next duty station in the specific year they executed their PCS move. The data on annual earnings of both the service member and their spouse was extracted from Social Security records and military records. “The annual

earnings reported to Social Security includes all sources subject to social security taxes, which includes self-employment earnings” (Burke & Miller, 2016, p. 11).

The Burke and Miller (2016) study data sample captures the average age, service, pay grade, race, and college education on 4.6 million people over a 12-year period, as it is shown in Figure 10 (Burke & Miller, 2016). In their analysis sample, the average spouse of a service member, is, on average, 30 years old, with 72 percent being female spouses who are Caucasian, and with roughly one-third of them having some college education.

Variable	MEAN	STD
<b>Spouse Characteristics:</b>		
Age Spouse	30.31	8.195
% Spouse Female	0.93	0.247
<b>Family Characteristics:</b>		
% Children under 6	0.42	0.493
# Children under 6	0.57	0.772
% Children 6 - 18	0.41	0.492
# Children 6 - 18	0.74	1.058
% Children 0 - 18	0.67	0.472
# Children 0 - 18	1.31	1.230
<b>Servicemember Characteristics:</b>		
Age	30.75	7.766
Service: Army	0.37	0.483
Service: Navy	0.25	0.431
Service: Air Force	0.26	0.438
Service: Marines	0.12	0.331
Pay Grade: Enlisted	0.78	0.415
Pay Grade: Officer	0.21	0.405
AFQT Percentile	0.62	0.204
AFQT Missing	0.25	0.435
Race White	0.72	0.448
Some college or more	0.33	0.470
<b>Location Characteristics:</b>		
Metropolitan	0.84	0.363
Unemployment	0.06	0.023
N	4,612,558	

Figure 10. Sample Demographic Characteristics. Source: Burke & Miller (2016).

<b>Variable</b>	<b>MEAN</b>	<b>STD</b>
Spouse Earnings	\$15,301.19	23,678.08
% Spouse Earnings > 0	0.67	0.47
Spouse Earnings if > 0	\$22,811.52	25,778.20
% Spouse Earnings > \$1,000	0.63	0.48
Servicemember SSA Earnings	\$43,452.69	24,446.20
Servicemember Total Pay	\$55,366.62	31,867.83
N	4,612,558	

Note: Earnings data have been adjusted for inflation and indexed to 2013 dollars.

Figure 11. Sample Earning Characteristics. Source: Burke & Miller (2016).

The average amount of spousal earnings is \$15,301, as shown in Figure 11 (Burke & Miller, 2016). The average \$15,000 per year comes from the total population of spouses, which includes roughly 33 percent of spouses that were not employed. If the spouse is currently working, the average annual earning is nearly \$23,000 per year, whereas the service members annual total pay, with benefits, is approximately \$55,000. The service member in this case is making more than double, on average, than their spouse, making the spouse more imprudent on giving up their career and moving with the service member every two to three years.

The Burke and Miller (2016) study found that, on average, 26 percent of all service members (and accompanying spouses) will be moving in any given year, as shown in Figure 12. These numbers will be used in our sensitivity analysis to determine, on average, how many Supply Corps officers move each year. By taking the total number of officers in our FCBA and calculating the percentage of military PCS's each year. We will be able to calculate the benefits for the military service member and the United States Navy.

Variable	MEAN	STD
% PCS Moves in Year	0.26	0.438
# PCS Moves in Year	0.29	0.520
% Interstate Moves in Year	0.23	0.421
# Interstate Moves in Year	0.25	0.484
N	4,612,558	

Figure 12. PCS Moves Incidence. Source: Burke and Miller (2016).

Using multivariate regression analysis, the Burke and Miller (2016) study estimated an average loss for a service member's spouse's earnings due to a PCS move at \$4,226.35, as shown in Figure 13. In our FCBA, we will use an annual average spouse's earnings loss of \$4,200, which is \$4,525.20 in 2018 dollars.

VARIABLES	Spousal Earnings	Spousal Earnings	Spousal Earnings	Spousal Earnings	Spousal Earnings	Spousal Earnings
PCS Move in Yr	-3,716.21 (25.10)	-3,685.62 (24.24)		-2,129.23 (14.70)	-2,057.90 (14.59)	-2,068.50 (14.59)
PCS Moves in Yr (Interstate)			-4,226.35 (25.01)			
Spouse Age				338.19 (12.63)	772.46 (16.66)	
Member Age				679.68 (14.26)	778.26 (14.46)	
Member Total Pay				-0.03 (0.00)	-0.02 (0.00)	
Member SSA Pay				-0.04 (0.00)	-0.04 (0.00)	
Paygrade Enlisted				1,713.1 (73.89)	1,692.6 (76.44)	
# Child < 6 yrs				-3,175.19 (13.25)	-3,238.97 (13.34)	
# Child 6 - 18 yrs				-1,190.35 (14.87)	-1,288.74 (15.09)	
Unemployment End Location				-51.70 (6.85)	-55.39 (6.85)	
End Location Not Metropolitan				-676.57 (26.39)	-686.46 (26.37)	
Spouse Female X Age					-334.60 (9.13)	
AFQT Percentile X Age					-1.66 (0.10)	
AFQT Missing X Age					-286.22 (8.47)	
Constant	16,264 (12.77)	18,313 (38.94)	18,281 (38.81)			
Includes Year Fixed Effects?	No	Yes	Yes	Yes	Yes	Yes
Includes Spouse Fixed Effects?	No	No	No	Yes	Yes	Yes
Observations	4,612,558	4,612,558	4,612,558	4,612,558	4,612,558	4,612,558

Note: All point estimates are significant at the 1% level. Standard errors, clustered at the spouse level, are in parentheses. Earnings data have been adjusted for inflation and indexed to 2013 dollars. Spouses with zero earnings are included in the sample.

Figure 13. Impact of PCS Moves on Spouse Earnings. Source: Burke and Miller (2016).



**2. RAND Corporation: *Tour Lengths, Permanent Changes of Station, and Alternatives for Savings and Improved Stability* (RR-1034)**

The second study that we used as a data source in our analysis is also conducted by RAND in 2016, titled “*Tour Lengths, Permanent Changes of Station, and Alternatives for Savings and Improved Stability*” and authored by Bond, Lewis Leonard, Pollak, Guo, & Rostker. “A request was made by the Senate Authorization Committee to have the DoD review the current PCS policy” (Bond et al., 2016, p. XI). There is continuous pressure on each military service branch to reduce PCS costs in an attempt to sustain budgetary limits (Bond et al., 2016, p.3). The research concentrated initially on all types of PCS moves, “but as the study progressed it became obvious that the research should focus on alternatives both for rotational moves (i.e., to and from overseas) and for operational moves (those within a geographic area)” (Bond et al., 2016, p.11). One of the simpler alternatives mentioned was to extend the current tour lengths. There are clearly some advantages and disadvantages associated with this alternative. An advantage with this alternative allows the DoD to reduce PCS moves. According to Bond, Lewis, Leonard, Pollak, Guo, & Rostker (2016), “Longer average tour lengths can reduce the number and cost of PCS moves and increase mission continuity and readiness by reducing turnover and keeping personnel in their jobs longer once they are trained” (Bond et al., 2016, p. 5).

The study included records on 1.34 million active duty service members ranging from all service branches, up to the rank of O-6. Over a three-month period, a survey was conducted in order to determine how each service member felt regarding PCS alternatives to the current PCS policy. This research examined the current PCS policy and provided data in supporting a few alternatives on how the DoD can help reduce PCS costs. We will discuss these results relating to family stability and the path to becoming a geographical resident expert, as this relates closest to our analysis. We will be using their data to assess a monetary value for family stability, in the amount of \$3,600 (FY \$2018) for each year a family remained in the same geographical location. We were unable to monetize for someone that was labeled as a geographical resident expert, nor the benefits to the Navy for keeping someone in the same area because of that title.

The method used in their research was that of multivariate statistical analyses. One of the options analyzed it included a bonus, as a percentage of the service members base pay, to incentivize sailors to stay in the same geographical location for additional time on station. The alternative to the PCS status quo that we will examine is related to this option in that it assesses impacts from longer tours. This methodology used in the Bond et al. (2016) study uses a ‘one for one’ concept, meaning that every officer leaving a command will have another officer coming in to relieve him or her. This results in the execution of two PCS moves in order to relieve one billet within the Supply Corps community. This methodology relates to our FCBA the best when analyzing the current PCS policy in comparison with the back-to-back tours in the same location alternative. As the Bond et al. (2016) research illustrates, there is room for improvement in managing PCSing while still executing the Supply Corps Mission.

The findings specifically show that 10,000 service members, (about 60% of the respondents) would not voluntarily extend for an additional 12 months beyond their tour length without some financial or other incentives (Bond et al., 2016). A few important factors that influenced a service member’s decision were the “job itself, special pays and allowances, the quality of living conditions, and the stability of children” (Bond et al., 2016). Furthermore, about 41% of the sample study participants stated they would extend (primarily in OCONUS tours), if a lucrative compensation is presented. The applicants were willing to receive compensation in monetary or non-monetary terms.

The results in the Bond et al. (2016) study show that in order to reduce the total cost for PCS moves the DoD must reduce the total number of service members it PCS’s each year or reduce the cost of each PCS year. To reduce the average costs per each PCS year can be achieved by simply reducing the overall force. Yet, reducing the overall force it would have an adverse impact on the officer communities and enlisted inventories. Alternatively, the DoD can increase the amount of time between each PCS move (i.e., back to back (B2B) tours in the same geographical location). This method would be easier to implement because it does not consider the size of the DoD when calculating the overall PCS cost. Extending tour lengths might help reduce the overall PCS costs, but it can have an impact on the overall health of that service branch. The extension allows for

a service member to obtain significant experience in becoming a geographical resident expert. Important to our study, the Bond et al. (2016) study survey findings show that service members value family stability and that quality of family life as a key factor when it comes to making a decision to PCS. They also show that financial compensation had little to no influence for the service members in regards to staying in the same geographical location by extending their current tour. Service members valued family stability in this scenario over financial compensation when the opportunity to PCS presented itself. In our FCBA we will be referencing these two findings when identifying the main impacts from PCS'ing.

### **III. FINANCIAL COST BENEFIT ANALYSIS FOR PCSING IN THE SUPPLY CORPS COMMUNITY**

A cost benefit analysis is an important analytical tool in determining if a set of alternatives can be beneficial in replacing or altering the status quo. A CBA is a decision-support tool that provides a careful examination of comparative strengths and weaknesses of the studied alternatives. The analyst conducting the CBA strives to quantify as best as possible the net benefits from each alternative and to provide a recommendation. Typically, an economic cost benefit analysis includes the dollar estimates of costs and benefits to all stakeholders involved. Given the time available for this study, we take a restricted approach by conducting a financial cost benefit analysis, from the point of view of a Navy Supply Corps officer and the Navy Supply Corps community. In this chapter we present the steps, methodology, assumptions, and data we used in our financial cost benefit analysis on back-to-back tours in the same geographical CONUS location versus the status quo, which requires PCSing every two to three years.

#### **A. COST-BENEFIT ANALYSIS METHODOLOGY**

The cost benefit analysis in this report follows the CBA steps described in the book titled *Cost-Benefit Analysis, Concepts and Practice* (Boardman, Greenberg, Vining, & Weimer, 2011), and illustrated in Figure 14. The first two steps in a CBA identify which courses of action you want to analyze and then decide who will have standing. Standing refers to the stakeholders who are impacted by the change in policy. Steps three and four identify all the impacts (negative and positive) to all stakeholders with standing, and then predict how the impacts might change over the entirety of the project. Then, all the impacts will be monetized in step five. Once the impacts (costs and benefits) are monetized, they will need to be discounted to present value. Next, the present value of costs of the project will be subtracted from the present value of benefits to determine the net benefit of the policy alternatives. Lastly, a sensitivity analysis will be conducted to examine how the assumptions and estimates impact the net benefits of the alternatives examined. Based on findings, a recommendation for the best course of action is

formulated. The Boardman et al. (2011) is a great reference on the specifics of each CBA step.

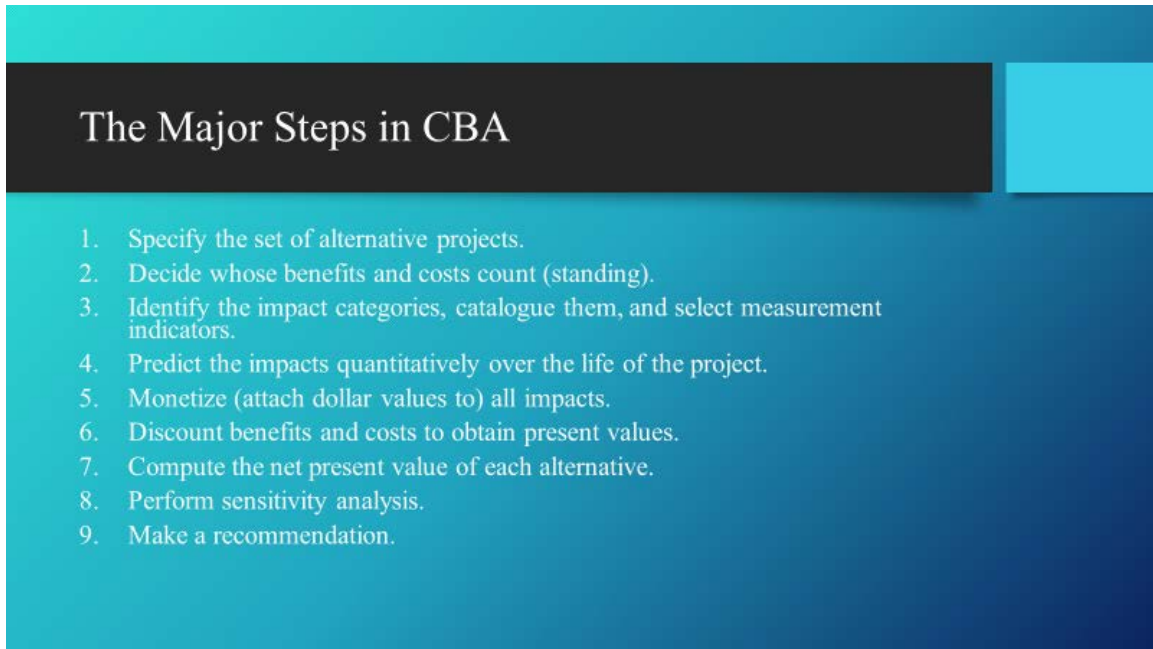


Figure 14. How to Conduct a Cost-Benefit Analysis. Source: Boardman, et al. (2011).

The other reference we use to frame our analysis is the *Office of Management and Budget (OMB) Circular No. A-94*, “Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs.” The *Circular No. A-94* “applies to any analysis used to support Government decisions to initiate, renew, or expand programs or projects which would result in a series of measurable benefits or costs extending for three or more years into the future” (Office of Management and Budget, 2017, p. 3). The OMB document provides guidance on how to conduct a CBA for any policy or project that uses tax payer resources. This reference provides support for the methodology, details how to identify and measure benefits and costs, and explicitly guide the choice of discount rates. It guides the analyst to quantify the net benefit of a project over a specific timeframe. Thus, this reference can be used as a benchmark to assist in the critical decision-making process of a CBA.

## **B. COST-BENEFIT ANALYSIS STEPS AND RESULTS**

### **1. Specify the Set of Alternative Projects**

Step number one in a CBA is to identify a set of alternatives for the project that you are about to conduct. The first alternative is to do nothing and maintain the status quo. The current status quo for a Navy Supply Corps Officer is to have a permanent change of station every 24 to 36 months depending on the rank of the officer and the accessibility of the incoming officer that is replacing them (MILPERSMAN, 2015). For instance, when an Ensign is assigned to their first ship or operational billet, they will get 24-month orders, pending how many Ensigns will be completing their BQC class. If the projected amount will not fill all the billets, after that 24-month time frame, the officer can get 30 to 36-month orders instead. As for a LCDR, their billets are generally all 36 months unless they are heading to an operational billet, which would only be 24 months, or an independent overseas billet, which would be just 12 months.

The second alternative for this project would be a proposed policy change that would require all LCDR's and below to have the opportunity to stay in the same geographical location for back to back CONUS tours. If the officer chooses to go to a new location, that will be up to both the detailer and the service member, and therefore would not hurt or impede their career progression. Officers staying in the same geographical location (homesteading), that are taking challenging and highly visible tours should have the same opportunity for promotion as the officers who consistently PCS. Back-to-back tours may save the government PCS money and may generate monetary and non-monetary costs savings to the officer and the officer's community, as it will be discussed in further detail later in this chapter.

### **2. Decide Whose Benefits and Costs Count (Standing)**

According to Trumbull (1990), "The term *standing*, in the context of cost-benefit analysis, was coined by Dale Whittington and Duncan MacRae (1986) to distinguish those whose preferences are to be counted. If someone's preferences are counted, then that person has standing" (Trumbull, 1990, p. 201). The stakeholders whose impacts are

to be counted in our analysis are Navy Supply Corps Officers, and the Supply Corps community.

In our opinion, an O-1 to O-4 works directly with their detailer and their preferences have the most direct impact to their careers and personal life. In our financial cost benefit analysis, we give standing to the U.S. Navy (Supply Corps community) and to the Supply Corps officers in the ranks of O-4 and below. The senior Supply Corps officers will be affected due to the inability to hand select junior officers to their commands, forcing them to accept whomever is in the inventory in their geographic location.

### **3. Identify the Impact Categories, Catalogue Them, and Select Measurement Indicators**

Boardman et al. (2011) suggests including only direct impacts (and no secondary impacts) in a CBA. The impacts (benefits and costs) considered in this FCBA are shown in Tables 1 and 2, for the current PCS policy and the proposed PCS policy. There were several other impacts that were considered in our analysis; however, we deemed them less important and ultimately did not monetize them as we could not find data or did not have enough time to monetize them. The first such impact that we decided to remove from our list was the cost to the Navy for not conducting PCS moves at all. A second impact that was left out of our analysis was the cost of a service members children's education because we consider it a sunk cost, thus, with no bearing to the CBA. The other impacts that we did not consider in our analysis are listed in our suggestion for future research, in the next chapter.

Table 1. Benefits and Costs to the Supply Corps Officer and the Navy, from Current PCS Policy

Benefits	Costs
Officer relocation to a new command for additional professional expertise <ul style="list-style-type: none"> <li>• Officer and Navy perspective</li> </ul>	Sunk costs: Packing/Unpacking time <ul style="list-style-type: none"> <li>• Officer perspective</li> </ul>
Cultural exposure with diverse demographics <ul style="list-style-type: none"> <li>• Officer and Navy perspective</li> </ul>	Family instability: Quality of Life <ul style="list-style-type: none"> <li>• Officer perspective</li> </ul>
Expanding corporate knowledge <ul style="list-style-type: none"> <li>• Officer and Navy perspective</li> </ul>	Inconvenience: Hotels, Rental Equipment U-Haul, Food, Gas, Clothing, etc. <ul style="list-style-type: none"> <li>• Officer perspective</li> </ul>
Achieving career milestones <ul style="list-style-type: none"> <li>• Officer perspective</li> </ul>	Spouse unemployment/ Job relocation <ul style="list-style-type: none"> <li>• Officer perspective</li> </ul>
Training in route to new duty station <ul style="list-style-type: none"> <li>• Officer and Navy perspective</li> </ul>	New primary care manager provider <ul style="list-style-type: none"> <li>• Officer perspective</li> </ul>



Table 2. Incremental Benefits and Costs for the Supply Corps Officer and the Navy, from Alternative PCS Policy

Benefits	Costs
<p>Eliminates time and resource expenditure <i>(PCS costs, housing, spouse employment, children education, etc.)</i></p> <ul style="list-style-type: none"> <li>• Officer and Navy perspective</li> </ul>	<p>Unable to network throughout the entire Supply community</p> <ul style="list-style-type: none"> <li>• Officer perspective</li> </ul>
<p>Geographical resident expert</p> <ul style="list-style-type: none"> <li>• Navy perspective</li> </ul>	<p>Potential for complacency</p> <ul style="list-style-type: none"> <li>• Navy perspective</li> </ul>
<p>Reduce the amount of PCS moves throughout a naval career</p> <ul style="list-style-type: none"> <li>• Officer and Navy perspective</li> </ul>	<p>Missing career milestones <i>(Not achieving Acquisition certification, promotion)</i></p> <ul style="list-style-type: none"> <li>• Officer perspective</li> </ul>
<p>Professional work reputation</p> <ul style="list-style-type: none"> <li>• Officer perspective</li> </ul>	
<p>Achieving career milestones <i>(Earning Acquisition certification, and promotion)</i></p> <ul style="list-style-type: none"> <li>• Officer perspective</li> </ul>	
<p>Stability and Quality of Life</p> <ul style="list-style-type: none"> <li>• Officer perspective</li> </ul>	
<p>Spousal employment</p> <ul style="list-style-type: none"> <li>• Officer perspective</li> </ul>	
<p>More encouraged to buy a home versus rent</p> <ul style="list-style-type: none"> <li>• Officer perspective</li> </ul>	

*a. Benefits*

(1) Eliminates time and resource expenditure in relocation efforts

There are many variables that go into a successful PCS move, beyond the costs of direct costs for PCSing faced by the Navy. Primarily, sailors will start searching for housing several months in advance before they are scheduled to rotate. The options are endless and typically sailors will have their own prioritized requirements list. Depending on the location, some sailors may prefer a shorter daily commute over the size of their housing arrangements. Also, service members with children will strongly consider schools that have a better educational foundation with higher schooling ratings. For sailors that are married, their spouse will begin to research future employment at the next duty station as soon as they know where they are going. In some instances, this can be a much more difficult transition for industries like healthcare, real estate management, and legal.

These research efforts come at a significant cost to the sailor, their family members, and their current command. Our assumptions suggest that these research relocation efforts will take place predominantly at the sailor's current workplace, resulting in hours of conducting research rather than dedicating their time to their job. This can decrease work output performance, impacting the command, and the officer. Moreover, research relocation efforts performed collectively by the family will take place late in the evening hours and the weekends. We assume that each officer will allocate, at a minimum, 20 hours a week towards relocation effort for a PCS move to a new geographical location.

(2) Geographical resident expert

A benefit with remaining in the same geographical location is that an officer becomes a resident expert. For example, this label can be applied to all the different areas of operation (AOR) (e.g., C6F, C5F, C7F, etc.) and especially to Navy concentrated areas such as Norfolk, San Diego, Bremerton, etc. Each AOR operates and functions slightly differently from one another. Whenever a new officer checks into a new command, there is usually a learning curve in the beginning of their tour. Initially, the officer is

processing command information, reading related instructions and references and making important contacts at each of the supporting commands. For example, when reporting to a new command, a service member may lean and count on the most seasoned officer at their command. This comes from a direct result from the seasoned officer being on the tail end of the tour and the possibility that they have spent the last four to six years in the same geographical location.

(3) Reduce the amount of PCS moves throughout a naval career

An officer can have influence on the amount of times they PCS throughout their naval career. When it comes time to PCS, there are many factors to consider when moving to a different geographical location and determining if executing a PCS is warranted. Important factors like family, where the service member is at in their career, and financial status will affect this decision. On average, an officer may move as many as eight times before reaching the rank of Commander. This alternative allows an officer to still achieve the rank of commander, while reducing the amount of moves by almost half.

(4) Professional work reputation

A professional reputation is a key attribute that all successful officers possess. An article from business study notes defines professional reputation as “a general opinion about someone of the employees in the business organization is judged through professional reputation” (Jadoon, 2017). It takes time to develop a strong professional reputation, even in a smaller organization like the Supply Corps community. Building a professional reputation is a slow and methodical process and can be achieved through multiple methods. The working relationships that an officer builds with their superior’s forms over time. From our experience, it is simpler to establish your professional reputation within the community once the service member has proven to be an asset to their command and their community. In the short run, this can be accomplished by assuming extra duties within your command. These duties could be a section leader, prospective gain coordinator, command duty officer, etc. Building your professional reputation within the Supply Corps community can be accomplished by volunteering for

a position within your local Supply Corps chapter or volunteer your time in support of local events like the Supply Corps ball, golf event, charities, or gala's.

(5) Achieving career milestones

Through the ranks between ENS and LCDR, the Supply Corps community has outlined what they value as critical milestones to achieve the next rank. They vary from rank to rank and there are several paths that an officer can accomplish these goals. According to the latest *Supply Corps road show slides (2018)*, there is no perfect path to success (Navy Personnel Command, 2018a). Promotion to LCDR requires an officer to obtain a warfare qualification and complete two operational tours (sea, expeditionary, or both). Community leaders strongly encourage afloat or expeditionary department head tours to remain competitive amongst their peer group. Additionally, it is highly recommended that a service member has a master's degree to be promoted to Commander (CDR), have significant expertise in at least one Supply Corps competency, and completed a tough visible tour (Navy Personnel Command, 2018a).

An officer can still reach their career milestones by remaining in the same geographical location for two consecutive tours. Based on the Supply Corp billet inventory, there is huge opportunity for an officer to successfully accomplish these critical milestones while remaining competitive amongst their peers. Hypothetically, an officer can remain in the same geographical location for the first nine years of the naval career and promote without any consequences.

(6) Spousal employment

PCS moves affect the officer's spouse the ability to promote within the corporate ladder and affect annual earnings as compared to their civilian counterparts within the same industry. These frequent moves present a unique challenge for a spouse's career. Like military service member, a spouse has developed a professional reputation with their management and in their career field. This human capital will be lessened due to the frequent moves conducted over a military members career. Spouses that are in professional career fields that require licenses or state certifications could have

difficulties recertifying and getting hired at their new duty station because of it being a different state.

The RAND studies research “found that military spouses have lower earnings and employment than people with the same age, sex and education who are married to civilians, and that having experienced more military moves in the past is associated with lower spousal earnings” (Burke & Miller, 2016, p. vi). This case study tracked just over 4.6 million military spouses over a 12-year period spanning from 2001 to 2012. By comparing the Social Security earning records with military records, earning data was collected to compare the pre and post PCS moves. The results clearly show that each PCS move has a negative effect on the service members spousal earning income in the first 12 months of their move, on the average of just over \$2,000, or one eighth of their earnings (Burke & Miller, 2016). A potential for ZERO earnings will increase during the year of the PCS move as well. Last of all, a PCS moves has the largest negative impact especially when a PCS crosses state lines.

(7) More encouraged to buy a home versus rent

The frequency of PCS moves strongly influence whether officers buy or rent a home at their new duty location. When a service member knows that he or she is guaranteed to remain in the same geographical location for the next four to six years, it can influence the officer in purchasing a home rather than renting. As business insider reports, “There’s no denying that homeownership is one of the most coveted goals of homeowners in the U.S.” (Elms & 360 Mortgage Group, 2012, p. 1). Home ownership will give the officer some advantages both in the near and long term. In the near term, they have the option for resale after a new set of orders to a different location. In the current housing market, the return on investment can be moderate depending on location. Additionally, the officer avoids paying any capital gain taxes if they encounter both the ownership test, which is if they own the home for a minimum of 24 months out of the last 60 months up to the date of sale, and the use test is if they used the home as a primary residence for the same amount of time. The *IRS Publication 523, Selling Your Home* indicates “taxpayers are eligible for the exclusion if they have owned and used their home

as their main home for a period aggregating at least two years out of the five years prior to its date of sale” (Internal Revenue Service, 2018, p. 16). In the long term, the other option is to rent out the home and use it as a rental property. Owning a rental property in a military town can make it easier to find tenants that have qualified employment, stable income and sign a longer-term lease.

***b. Costs***

(1) Unable to network throughout the entire Supply Corps community

Much of the Supply Corps functions and outings are designed to give a junior Supply Corps Officer the ability to socialize and look for mentorship from more senior officers. These functions include “All Calls” with the Chief of the Supply Corps, RADM Jonathan Yuen, annual Supply Corps birthday parties, sporting events, OP roadshows, golf outings, luncheons, and annual charity auctions, to name a few. A cost to the officer for staying in the same geographical location for back to back tours would be that they would not be able to socialize and gain mentorship from other, more senior Supply Officers in different areas. They would only get the opportunity to gain mentorship from the officers currently stationed in that area, or the few that would be rotating every three years as the current status-quo would have it. By not having this opportunity of gaining diverse mentorship and possibly one of the officers sitting on a future board of the junior officer, they could possibly get passed up for promotion or not get selected to one of the many unique opportunities that are offered to junior officers. This would be one of the biggest costs that is discussed when looking at the new policy and its implementation.

(2) Potential for complacency

The drawback for remaining in the same geographical location may cause the officer to become complacent within their specific location. The officer can be comfortable in their natural setting and wish to remain in “their” operational box. This can result in minimizing potential growth in an officer’s professional development.

(3) Missing career milestones

If not properly managed by the officer, even in a heavily concentrated area, the limiting billet opportunities have the potential to slow down or prevent the officer from meeting critical milestones to achieve the next rank. For their follow-on tour, an officer should look for a billet that offers experience in a more senior position with a greater level of responsibility. There could be a shortage of quality tours that meet these conditions for a more senior follow-on tour in the same geographical location. When the officer is scheduled to rotate, timing can also play a huge part in the officer landing a quality follow-on tour.

The Defense Acquisition University (DAU) is recognized for their excellence and expertise in government acquisition. Through the Defense Acquisition Workforce Improvement Act (DAWIA), DAU offers Supply Corps officers the opportunity to earn certifications at three levels ranging from: entry level (Level I), experienced (Level II), and a technical expert (Level III) in numerous Supply Corps lines of operations. These certifications are obtained from the officer's work experiences and then certifying with their DAU classes. This can only be accomplished by taking specific acquisition coded billets offered in various locations. Even in heavily concentrated areas like Norfolk, VA, and San Diego, CA, it can become difficult to obtain the next certification level due to the limited acquisition billets offered in these two locations. In some cases, the officer will have to move to places like NAVSUP HQ, OPNAV or NAVAIR to become certified as a Level III in their perspective line of operation.

**4. Predict the Impacts Quantitatively over the Life of the Project**

In step number four the analyst will quantify the impacts for each alternative over the life of a project. The timeframes can range adversely depending on the scope of the complexity of the project. Also, there may be some impacts that an analyst will be unable to quantify due to numerous reasons. Some of these reasons may be unquantifiable benefits, not enough historical data on a specific impact, or because there is a new piece of technology. Another impact that we had to consider was the new blended retirement system (BRS). As the DoD moves away from the old retirement system and implements

the BRS, there is going to be major impacts to the all-voluntary force when they do not get their fifty percent retirement after serving 20 years. Finally, the analyst must take into consideration all the alternatives based on their estimates for each course of action.

In our opinion, the revised PCS policy can positively impact the Supply Corps community, but most importantly the individual Supply Corps officer. The revised PCS policy benefits and costs will be evaluated using a cost-effectiveness analysis model. According to the *OMB* (1992), “Cost-effectiveness analysis is appropriate whenever it is unnecessary or impractical to consider the dollar value of the benefits provided by the alternatives under consideration” (Office of Management and Budget, 1992, p. 5).

For example, the U.S. Navy is already taking a proactive approach at lengthening tour assignments for enlisted sailors stationed in the Navy’s Forward Deployed Naval Forces (FDNF) in Japan. Vice Admiral Burke stated that when “a service member gets to Japan there is a 12 to 18-month learning curve and they will only get to do their job proficiently for a short period before it’s time for them to move again” (Hlavac, 2018). These shorter tour lengths result in a high turnover rate that have a negative effect on the ship’s ability to maintain maximum operational readiness.

Receiving PCS orders can be both exciting and stressful. Knowing that your next duty station will be in the same geographical location as your current duty station can help relieve some undue stress. This will eliminate the dreadful task of moving. Moving is recognized as one of the Top 5 most Stressful Situations an individual will endure (Health Status, 2009).

These research efforts come at a significant cost to both the sailor and family member and his or her command. In my opinion, these research relocation efforts will take place majority at the officer’s current workplace resulting in hours conducting research rather than dedicated to work. This can decrease work output performance, impacting the command as well as the officer.



## 5. Monetize (Attach Dollar Values) to all Impacts

In step number five we attached dollar values to all the costs and benefits identified from step three. All the impacts that are used in our analysis need to be in the same unit. Table 3 is a breakdown of all the estimated proposal benefits and costs that were monetized and inflated to 2018 dollars. First, we will look at the proposal benefits from the officer perspective and try and be as transparent as possible.

Table 3. Permanent Change of Station CBA (FY \$2018)

<b>Proposal Benefits</b>	<b>Officer Perspective</b>	<b>NAVY Perspective</b>
Eliminates time in relocation efforts	\$ 1,725.00	\$ 4,285,632.00
Not looking for Housing at new duty station	\$ 2,807.72	\$ 1,253,422.36
Spousal income	\$ 4,525.20	-
Geographical resident expert	-	\$ 431,569.56
Achieving career milestones	\$ 625.20	-
Stability and Quality of Life	\$ 3,600.00	-
Buy a home versus rent	\$ 6,753.82	\$ -
<b>Total Benefits</b>	<b>\$ 20,036.94</b>	<b>\$ 5,970,623.92</b>
<b>Proposal Costs</b>	<b>Officer Perspective</b>	<b>NAVY Perspective</b>
Unable to network throughout the entire Supply community and missing career	\$ 625.20	-
Potential for complacency	-	\$ 1,186,447.00
<b>Total Costs</b>	<b>\$ 625.20</b>	<b>\$ 1,186,447.00</b>
<b>Net Benefits</b>	<b>\$ 19,411.74</b>	<b>\$ 4,784,176.92</b>

The first amount of \$1,725 is the non-reimbursable cost that a service member spends each time that they PCS, which is every two to three years (Ewing, 2018). Thus, staying in the same geographical location for back to back tours will eliminate this non-reimbursable cost for the naval officer. The second amount of \$2,807.54 is the cost that will be saved by the service member for not looking for housing at their next duty station. The amount has been calculated from the base pay of an O-3 with over eight years of service, which is \$6,083.40 per month and \$73,000.80 annually. We used an O-3 with over eight years of service as our base since that is directly in the middle of our 15-year analysis of a naval officer. Then, the \$73,000.80 was divided by 52 weeks that are in a year, which came out to \$1,403.86 per week. We also assumed that on average a military member works a 40-hour week. Next, we presumed that a service member spends

approximately 20-hours a week (or \$701.93 per week) searching for a home at their next duty station and that they will do this for an entire four weeks, which comes to \$2,807.72.

The third benefit that will be expanded on in the officer's perspective is the amount of money that will be gained from, or rather not lost from a spouse losing earnings during their PCS move. The RAND study that we looked at suggested that on average the amount was approximately \$4,200 in fiscal year 2013 dollars (Burke & Miller, 2016), in which we inflated to 2018 dollars using the Joint Inflation Calculator (January 2018) that was at an inflation rate of 1.0774 and equated to \$4,525.20. The fourth benefit that we looked at was the officer being a geographical resident expert, which has no monetary value to the officer except that it helps them in completing day to day tasks associated with their job. For the Navy perspective there will be several opportunity costs that will be discussed in the next few paragraphs. The fifth benefit that is monetized is the dollar amount for achieving career milestones. This amount was generated by taking the difference from an O-4 (\$7,052.70) base pay over 10 years and subtracting an O-3 (\$6,271.20) pay over 10 years to get an amount of \$781.50, which would be the amount they get when they promote to LCDR each month. The \$781.50 was then multiplied by 12 to get an annual difference of \$9,378, in which we then divided it over the 15-year career that we are looking at in that it comes out to a \$625.20 benefit for the naval officer. The next benefit that we looked at and monetized was that of the family stability and quality of life for a service member and their family over a one-year period. Research studies have been conducted in how to value a family's stability. Factors such as a parental divorce, a change in the household composition and family moves have a strong influence in contributing to the family's (in)stability. As stated by Israel, Roderick, and Ivanova (2001), "Stability of the family environment is often cited as an important influence on the psychological development of infants, children, and adolescents" (Israel, Roderick, & Ivanova, 2001, p. 417).

This case study examined how the participants evaluated routine interior and exterior family functions. The report supported the reliability of the structure of SAFE. Furthermore, according to Israel, et al. (2001) it is suggested that the results of the factor analyses and findings that different aspects of family stability demonstrated different

patterns of relationships to indices of family functioning and are consistent with the presumption guiding the development of the SAFE that families achieve stability in diverse ways (Israel et al., 2002). This research study strongly suggests that family stability may contribute to optimal development in a child's youth.

Of the three factors listed above, an officer can reduce the number of times their family moves, especially throughout their military career. Putting a quantitative value on family stability can be difficult, but it is achievable. There are many options to consider when calculating this benefit due to the nature of each specific family for what and how they prioritize their family activities. Ultimately, we have assessed a value of \$3,600 for each family for every year their family remained in the same place. This value includes certain favorite family activities that also include weekend activities, ability for the child to remain with their school friends throughout the school years, help reduce problematic behaviors and their academic progress as well as their social competence. Lastly, Sandstrom and Huerta (2016) state that "school mobility has the strongest effect during early elementary and high school, with multiple school transfers leading to worse effects" (Sandstrom & Huerta, 2016, p. 7).

Another benefit that we looked at was professional reputation. There was no data that we could find that showed a monetary value that would benefit the officer or the Navy. This means that they can take it into consideration, but there is no monetary value assigned to this benefit.

The next benefit that we looked at was the basic allowance for housing for officers in the four locations in the United States with the most billets for a Supply Corps Officer. The following set of data comes from the Defense Travel Management Office website and has been put together in an excel spreadsheet that details the four different pay increases for O-1 to O-4's that we will be using for our research. The first table is the basic allowance for housing in the Everett, Washington, area. The reason we picked this location over Bremerton, Washington, is that because the Everett BAH rates were higher than the rest of the locations in this specific area. The information is shown in Table 4.

Table 4. Monthly BAH Allowance for Everett, WA. Source: Defense Travel Management Office, (2018).

<b>EVERETT WA MONTHLY ALLOWANCE:</b>	
<b>O 1 with DEPENDENTS:</b>	<b>O 1 without DEPENDENTS:</b>
\$2,121.00	\$1,908.00
<b>O 2 with DEPENDENTS:</b>	<b>O 2 without DEPENDENTS:</b>
\$2,229.00	\$2,073.00
<b>O 3 with DEPENDENTS:</b>	<b>O 3 without DEPENDENTS:</b>
\$2,451.00	\$2,181.00
<b>O 4 with DEPENDENTS:</b>	<b>O 4 without DEPENDENTS:</b>
\$2,691.00	\$2,310.00

The next set of data is from the Jacksonville, Florida, area. These BAH rates are significantly less than Everett and the San Diego rates but are comparable to the Norfolk allowances. The basic-allowance-for-housing rates are non-taxable income to the Navy sailor and their spouses that is a huge part of their income. We will discuss in our cost-benefit analysis how these rates influence Naval Officers to choose a specific duty location and whether he or she will purchase a home in this location or just rent a house or apartment. Table 5 is the data that was populated from the Defense Travel Management Office website and shows the Jacksonville, Florida, allowance for housing rates.

Table 5. Monthly BAH Allowance for Jacksonville, FL. Source: Defense Travel Management Office, (2018).

<b>JACKSONVILLE FL MONTHLY ALLOWANCE:</b>	
<b>O 1 with DEPENDENTS:</b>	<b>O 1 without DEPENDENTS:</b>
\$1,500.00	\$1,314.00
<b>O 2 with DEPENDENTS:</b>	<b>O 2 without DEPENDENTS:</b>
\$1,662.00	\$1,449.00
<b>O 3 with DEPENDENTS:</b>	<b>O 3 without DEPENDENTS:</b>
\$1,692.00	\$1,593.00
<b>O 4 with DEPENDENTS:</b>	<b>O 4 without DEPENDENTS:</b>
\$1,860.00	\$1,665.00

The third set of data is the basic allowance for housing rates in the Norfolk, Virginia, area and is shown in Table 6. This table will also be discussed in our cost-benefit analysis chapter and will most likely be used in our sensitivity analysis since it has the most amount of ships in this location and has the most number of billets for junior officers to do their second tour in the same geographical location here in Norfolk, VA.

Table 6. Monthly BAH Allowance for Norfolk, VA. Source: Defense Travel Management Office, (2018).

<b>NORFOLK VA MONTHLY ALLOWANCE:</b>	
<b>O 1 with DEPENDENTS:</b>	<b>O 1 without DEPENDENTS:</b>
\$1,536.00	\$1,509.00
<b>O 2 with DEPENDENTS:</b>	<b>O 2 without DEPENDENTS:</b>
\$1,656.00	\$1,530.00
<b>O 3 with DEPENDENTS:</b>	<b>O 3 without DEPENDENTS:</b>
\$1,932.00	\$1,605.00
<b>O 4 with DEPENDENTS:</b>	<b>O 4 without DEPENDENTS:</b>
\$2,325.00	\$1,761.00

The final set of Data is from the San Diego, California, area and will be the second most useful location since it has the second most number of billets for junior officers, behind Norfolk. The data that was collected and populated in excel from the Defense Travel Management Office is shown in Table 7.

Table 7. Monthly BAH Allowance for San Diego, CA. Source: Defense Travel Management Office, (2018).

<b>SAN DIEGO CA MONTHLY ALLOWANCE:</b>	
<b>O 1 with DEPENDENTS:</b>	<b>O 1 without DEPENDENTS:</b>
\$2,589.00	\$2,355.00
<b>O 2 with DEPENDENTS:</b>	<b>O 2 without DEPENDENTS:</b>
\$3,012.00	\$2,505.00
<b>O 3 with DEPENDENTS:</b>	<b>O 3 without DEPENDENTS:</b>
\$3,150.00	\$2,841.00
<b>O 4 with DEPENDENTS:</b>	<b>O 4 without DEPENDENTS:</b>
\$3,417.00	\$3,063.00

The final benefit that we monetized was the equity in buying a home versus renting over a five-year period. We calculated that the average BAH rates from the four locations that we observed for an O-3 without dependents equaled \$2,055. The reason we observed an O-3 is because after your initial tour from Basic Qualification course in Newport, RI, the officer will be an O-2 and will be promoting to O-3 within the next year. Most of the time an officer will not buy a home at their first duty location because they are unsure of where they will be living and if they even want to stay in the military over their four-year commitment. We then used a mortgage calculator to determine that a \$300,000 home with a four percent interest rate would give them a monthly payment of \$1,432. Once they add home owner’s insurance, property taxes, escrow, and all your utilities to the \$1,432 they will be very close to the \$2,055 average BAH rate. Additionally, we used an amortization calculator to see how much equity would be gained in a home over a five-year period from buying a home for \$300,000 at a four

percent interest rate. The amount came out to \$33,769.10 of equity after the five-year period and then we divided that by the five years to get an average of \$6,753.82, which is in the benefits side of looking at the officer perspective. The total dollar amount of benefits that we monetized for a naval officer from staying in the same geographical area for back to back tours and not doing a PCS move came out to \$20,036.94.

The proposal costs to a naval officer that would not be able to network throughout the entire Supply Corps community came up to the \$625.20. This amount came from the officer not getting promoted to LCDR, which was a difference of \$781.50. That number was then multiplied by 12 to get an annual difference of \$9,378, in which we then divided it over the 15-year career that we have been looking at, which equals the \$625.20 per year. The total net benefits to a Naval Supply Corps officer upon implementation of this proposal would be \$19,411.74.

The first proposal benefit from the Navy's perspective is the \$4,285,632.00 they would save each year in PCS costs. To get this number we took the 1,717 Supply Corps officers from O-1 through O-4 and multiplied it by the RAND's figure of 26 percent of military members that PCS each year, and then multiplied that by the average PCS cost of \$9,600 from OPNAV (Vanpoole, 2018). The next benefit that the Navy gains is the full employment of their officers who are not looking for housing at their next duty station. We once again took the 1,717 Supply Corps Officers and multiplied it by the 26 percent who PCS each year and then multiplied that by the \$2,807.72 benefit from each officer not looking for housing at their next duty station. This amount totals to \$1,253,422.36 in benefits to the United States Navy. The third benefit from the Navy's perspective is the spousal income that has no cost or benefit to the Navy.

The fourth benefit that the Navy would receive would be that of having geographical resident experts in certain areas. How we calculated the value of this was by looking at the Department of the Navy 2019 fiscal year budget proposal with all the 2018 budgeted amounts. The budgeted travel training for 2018 is \$89,865,000, which was divided by 327,396 personnel that equaled \$274.48 per person, per year. We then looked at another opportunity cost for these officers not performing at 100 percent for six months due to training and a learning curve. We calculated an O-3 with four-years of service

makes \$5,528 a month and multiplied that by 12.5 percent, which would be \$691. The reason we used 12.5 percent is because we indicated that the officer would only be performing at 75 percent for the first six months and then 100 percent for the next 6 months of that year. When the two figures are added together over a one-year period, it will equal 87.5 percent, which the inverse is 12.5 percent and that is the \$691. We then took the sum of \$274.48 and \$691 that equaled \$965.48 and multiplied that number by the 447 officers (1717 multiplied by .26) to get the benefit of \$431,569.56.

The next three benefits of achieving career milestones, stability and quality of life, as well as spousal employment could not be monetized as a benefit to the Navy, as it only is a benefit to the naval officer.

The proposal costs to the Navy was calculated by taking the \$691 from not being 100 percent efficient at their jobs and multiplying it by the total amount of Supply Corps Officers, O-1 through O-4. There are currently 1,717 officers, and when multiplied by the \$691, it equaled \$1,186,447 in costs to the Navy for officers who might become complacent in their jobs. The total net benefits to the Navy upon implementation of this proposal would be \$4,784,176.92. This is nearly \$5 million of savings each year for fewer than 2,000 Supply Corps Officers, which is a very small percentage of the Navy as a whole.

## **6. Discount the Benefits and Costs to Obtain Present Values**

In step six the analyst will calculate the future benefits and costs over the life of the project. They will then use a specified discount rate to bring that future value back to today's present value.

In our Financial Cost-Benefit analysis we look at the benefits over the 15-year initial implementation of this proposal. We then discount those figures back to obtain present value of the proposal to the Navy. The reason why we selected 15 years is because that is the milestone for an officer achieving the rank of CDR. We inflated our numbers by using the Joint Inflation Calculator (January 2018), for 15 years, and then discounted it back to 2018 dollars. The total net benefits to the Navy would be \$4,784,176.92 after the first year, and then inflating that number for 15 years the total net



benefits to the Navy would be \$85,174,174.89 in 2033. By using the Joint Inflation Calculator and bringing it back to Net present value (NPV) in 2018 dollars, the amount equals \$62,408,226.59 in total net benefits to the Navy.

#### **7. Compute the Net Present Value of Each Alternative**

This step is addressed by simply subtracting the costs from the benefits to obtain the net present value. According to *OMB* (1992), “NPV is computed by assigning monetary values to benefits and costs, discounting future benefits and costs using an appropriate discount rate and subtracting the sum total of discounted costs from the sum total of discounted benefits” (Office of Management and Budget, 1992, p. 4). Since there is only one alternative to the proposal, it can be concluded that the sum of discounted benefits equals the \$62,408,226.59 as stated above in section six, the present value block.

#### **8. Perform Sensitivity Analysis**

The eighth step allows the analyst to justify the validity of the estimates and assumptions. Sensitivity analysis can be performed by changing the range of values for several variables. This step of the Financial CBA will be explained in further detail in Chapter IV.

#### **9. Make a Recommendation**

The final step of the Financial CBA will be detailed in Chapter V, where we will formulate our recommendation and our conclusion.

### **C. CHAPTER SUMMARY**

The major takeaways for the Navy Supply Corps Officer who decides to stay in the same geographical location for two consecutive tours is that he or she will receive a total estimated net benefit of \$19,411.74. Furthermore, if this program is initiated for the O-1 to O-4 Supply Corps Officers, the United States Navy will see an estimated total net benefit of \$4,784,176.92 after the first year of implementation, given the assumptions and the approach used in this study.

## **IV. SENSITIVITY ANALYSIS**

### **A. IMPACT OF USING A STANDARD DEVIATION**

This chapter will examine how sensitive the estimated net benefit to some of the assumptions used in the FCBA. We know that inflation rates and discount factors can change from year to year, but what we are looking at is ultimately seeing what the benefits and costs will look like using a standard deviation given from our RAND data, as well as swapping out an inflation rate with two different discount factors. As discussed in chapter three, the total net benefits to the Navy are estimated at \$4,784,176.92 after the first year of implementation. We test the relation of the estimated net benefits and the assumed number of PCS moves in a given year. The Burke and Miller (2016) data showed that there is a standard deviation of 0.438 for the percentage of PCS moves in a year, which would increase the overall dollar amount to \$14,115,353.12, which is shown in Table 8. By varying the number of PCS moves in the range set by the extreme standard deviation of 0.438 around the mean of 0.26, with the number of PCS moves ranges 1.1 million to 1.7 million PCS moves. The estimated net benefits are shown in Table 8 and show that if the Supply Corps community implements this policy they could save the Navy over \$9.3 million in a given year if there is just one standard deviation (0.438) away from the mean (0.26).

Table 8. Sensitivity Analysis in Estimated Net Benefits when Varying the Number of PCS Moves

<b>Proposal Benefits</b>	<b>Officer Perspective</b>	<b>NAVY Perspective</b>
Eliminates time in relocation efforts	\$ 1,725.00	\$ 11,505,273.60
Not looking for Housing at new duty station	\$ 2,807.72	\$ 3,364,956.96
Spousal income	\$ 4,525.20	-
Geographical resident expert	-	\$ 431,569.56
Achieving career milestones	\$ 625.20	-
Stability and Quality of Life	\$ 3,600.00	-
Buy a home versus rent	\$ 6,753.82	\$ -
<b>Total Benefits</b>	<b>\$ 20,036.94</b>	<b>\$ 15,301,800.12</b>
<b>Proposal Costs</b>	<b>Officer Perspective</b>	<b>NAVY Perspective</b>
Unable to network throughout the entire Supply community and missing career	\$ 625.20	-
Potential for complacency	-	\$ 1,186,447.00
<b>Total Costs</b>	<b>\$ 625.20</b>	<b>\$ 1,186,447.00</b>
<b>Net Benefits</b>	<b>\$ 19,411.74</b>	<b>\$ 14,115,353.12</b>

## B. IMPACT OF TWO DIFFERENT DISCOUNT FACTORS

The next step we took for our sensitivity analysis was to look at the total net benefits that the Navy would gain from implementing this policy over a 15-year program, which would be \$85,174,174.89 in 2033. As stated previously, by using the Joint Inflation calculator we concluded that the NPV in 2018 dollars would be \$62,408,226.59 in total net benefits to the Navy. That inflation calculator was using a rate of 2.095%, which is the estimated inflation rate for those time periods, and for Military Procurement, Navy dollars. Therefore, the process that we took was to use the present value formula in an excel workbook to determine that when the \$85,174,174.89 is multiplied with a seven percent discount rate, the present value to the Navy will be \$79,602,032.61. The seven percent discount rate is what the *OMB Circular No. A-94*, Revised says is the base guideline. This rate is similar to the rate of return on an investment in the private sector (Office of Management and Budget, 1992). We then determined that by using the five percent discount rate it would give the Navy a total net benefit of \$81,118,261.80. There are plethora's of other sensitivity analysis that will be looked at and will be discussed for future research in Chapter five.

## **C. CHAPTER SUMMARY**

This chapter discussed what might happen if the Navy implemented this program and the range of the estimated total net benefits from back-to-back tours in the same CONUS geographical location versus the status quo, showing costs savings overall.

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## **V. SUMMARY, CONCLUSION AND RECOMMENDATIONS**

### **A. SUMMARY**

In this research we conducted a financial cost-benefit analysis to examine the costs and cost savings generated by the alternative PCS policy of allowing service members in the same geographical location for back-to-back tours. Our analysis shows that this alternative PCS policy can contribute to saving money to the DoD. Moreover, our findings show that two consecutive tours in the same command might also act as a non-monetary incentive to retain highly talented, qualified officers who might face work-life balance constraints. In this study we focused on the Navy Supply Corps community with the goal of building a proof of concept that may be applied to other naval communities.

This MBA project will develop a decision-support financial cost-benefit model that will be adjustable to include any updates in the assumptions or data estimations used in the model. The model developed in this study will provide insight and decision support regarding the current Naval Supply Corps Officer, O1–O4 PCS policy and the relative strengths and weakness of the alternative PCS policy of staying in the same geographical location for two tours when compared with the status quo.

The financial cost benefit analysis conducted in this research may allow senior leadership within the Supply Corps community to evaluate the costs and benefits of the alternative PCS policy with two, back-to-back tours in the same CONUS geographical location. The analysis conducted in this study attempted to estimate the benefits and costs associated with the alternate PCS policy by using data estimates from previous studies, and by making assumptions and best-knowledge decisions. Additionally, there were costs and benefits that we were unable to monetize in this study. Lastly, every officer has different preferences and priorities, which directly influence his or her decision when it comes to a PCS move. The analysis was conducted primarily from a financial perspective on the officer's behalf with some costs and benefits directly affecting the Navy as a whole. No additional in-depth research was conducted to

determine if there were any advantages or disadvantages regarding an officer's perspective career milestones.

## **B. CONCLUSIONS AND RECOMMENDATIONS**

### **1. Primary Research Question**

Can the Navy save in Permanent Change of Station costs for Supply Officers, O1-O4, by implementing a two-tour minimum requirement in the same CONUS, geographical location for their first 15 years of service?

This research project allowed our team to look at the PCS policy and propose a revised PCS policy that benefits both the officer and the U.S. Navy. Based on the steps, assumptions and data used, our findings show that reducing the amount of PCS moves throughout a naval career can generate savings while still supporting the Supply Corps mission and meeting all of the objectives and milestones. Our analysis takes the view that stability within the family household is valuable so that a spouse can have a career and provide an essential upbringing for their children. This type of lifestyle is more sustainable throughout one's military career when PCS moves are reduced.

From our study, the reduction in the total amount of PCS moves can save the U.S. Navy millions of dollars each year. Since the average cost of a PCS move is \$9,600 (Vanpoole, 2018), which is multiplied by the 446 officers (1,717 Supply officers O4 and below multiplied by the average number of PCS per year in the DoD which is 0.26) can result in nearly \$5 million cost avoidance per year within the Supply Corps community alone. PCS funding is critical in the ability to successfully move naval forces; therefore, we must ensure we spend each PCS dollar efficiently.

The Supply Corps community manager should conduct a study for new accessions regardless of their commissioning source under the alternative PCS policy proposed here. The sample size should be limited to perspective officers that have no prior military service. With the officer quotas varying from each fiscal year, the sample size should consist of no less than 25 percent but no greater than 33 percent for each fiscal year. To account for officers resigning their commission before their 15-year mark, there would be no obligated service requirement to be part of this case study. The sample

size of these officers would have to voluntarily elect to be a part of this case study before graduating from the NSCS and heading to their first billet. These records would be documented with a back-to-back (B2B) AQD, indicating that they are part of this case study. All PCS moves would be tracked for the first 15 years of the officer's careers. This data would allow the Supply Corps community to evaluate if these officers are being promoted along with their peers in lieu of this alternative PCS policy. If so, this would be a significant benefit to the Supply Corps community and may reshape how PCS moves occur in the future. Navy leadership and policymakers need to take a hard look for ways to maximize these limited PCS dollars by revisiting the current PCS policy.

## **2. Secondary Research Question**

What are the main impacts, tangible and intangible, that should be considered in deciding whether a two-tour minimum requirement in the same CONUS location is a cost-saving alternative to the status quo?

There were many tangible and intangible impacts such as buying a home, renting, or stability that can be associated with each PCS move. Some of these may have significant or minor influences depending on each officer's situation. For example, these impacts can vary for an officer with a family versus a unmarried officer; an officer with a family will may want to buy versus rent and may have to worry about schooling for their child. The results from our study show that there are benefits to the officer as well as the Navy from the alternative PCS policy of allowing service members in the same geographical location for back-to-back tours.

Stability and quality of life have significant impacts to the officer. This proposed PCS policy allows the officer to remain in the same geographical location for at least a five-year period, which impacts all officers regardless of marital status. Longer stability in the same geographical location can help with work-life balance issues, by helping with the raising of their children, creating the fundamental elements and central foundation, long lasting friendships and minimal lifestyle disruptions.

Becoming a homeowner is considered a life changing event. By remaining in the same geographical location, it will encourage more home ownership rather than renting



or living in base housing. Within a five-year period, an officer can reach over \$30,000 in home equity rather than just paying rent while gaining no equity or financial stability for later in their career.

The Supply Corps community manager should create a working group to survey and interview officers in different categories and various paygrades on PCS for back-to-back tours in the same location. The working group would be able to capture the officers' priorities when making the decision to PCS to a new duty station or remain in the same geographical location.

### **C. LIMITATIONS**

The research shown in this study was limited to the costs and benefits that could be monetized. Secondly, there is a possibility that not all quantifiable costs and benefits were captured in this case study. Some officers prioritize and evaluate their costs and benefits differently when it comes to a PCS move. There could be various reasons an officer may choose to or not to conduct a PCS move.

Another limitation that we came across was not having enough time to monetize or gather further data on the costs or benefits to the Navy for not having PCS moves at all. By eliminating all PCS moves, the Navy could drastically decrease their annual budget spending and properly fund other, more important projects.

### **D. FUTURE RESEARCH**

This research project exposed benefits strictly to the Supply Corps community. We felt it was easier to evaluate the benefits and costs for this community, with only 1,717 Supply Corps officers from the ranks of ENS through LCDR. Future research and consideration should be conducted in other communities, particularly within the smaller Staff corps and restricted line communities to validate if they can also benefit from this revised PCS policy.

If the data continues to confirm that benefits outweigh the costs, then the Navy should widen its scope. Future research and consideration in evaluating the larger communities such as the Aviation, Surface Warfare, and Submarine officers would

require a full-time research team with adequate funding. Finally, there would have to be a few years of implementation for this revised PCS policy before looking at the enlisted communities as well.

With an improving economy and potential for better job opportunities outside the Navy, this revised PCS policy may serve as a good retention tool for officers that are thinking of resigning their commission. A study should be conducted to identify if a retention bonus would influence an officer whom is on the fence of going to the civilian sector to stay in the armed forces.

As discussed as an impact in step 3 of the CBA, we need to look further into the possibility of the Navy eliminating the PCS policy. By eliminating the PCS program all together, does the Navy remain a global dominant force as it is known today? This idea should be researched in further detail, as a possible extended CBA to determine if it would be right for the DoD to implement.

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