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COMPARING THE COST OF CIVILIANS AND CONTRACTORS

Performance of Comparable DoD Functions

Office of the Secretary of Defense

Cost Assessment and Program Evaluation

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Preparation of this report cost the Department of Defense a total of approximately $604,000 in Fiscal Years 2016-2017. This includes $30,000 in expenses and $574,000 in DoD labor.

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Executive Summary

In response to Congressional requests in committee reports accompanying the Fiscal Year 2016 National Defense Authorization Act (FY 2016 NDAA), the Deputy Secretary of Defense directed the Office of the Secretary of Defense (OSD) Cost Assessment and Program Evaluation (CAPE) to: conduct a study comparing fully burdened costs of Department of Defense (DoD) civilians and contractors performing similar functions that includes a minimum of four Continental United States (CONUS) and two Outside the Continental United States (OCONUS) locations; and assesses flexible authorities that are available for employment and retention of DoD civilian employees. The study also addresses Congressional questions concerning workforce costing methodology pursuant to Department of Defense Instruction (DoDI) 7041.04.

In Part I of this study, we focus on fully burdened civilian-contractor cost comparisons. We analyze a full range of functions from 17 organizations in 8 geographic regions, with some organizations having a presence in multiple locations. We use a sample of locations and include a distribution of civilian-contractor comparisons that represents the Military Departments, Defense Agencies, and Defense-wide organizations. We include comparisons from varying levels of expertise and different government civilian pay systems. The civilian-contractor cost comparisons are calculated using a standard methodology for all organizations that controls for differences in locality pay and annual hours of work. We use calendar year 2015 data for all comparisons.

In Part II of this study, we assess the flexible authorities available for employment and retention of DoD civilian employees. We use the same organizations and locations that we studied in Part I. Many research initiatives view the analyses of employment costs and hiring authorities as disparate or thinly connected domains. Sampling from a broad spectrum of organizational missions, we present surveyed responses from hiring officials and human resource professionals. We refrain from drawing connections between the responses and the specific functions performed by each organization. It is reasonable, however, to assume that there may be significant corollaries between the use of these authorities and the civilian-contractor costs and hiring decisions made by each of the organizations. An evaluation of authorities tailored to functional groups may be a suitable extension to this analysis.

In Part III, we address the use of DoDI 7041.04, "Estimating and Comparing the Full Costs of Civilian and Active Duty Military Manpower and Contract Support." In particular, we address actions within the Department pertaining to recommendations from a previous Government Accountability Office report and discuss the tools and guidance that OSD(CAPE) incorporates in the cost-comparison process to facilitate workforce mix decisions among Military Departments, Defense Agencies, and Defense-wide organizations.

Key Assumptions

- Cost comparisons can be made when government civilians and contractors are performing functions that are at least 80 percent comparable.
- Calendar year 2015 consisted of 27 civilian pay dates, compared to most years that have 26 pay dates. This study excludes the first pay date (12/14/2014 - 12/27/2014) and uses civilian pay data from 12/28/2014 through 12/26/2015, which yields 26 pay periods that are used in the study.
- Civilian overtime pay is excluded from the cost comparisons due to the standardization of labor hours; however, overtime pay is a significant part of civilian compensation for some organizations.

Summary of Findings

Part I: Civilian-Contractor Cost Ratios

We use a civilian-contractor cost ratio to make comparisons of DoD civilian and contractor fully burdened costs. The cost ratio statistic summarizes the relationship between the fully burdened costs of DoD civilians and contractors. If civilian costs are greater than contractor costs, we calculate the cost ratio as the average cost of civilians divided by the average cost of contractors performing a comparable function. Conversely, if contractor costs are greater than civilian costs, we calculate the cost ratio as the average cost of contractors divided by the average cost of civilians performing a comparable function. Additionally, we use the marginal difference in average civilian and contractor costs, measured as a difference in percentage from the manpower type with the lowest average cost, to present statistical relationships.

The results of our analysis present numerous findings, which we list below. It is important to note that these findings are specific to certain parameters and do not provide a basis for generalized conclusions across the DoD-wide enterprise. The results of this study incorporate nearly 600 comparisons by function and location and include more than 21,000 civilian and contractor FTEs.

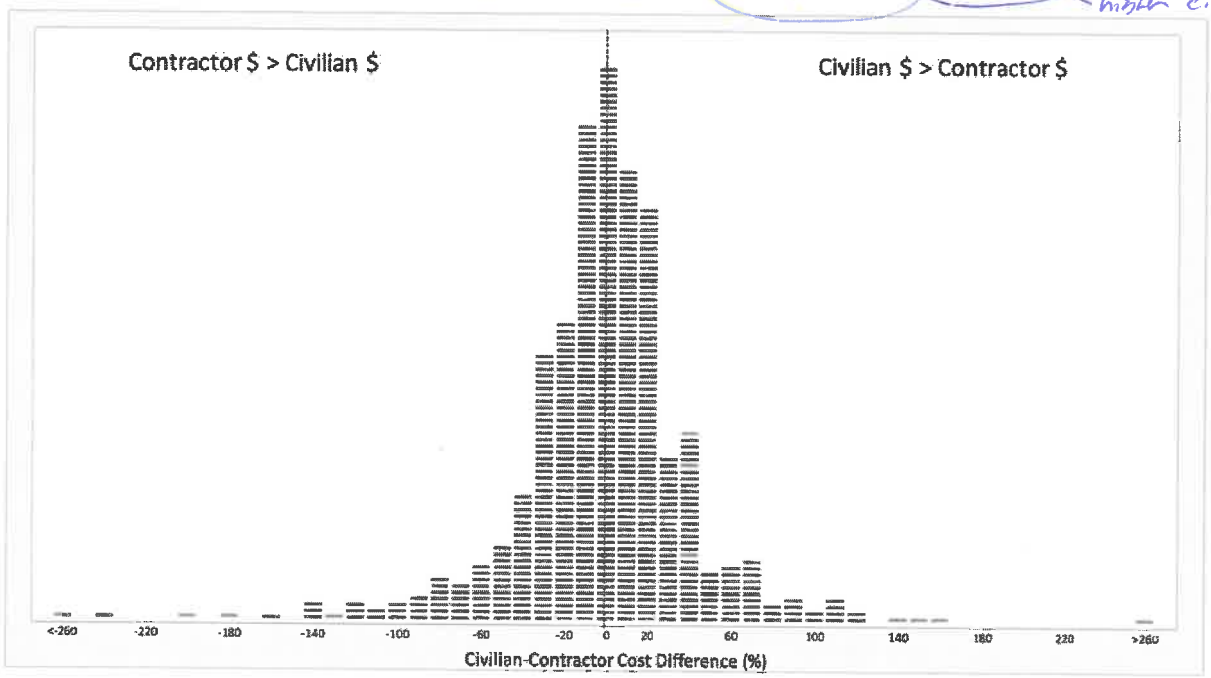
Differences in DoD Civilian and Contractor Costs

- There is no discernable evidence to suggest that DoD civilians predominantly have higher or lower fully burdened costs to the government than contractors do. Generally, whether DoD civilians or contractors have higher costs to the government varies by organization, location, and function being performed.
- The figure below displays a distribution of civilian-contractor comparisons, with each symbol representing a civilian-contractor comparison.[1] Cost difference is defined as the difference between average civilian costs and average contractor costs in a comparison group. We assign

[1] The number of individuals in a comparison can range from one-to-one to many-to-many. The smallest comparison group consists of one civilian FTE and one contractor FTE. The largest comparison group consists of 760 civilian FTEs and 290 contractor FTEs.

cost differences with contractor-costs-greater-than-civilian-costs a negative value, and cost differences with civilian-costs-greater-than-contractor-costs a positive value. Using this approach, we found:

- The number of comparisons with higher civilian costs and the number with higher contractor costs are nearly equivalent.
- The median value of the distribution for all civilian-contractor cost differences is -5.0 percent, which signifies that roughly half of the cost comparisons are above zero (higher civilian costs) and half are below zero (higher contractor costs).[2]
- Cost differences for all comparisons range from -316 percent to 154 percent.[3]



Distribution of Civilian-Contractor Cost Comparison Groups

Civilian-Contractor Cost Ratios by Organization

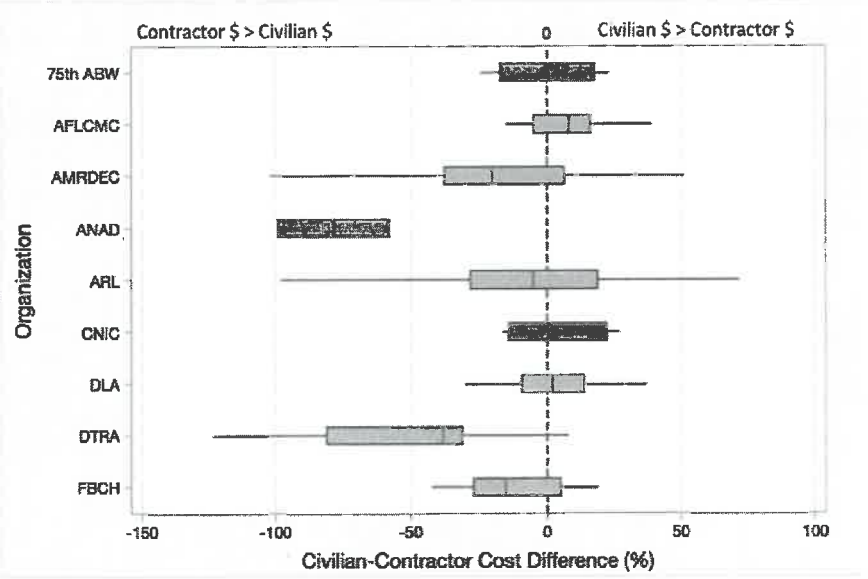
- Out of seventeen CONUS and OCONUS organizations included in our analysis, eight organizations have median cost differences greater than or equal to zero; whereas, nine organizations have medians less than zero.[4]
- One organization has higher civilian costs for at least 75 percent of comparisons: Naval Facilities and Engineering Command (NAVFAC)-Guam. NAVFAC-Guam costs are influenced by the

[2] The mean value of the cost differences is -5.8 percent, which indicates that the distribution is not significantly skewed towards greater civilian costs or greater contractor costs.
[3] This range excludes one comparison, which is a statistical outlier.
[4] Positive differences represent higher civilian costs; negative differences represent higher contractor costs.

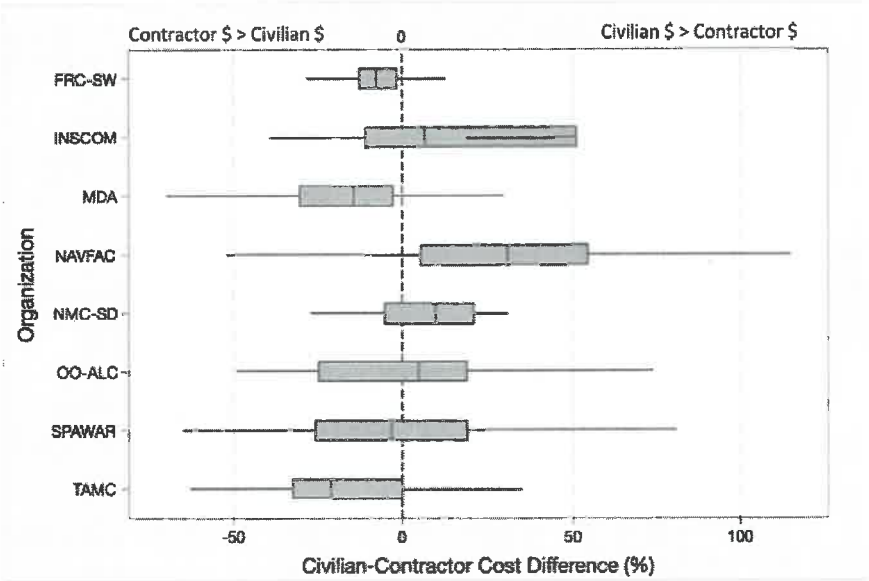
local labor environment for contractors and government civilians. Civilian labor rates in Guam are affected by hiring and retention incentives, Cost of Living Allowance (COLA), and Non-Foreign Post Differential (NFPD) pay.

- Four organizations have lower civilian costs for at least 75 percent of comparisons: Anniston Army Depot (ANAD); Defense Threat Reduction Agency (DTRA); Missile Defense Agency (MDA); and Tripler Army Medical Center (TAMC).

The above three findings are illustrated in the following boxplot diagrams.



Boxplot distributions of civilian-contractor differences by organization (1 of 2)



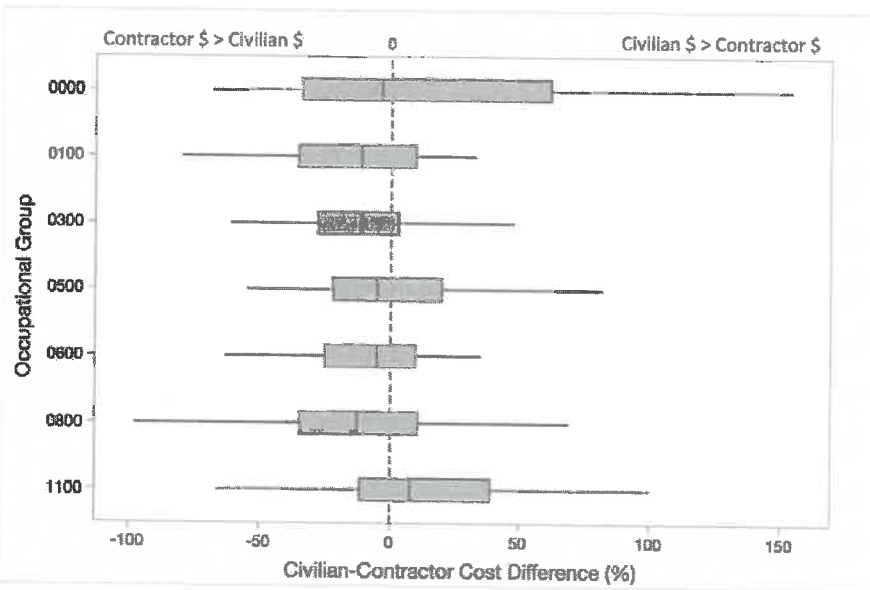
Boxplot distributions of civilian-contractor differences by organization (2 of 2)

- The Southeast region is the most unbalanced towards higher contractor costs. The bottom three quartiles of cost ratios in this region are below zero; therefore, at least 75 percent of these comparison groups have lower civilian costs than contractor costs.

Civilian-Contractor Cost Ratios by Functional Group

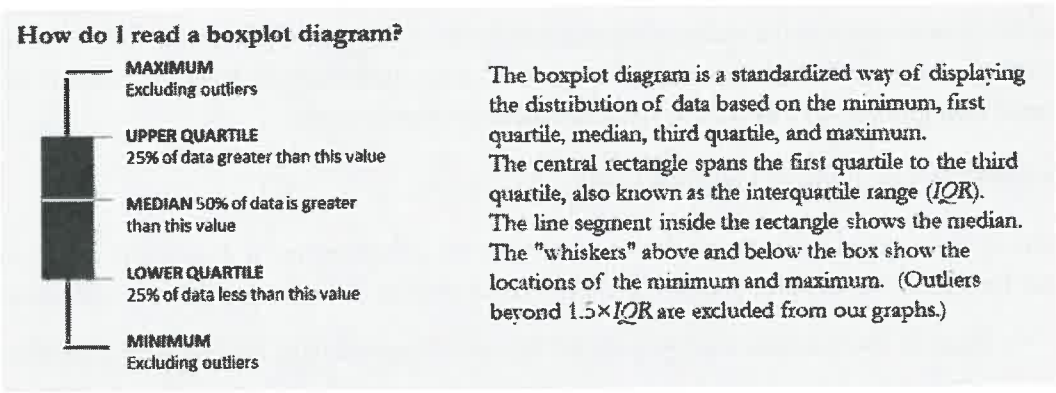
- There is some disparity in the civilian-contractor cost comparisons by functional group, but for most functions, the equilibrium (zero) is less than a quartile from the median cost difference.
  - Four of the fourteen most populated functional groups have median cost differences that are greater than or equal to zero (civilian ≥ contractor), and ten functional groups have median cost differences that are less than zero (contractor > civilian).
  - For thirteen out of the fourteen most populated functional groups, at least 25 percent of the comparisons have higher civilian costs and at least 25 percent of the comparisons have higher contractor costs (i.e. the x=0 trend line intersects the interquartile box).
  - One functional group, Equipment, Facilities, and Services (1600), has at least 75 percent of comparisons with higher civilian costs.[6]
  - No functional groups have less than 25 percent of comparisons with higher civilian costs (i.e. the x=0 trend line never intersects the top quartile or boxplot "whisker").

The above comparisons by functional group are illustrated in the following two boxplot diagrams.



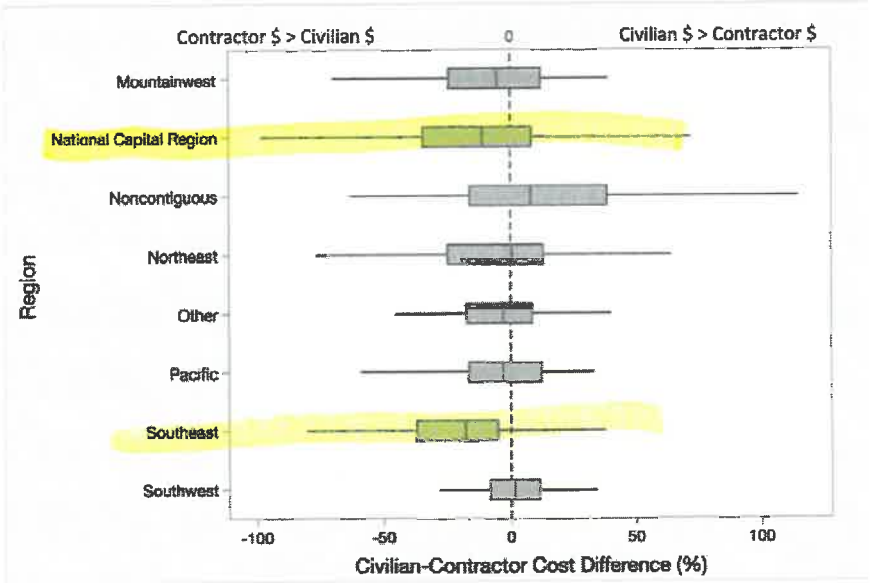
Boxplot distributions of civilian-contractor cost differences by Occupational Group (0000-1100)

[6] Functional groups are cross-mapped to civilian occupational groups and families defined by the Office of Personnel Management. Equipment, Facilities, and Services (1600) represents one occupational group.



Civilian-Contractor Cost Ratios by Region

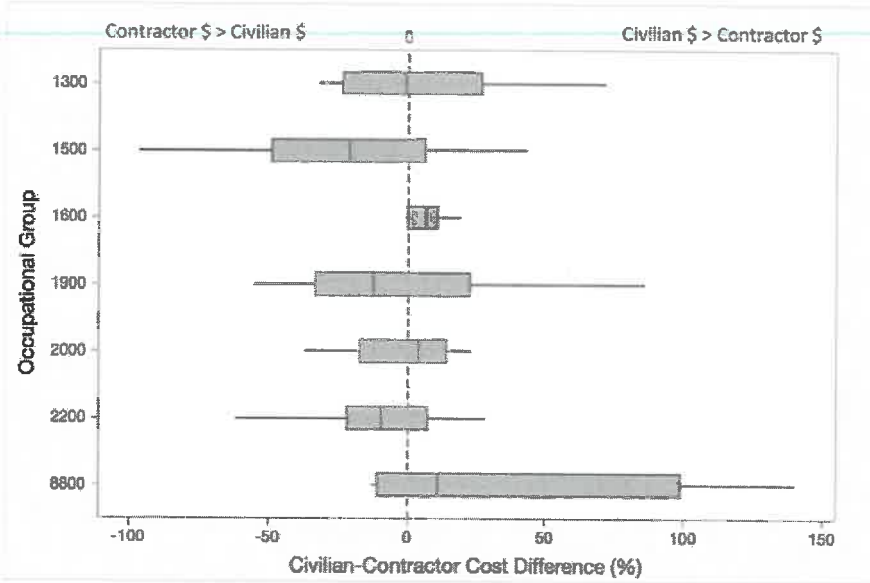
The distribution of cost ratios for cost comparisons, grouped by region, are illustrated in the boxplot diagram below.



Boxplot distributions of civilian-contractor cost differences by region

- Civilian-contractor cost ratios appear to vary by region, but are highly correlated with functions due to the limited number of organizations that we sampled in each region.
  - The regions with the highest civilian-to-contractor cost ratios are the Noncontiguous and Southwest regions.
  - The Southeast region and National Capital Region have the highest contractor-to-civilian cost ratios.[5]

[5] High contractor-to-civilian ratios have larger negative values in the boxplot diagram. The sample size for the Midwest region is too small to draw meaningful inferences.

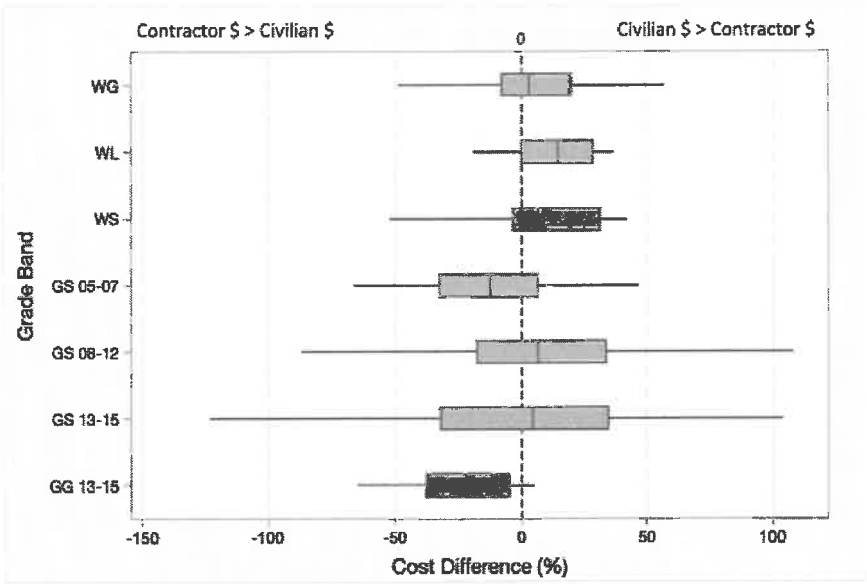


Boxplot distributions of civilian-contractor cost differences by Occupational Group (1300-8800)

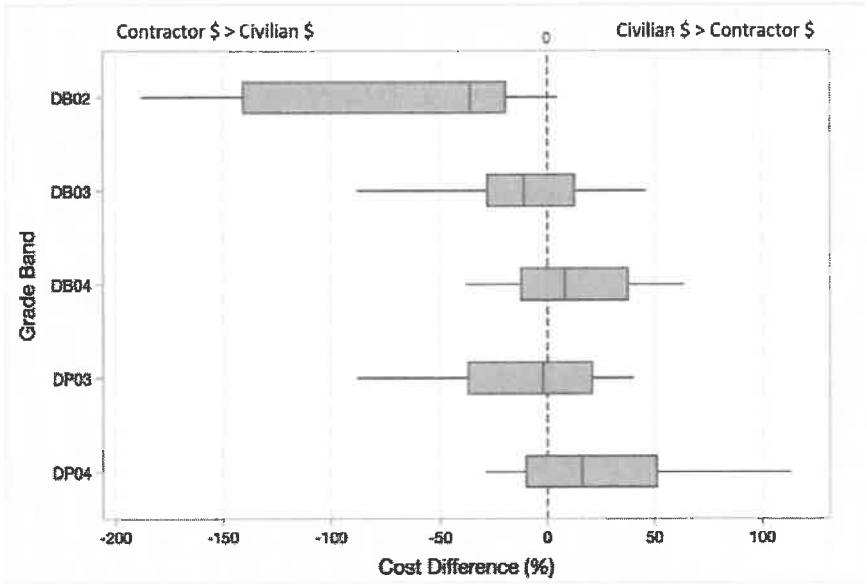
Civilian-Contractor Cost Ratios by Pay Grade

- The majority of civilians in this study are employed within General Schedule pay system or the Federal Wage System. We were able to make civilian-contractor cost comparisons within multiple pay systems and pay bands to include:
  - General Schedule (GS);
  - Federal Wage System (FWS): Wage Grade (WG), Wage Leader (WL), and Wage Supervisor (WS);
  - General Government (GG);
  - Demonstration Projects: Engineer/Scientist (DB), Demonstration Professional (DP), Business and Technical Management Professional (NH), Supervisor/Manager (NM), and Administrative Specialist/Professional (NO).
- Civilian-contractor cost ratios tend to increase towards greater civilian costs as grade levels increase within pay systems.

Civilian-contractor cost comparisons by pay scale or pay band categories are illustrated in the following three boxplot diagrams.



Boxplot distributions of civilian-contractor cost differences by pay grade (FWS, GS, and GG)



Boxplot distributions of civilian-contractor cost differences by pay grade (DB and DP)

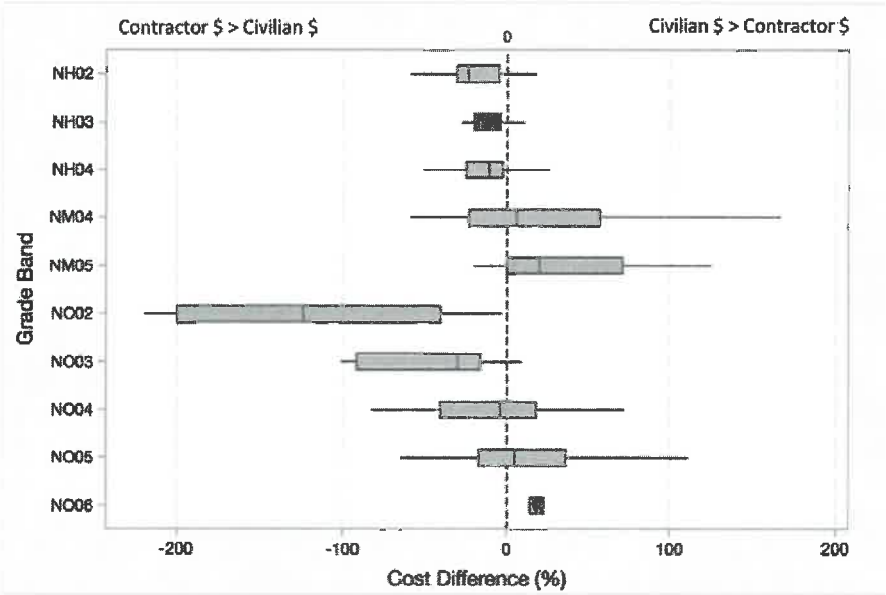
Recommendation

DoD and the Office of Personnel Management (OPM) should explore opportunities to refine, consolidate, or reduce: unused, inefficient, or cumbersome hiring authorities.

- Many hiring decisions are timing decisions rather than cost decisions.
- The rate at which organizations use Veterans Hiring Authorities for new hires has remained fairly constant during the last ten years at about 20 percent of all new hires.
- Retention tools available to managers appear to be satisfactory; however, with 37 percent of DoD civilians leaving Federal Service voluntarily prior to retirement there may be an opportunity to evaluate better methods for retaining civilian employees.

Part III: Use of Department of Defense Instruction (DoDI) 7041.04

In response to the Joint Explanatory Statement accompanying the FY 2016 NDAA, we address previous GAO recommendations to improve DoD's estimates and comparisons of the full cost of its military, civilian, and contractor workforces. Additionally, we discuss OSD(CAPE) guidance regarding the use of DoDI 7041.04, "Estimating and Comparing the Full Costs of Civilian and Active Duty Military Manpower and Contract Support," dated July 3, 2013, as part of the workforce mix decision process and highlight a lack of awareness pertaining to cost estimating guidance. Of the individuals interviewed in each of our site visits, nearly all were unaware of either DoDI 7041.04 or the Full Cost of Manpower (FCoM) web-based tool. Most individuals were unaware of both.



Boxplot distributions of civilian-contractor cost differences by pay grade (NH, NM, NO)

Part II: Hiring Authorities and Retention Tools

In response to the Congressional request to assess the flexible authorities available for employment and retention of DoD civilian employees, we used a qualitative approach. We distributed a data collection tool to each organization that participated in Part I of this study. We collected feedback, opinions, and suggestions from senior leaders, middle managers, front-line supervisors, human resource professionals, and non-bargaining human resource staff.

- Our assessment of the hiring authorities has five over-arching findings and one recommendation:

  Findings

  1. Use of hiring authorities varies by organization;
  2. Management officials are not always familiar with all of the authorities available;
  3. Hiring officials believe that some hiring authorities restrict them from hiring the most qualified employees;
  4. Management officials and human resource professionals at all levels state that they need expanded use of Direct-Hire Authority (DHA) and Expedited Hiring Authority (EHA) to be more effective in producing higher quality hires than they are under current authorities.
  5. While not perfect, hiring authorities do meet the intent of achieving the public policy objectives of balancing the need to increase flexibility of supervisors while granting preferences to select job applicants.

Introduction

The Economic and Manpower Analysis Division within the Office of the Secretary of Defense (OSD) Cost Assessment and Program Evaluation (CAPE) conducted this study beginning in December 2015. The purpose of this study was to conduct a fully burdened cost comparison of Department of Defense (DoD) civilians and contractors performing similar functions. The results and findings presented in this document reflect a sampling of data from organizations representing the Military Departments, Defense Agencies, and Defense-wide organizations.

This analysis provides a representation of multiple workforce functions and geographic areas, we do not, however, extend the findings to make statistically significant broad conclusions about all organizations and functions within DoD. We recognize and understand that cost is one factor of personnel management and workforce mix decisions. Other factors include hiring time, duration of tasks, productivity, and economic conditions in the local labor market. In this study, however, we focus on costs in accordance with FY 2016 NDAA reporting requirements. Therefore, we do not make cost-benefit assessments of civilian versus contractor hiring practices or evaluate productivity and efficiency.

The remainder of this section details the Congressional requests that guided this analysis and describes the limitations of the study along with presenting previous related research. In Section 2, we present the methodology used for comparisons. Section 3 presents numerous case studies and narratives, which are organized by general functional categories. Section 4 offers a summarized analysis of the findings and an interpretation of results. Section 5 assesses the flexible authorities available for employment and retention of DoD civilian employees. Lastly, Section 6 provides a sampling analysis of Components' use of Department of Defense Instruction (DoDI) 7041.04 use to address questions presented in the Joint Explanatory Statement described in Section 1.1.2.

1.1. Directives and Requests

The Deputy Secretary of Defense directed OSD(CAPE) to conduct a study that compares the fully burdened cost of DoD civilian personnel and contractors performing comparable functions, which includes a minimum of four Continental United States (CONUS) and two Outside the Continental United States (OCONUS) locations.

1.1.1. Senate Report

The Senate Report 114-49, accompanying S.1376 of FY 2016 NDAA, requests DoD to conduct a study comparing the fully burdened cost of DoD civilian personnel to contractors performing comparable functions and to deliver a report of the study by February 1, 2016.[7] On November 20, 2015, the Deputy Secretary of Defense directed the Director, CAPE to lead a study that will:

[7] An approved request to delay the final report extended the submission date to December 15, 2016.

a. Compare the fully burdened costs of a sample of functions performed by DoD civilian personnel and contractors at multiple DoD installations.
b. Assess the flexible authorities available for employment and retention of DoD civilian employees.
c. Provide a written report of the study along with any recommendations to the Secretary of Defense.[8]

1.1.2. Joint Explanatory Statement Accompanying the FY16 NDAA

The Joint Explanatory Statement accompanying the FY 2016 NDAA requests the Secretary of Defense, in connection with the reporting request in Senate Report 114-49, to address the following additional items:

a. What steps has the Department taken to comply with the recommendations in GAO-13-792, "Opportunities Exist to Further Improve DoD's Methodology for Estimating the Costs of its Workforces," for improving the costing methodology in DoDI 7041.04;
b. What guidance has the Office of the Secretary of Defense issued to military components and defense agencies regarding the use of the cost-comparison process to make workforce mix decisions;
c. What roles do CAPE and the Office of the Under Secretary of Defense (Comptroller) play in the cost-comparison process, both prior to workforce sourcing decisions being made and in tracking workforce sourcing outcomes;
d. What is the Office of the Secretary of Defense doing to ensure the skills, training, or experience needed to effectively perform manpower cost comparisons are available in the DoD workforce, including completion of the competency gap assessments cited in GAO-13-188, "Critical Skills and Competency Assessments Should Help Guide DoD Civilian Workforce Decisions"; and
e. How will the findings in the report required in Senate Report 114-49 be used to improve and correct current limitations of the cost-comparison process outlined in DoDI 7041.04?

1.2. Study Limitations

This study was undertaken with specific guidance to analyze comparable functions based solely on cost. There are other factors involved in workforce mix decisions, which include hiring time, duration of tasks, productivity, and local economic conditions. In this study, however, we focus on costs in accordance with FY 2016 NDAA reporting. Because cost is only one component of any personnel management and workforce mix decisions, we did not conduct a full cost-benefit analysis of civilian versus contractor employment practices or evaluate productivity and efficiency.

[8] Memorandum, Deputy Secretary of Defense, *Report on Cost Comparison of Department of Defense (DoD) Civilian Personnel and Contractors*, November 16, 2015. (Appendix F – Memorandum, Deputy Secretary of Defense)

We encountered two significant challenges in developing comparisons of fully burdened costs. One challenge is that to compare the costs of civilians and contractors requires subjectivity. There is no direct mapping or perfect match between civilian occupational codes and contractor positions. Moreover, we found that civilians do not always perform day-to-day functions that directly relate to their occupational series or group. Therefore, we required a significant amount of cooperation from organizational components and relied on their own assessments and judgement to make comparisons.

The second significant challenge involved the complexity of service contracts. Contracts are not usually written to address the cost per contractor as a full-time equivalent; therefore, it is difficult to identify labor costs separately in a contract to estimate the costs as full-time equivalent personnel. In addition, it is difficult to extract specific functions or services from larger contracts, which cover a large number of functions and tasks. Because contracts are written to different specifications, we applied multiple methodologies for calculating contractor full-time equivalent personnel costs within each organization and functional comparison.

1.3. Previous Studies

A number of previous studies have focused on the cost of civilians and contractors in government. The objectives of these studies range from wage comparisons to workforce mix assessments. Few studies seem to exist that compare civilians and contractors based on fully burdened costs to the government.

The Center for Strategic and International Studies (CSIS) analyzed recent developments of insourcing efforts within the Department of Defense, reviewed the analytical validity of current practices, and proposed an alternative methodology for sourcing decisions between private and public providers (Berteau, Hofbauer, Ellman, Kiley, & Ben-Ari, 2011). Berteau et al. address ways to make cost estimating more analytically sound for insourcing decisions, and assess DoD's methodology for capturing the fully burdened cost of government performance. The CSIS methodology attempts to correct shortcomings from the OMB Circular A-76, particularly with respect to overhead rates. CSIS incorporates several additional changes in methodology, such as extending cost estimates from only DoD accrued costs to Federal government fully burdened costs.

The Project on Government Oversight (POGO) conducted two studies on why Federal Service contract spending is not in line with budgetary priorities. The findings in its first study include: the Federal government approves service contract billing rates that pay contractors 1.83 times more than the government pays Federal employees in total compensation (including benefits), and more than 2 times the total compensation paid in the private sector for comparable services; and Federal employees were less expensive than contractors in 33 of 35 occupational classifications reviewed by POGO (Project On Government Oversight, 2011). The second POGO study found that the cost of an average contractor full-time equivalent is nearly 3 times more than an average DoD civilian full-time equivalent. Both studies claim that using contractors to perform services can often increase taxpayer costs (Project On Government Oversight, 2012).

The most well-known government assessments of civilian versus contractor employment are A-76 studies. An A-76 study is a competition between government-operated activities and the private sector to determine whether commercial activities can be done more economically and efficiently by contract or with an in-house workforce. The Office of Management and Budget issued guidance in a 1966 Office of Management and Budget (OMB) Circular A-76 that governed cost competitions between government-operated commercial activities and the private sector. In January 2008, Congress passed legislation suspending A-76 cost competitions within the DoD. Congress has directed several reports pertaining to DoD Circular A-76 competitions. The Congressional Research Service reported on the status of the ongoing moratorium on the conduct of Department of Defense public-private competitions under OMB Circular A-76 (Bailey Grasso, 2013).

Bailey Grasso (2013) identifies major points of contention concerning the Circular A-76 policy and process, which include savings generated from the competitions, the adequacy of oversight mechanisms, and the possible performance of "inherently governmental functions" by contractors. Generally, Federal employees and labor organizations believe that A-76 is biased in favor of the private sector, while private sector contractors generally believe that Federal government employees have an unfair advantage in A-76 competitions. Proponents may view A-76 studies as a necessary mechanism for gaining efficiencies in Federal operations, while opponents may view A-76 as adversarial, expensive, and inefficient.

With respect to hiring flexibilities, in 2008, the Office of Personnel Management (OPM) completed a study of hiring flexibilities. OPM (2008) provides survey findings to participating Chief Human Capital Officer (CHCO) agencies on their use of eight appointing authorities, collectively referred to as hiring flexibilities[9]. The surveys, which capture responses from supervisors, managers, and human resources practitioners, result in the following inferences:

- When hiring flexibilities are used instead of traditional ranking and selection procedures, supervisors, managers, and HR practitioners rated these flexibilities as more efficient;
- The majority of supervisors and managers who used hiring flexibilities indicated that they are more effective in producing quality hires than traditional ranking and selection procedures;
- The majority of respondents did not use OPM resources (i.e., Hiring Flexibilities Resource Center, Presidential Management Fellows Program website) or refer to other published guidance;
- Supervisors and managers mostly rely on their HR staff for information on these hiring flexibilities;
- Participating agencies have provided a modest amount of training on these hiring flexibilities to their supervisors, managers, and HR staff.

[9] Participating agencies: Department of Agriculture, Department of Defense, Department of Homeland Security, Department of Interior, Department of Treasury, Department of Veterans Affairs, Environmental Protection Agency, and Social Security Administration.

Part I

2. Methodology

This section describes our methodology for comparing costs of government civilians and contractors. The variables associated with analyzing fully burdened costs at the individual level for all functions, locations, and DoD entities make it infeasible to conduct an analysis with sample sizes that are sufficiently large for statistically significant results across all organizations within the Department of Defense. In this section, however, we describe the methodology used to conduct a data-based analysis. It is reasonable to infer the results are representative of a broad range of functions and are not negatively informed by selection bias pertaining to important variables as described below.

2.1. Scope of Study

In defining the scope of this study, we recognize that an assessment of personnel in a workforce is guided by the underlying objective. The method of evaluating personnel decisions is shaped by the purpose of the study. Below, we define the scope in the terms of attributes that we included and those that are excluded.

2.1.1. Study Inclusions

Senate Report 114-49, accompanying S.1376 – the Senate version of the National Defense Authorization Act for FY 2016 – requests a study comparing the fully burdened cost of performance of functions by DoD civilian personnel with the fully burdened cost of the performance of comparable functions by DoD contractors. We conducted our study consistent with the Senate Report: we compare the costs of performing a full range of functions, level of expertise, and managerial responsibilities, including:

a) secretarial, clerical, or administrative duties, including data entry;
b) mid-level managers and other personnel possessing special expertise or professional qualifications; and
c) managers or other leadership.

We did not compare the costs of "personnel responsible for producing congressionally-directed reports" as requested by the Senate Report due to the lack of comparable civilian and contractor personnel performing these functions within the organizations included in our study. The Senate Report also directed that the study include four CONUS installations (we include fifteen[10]) and two OCONUS installations (we include three).[11] In addition, although the Senate Report was silent on including a mix of DoD entities, we selected functions and installations to ensure representation from

[10] The majority of the study includes data from four installations. Each Defense Logistics Agency depot facility is also counted as a separate installation.
[11] The number of organizations (17) does not align with the number of installations (18). Multiple organizations are located at the same installation and some organizations are located at multiple installations.

each of Army, Navy, Air Force, and Defense Agencies (DA) and Defense-Wide (DW) Activities. Table 1 displays the key variable (or dimensions) of the study.

Table 1. Scope of civilian and contractor comparison study

DoD Entity	Functions (Examples)	Level of Expertise	Installations
Army	Advisory and assistance services	Entry-Level	CONUS (15)
Air Force	Facilities maintenance	Mid-Level	OCONUS (3)
Navy	Research and development	Senior-Level	
Marine Corps	Medical care		
DA/DW[12]	Equipment maintenance		
	(numerous more)		

2.1.2. Study Exclusions

Unlike the OMB Circular A-76 (A-76), this study does not evaluate the process for managing public-private competitions to perform functions for the Federal government. Each case in this analysis includes functions that are already being performed by either DoD civilians or contractors without regard to efficiencies and productivity that may be possible with competition.

Additionally, this study is not an assessment of optimal workforce mix decisions. Moreover, since this study is not similar to a Government Accountability Office (GAO) review or Inspector General (IG) inspection, we did not make any assessments or claims about the value of hiring decisions. We also did not conduct an evaluation of labor "make" or "buy" management decisions. Lastly, since this is not a compensation or wage study, the cost comparisons are not analyses of individual pay scales, or labor market compensation.

2.1.3. Organizations in the Study

We selected organizations to represent the full scope of the Senate request. First, we identified organizations with large civilian populations using data from the Defense Civilian Personnel Data System (DCPDS). From the subset of organizations with a large population of civilians, we ensured a representation of all Military Departments and of diverse geographic locations. The selected organizations, shown in Table 2, had large enough populations to permit a range of functions for comparison.

We conducted on-site visits with each organization to identify civilian and contractor personnel suitable for comparisons. We collected data and received supplemental information to support the costing analysis of the applicable workforce. The approach of this study focused on constructing an accurate fully burdened cost comparison of civilians and contractors performing similar functions as described in subsequent sections.

[12] Defense Agency/Defense-Wide (DA/DW)

Table 2. Organizations included for DoD civilian and contractor cost comparisons

Organization	DoD Entity
75th Air Base Wing	Air Force
Air Force Sustainment Center Ogden Air Logistics Complex	Air Force
Air Force Lifecycle Management Center	Air Force
Anniston Army Depot	Army
Army Research Laboratory	Army
Aviation and Missile Research, Development and Engineering Center	Army
Defense Logistics Agency	DA/DW
Defense Threat Reduction Agency	DA/DW
Fleet Readiness Center Southwest	Navy
Fort Belvoir Community Hospital	Army
Missile Defense Agency	DA/DW
Naval Facilities Engineering Command	Navy
Commander, Navy Installations Command	Navy
Naval Medical Center San Diego	Navy
Space and Naval Warfare Systems Command	Navy
Tripler Army Medical Center	Army
U.S. Army Intelligence Command	Army

2.2. Function Comparison Criteria

The definition of comparable functions is inherently subjective and is not defined in the Senate Report. For consistency, we apply the same criteria to identify comparable functions in each organization. Our analysis begins with the inclusion of all personnel in every job position. The term *position* in this section is used to describe an individual performing a function rather than authorization or billet, which might be vacant, overfilled, or unrelated to the function being performed. Although we use function occupation codes to categorize summary data in this report, occupation codes do not necessarily equate to the type of work that an individual is performing. Therefore, we use a systematic and collaborative approach to identify comparable functions or positions.

With input from each organization, we exclude civilian positions that do not have equivalent contractor positions and we likewise exclude contractor positions that do have not equivalent civilian positions. We limit our comparisons to cases where government civilians and contractors are performing functions that are at least 80 percent comparable. We therefore exclude positions in which more than 20 percent of the work being performed by a government civilian is different than their contractor counterpart. For that reason, we identify the function as the type of work that is actually being performed rather than rely on occupation code or job title. As an example, if an individual is assigned to an authorization that is programmed as an accountant but they are performing work that

meets the job description of a financial analyst, we treat the position as a financial analyst position vice an accountant position to make a comparison.[13] We worked closely with organizations to understand the functions that their workforce (civilian and contractor) actually perform.

We do not automatically exclude comparable positions at different locations. Moreover, we do not exclude comparable positions based on population size, since a one-to-one comparison is informative, as is a many-to-many comparison. We also do not exclude many-to-one comparisons, which provide useful information as well. Supervisors are only excluded from our analysis if the comparable supervisory functions make up less than 80 percent of the scope of their work.

In our study, we define comparable functions to be restrictive enough to provide reasonable and informative civilian and contractor cost assessments; however, it is not so restrictive that the constraints prohibit most comparisons. For two positions to perform the same function, the work does not have to be related to the same task or project. As an example, consider two maintenance bays where, in one bay, a civilian mechanic works on M2 Bradley Infantry Fighting Vehicles (IFV), and in the other bay, a contractor mechanic works on M1127 Stryker Reconnaissance Vehicles. Both positions are vehicle mechanics and are considered comparable in this study.

2.3. Approach to Costing

In this section, we describe how we calculate DoD civilian and contractor labor costs for each organization. Our approach is consistent with DoDI 7041.04. To make comparisons across organizations, we use the same cost elements for all civilian and contractor labor costs. To estimate the full cost of DoD manpower, we include all labor and non-labor cost elements and exclude common costs such as government furnished space and government provided equipment. Additionally, we exclude overtime costs from DoD civilian calculations since we standardize a work year to be 1,880 hours.[14] For this study, we compare DoD civilian and contractor costs using data from calendar year (CY) 2015.

Contractors do not bill directly for holiday, annual, or sick leave. The cost of these are indirectly included in the price of a contract. While a contractor typically bills for 1,880 hours in a work year, the labor rate for these 1,880 hours implicitly includes the contractor's cost of an additional 200 hours of holiday, annual, or sick leave. Likewise, we assume that a government civilian typically has 1,880 work hours in a year; the government also bears the cost of an additional 200 hours due to holidays and leave. Thus, in our analysis, we assume that both government civilians and contractors have 1,880 work hours in a year. For the contractor, when we use a billable hours estimate, we multiply 1,880 hours by the labor rate (which implicitly accounts for 200 hours of holiday and leave). For government civilians, we compute the cost based on 2,080 paid hours per work year, which consists of an assumed 1,880 hours worked plus 200 hours of holiday and leave.

[13] In Section 4 of our analysis, we collect statistics by functional group and use the occupational series as a proxy for the function.

[14] In Section 3, we present overtime costs separately to provide context for the scale of this cost element exclusion.

2.3.1. DoD Civilian Costing

We estimate the costs of government civilians by using a Defense Finance and Accounting Service (DFAS) database that contains payroll data for all DoD government civilians. This helps to ensure data definition consistency and minimizes the data collection effort for organizations. Moreover, by using the same data source for all organizations, we minimize risks associated with potentially different accounting methods or increased data errors. All payroll data obtained from DFAS is from CY 2015. We note that there were 27 pay dates in CY 2015, whereas most years have 26 pay dates. As a result, if all pay dates were included, civilian salaries in CY 2015 would be approximately 4 percent greater than they would be in years with 26 pay dates. For this study, we exclude the first pay date, which corresponds to the pay period December 14, 2014 through December 27, 2014 and contains no actual work days in 2015. Civilian salaries in this study cover a 52-week work year, December 28, 2014 through December 26, 2015, which is 26 pay periods or 2,080 hours.

DFAS uses Object Class (OC) codes in its databases of civilian personnel costs to classify transactions according to the nature of the goods or services purchased. Every obligation recorded by the Department of Defense is coded into an object class. Personnel services and benefits, including those for government civilians, are recorded within OC11, OC12, and OC13 as displayed in Table 3 and defined by the Financial Management Regulation (Department of Defense 7000.14-R, 2011). Table 4 provides a description of the object class elements for personnel services and benefits.

Table 3. Object class definitions for Federal civilian employees

Load Factor	Description
OC11	Gross compensation for personal services rendered to the Government
OC12	Benefits for currently employed personnel
OC13	Benefits due to former employees or their survivors on the basis of length of service

Table 4. Object Class definitions for Personnel Services and Benefits

11.0	Personnel Compensation includes:
	11.1 Full-time permanent
	11.3 Other than full-time permanent
	11.5 Other personnel compensation
	11.7 Military personnel
	11.8 Special personal services payments
	11.9 Total personnel compensation
12.0	Personnel Benefits includes:
	12.1 Civilian personnel benefits
	12.1 Military personnel benefits
13.0	Benefits for Former Personnel

Personnel Compensation (11.0) is defined as the gross compensation for personnel services rendered to the Government by Federal civilian employees, military personnel, and non-Federal personnel. In this study, we analyze the fully burdened cost of full-time permanent DoD civilian employees. Therefore, the elements of Personnel Compensation (11.0) that we use to calculate the fully burdened costs of a civilian are full-time permanent (11.1) and other personnel compensation (11.5) categories.[15]

- Full-time permanent (11.1) costs are defined as the regular salaries and wages paid directly to civilian full-time permanent employees and other payments that become a part of the employee's basic pay rate (e.g., geographic adjustments, and critical position pay). They include regular salaries and wages paid to employees while on annual, sick, compensatory or other paid leave, and terminal leave payments
- Other personnel compensation (11.5) costs are defined as all personnel compensation above basic rates paid directly to civilian employees. They include overtime pay, holiday pay, Sunday pay, night work differential, hazardous duty pay, post differentials, other payments above basic rates, and cash incentive awards.

In our comparisons of government civilian and contractor costs, we exclude civilian overtime pay from fully burdened costs because contractor costs are based on a standard work year of 1,880 hours per contractor full-time equivalent (see Section 2.3).

Personnel Benefits (12.0) are defined as benefits for currently employed civilian, military, and certain non-Federal personnel. Civilian personnel benefits (12.1) are the elements of Personnel Benefits (12.0) that we use to calculate the fully burdened cost of a civilian.

- Civilian personnel benefits (12.1) are defined as the cash allowances paid directly to Federal civilian employees and payments to other funds for the benefit of these employees. They include recruitment and retention incentives, allowances, relocation and other expenses related to permanent change of station (PCS). These benefits also include payments to other funds, such as employee retirement, life insurance, health insurance and benefits, accident compensation (such as payments to the Office of Worker's Compensation), and Federal Insurance Contribution Act taxes.

Benefits for Former Personnel (13.0) are defined as the Benefits due to former employees or their survivors on the basis of (in part) the length of service to the Government. They include retirement benefits, severance pay, unemployment compensation, and Government payment to the Employees Health Benefits Fund for annuitants. All elements of Benefits for Former Personnel (13.0) are included to calculate the fully burdened cost of a DoD civilian.

We collected the majority of the cost component elements from DFAS and the remaining cost elements from other sources. Table 5 displays the cost component elements collected from non-DFAS sources.

[15] Object class 11.9 is the total of the amounts for object classes 11.1 through 11.8.

Table 5. Cost elements collected from non-DFAS sources

Cost Element	Non-DFAS Collection Source
Federal Employees' Compensation Act (FECA) Payments	Office of the Secretary of Defense (Comptroller)
Permanent Change of Station (PCS)	Organization
Student Loan Repayment	Organization
Training	Organization
Transit Subsidy	Washington Headquarters Services (NCR sites), Organization (San Diego sites)

Most cost component elements for civilians were collected at the individual level and reflect the actual costs incurred by the Federal government in calendar year 2015. Some cost component elements, however, could not be collected for each individual. For these cost elements, we developed an average cost per person by organization or by DoD Component, as applicable, and added the costs to the fully burdened costs of individual civilians. Table 6 displays the cost elements that were not accessible for collection at the individual level and Table 7 displays the cost elements that were frequently unavailable at the individual level for some organizations.

Table 6. Cost elements not available by individual

Cost Element	Level of Data
Federal Employees' Compensation Act (FECA) Payments	DoD Entity
Permanent Change of Station (PCS)	Organization
Voluntary Separation Incentive Payments (VSIP)	Major Command (MAJCOM)

Table 7. Cost elements frequently not available by individual

Cost Element	Level of Data
Training	Individual (first preference); Organization (second preference)
Transit Subsidy	Individual (first preference); Organization (second preference)
Student Loan Repayment	Individual (first preference); Organization (second preference)

2.3.2. Contractor Costing

Contractor full-time equivalent (CFTE) costs are significantly more difficult to calculate than civilian FTE costs. This is largely due to the fact that we cannot access a centralized database to retrieve pay data. Moreover, the level of detail available in each contract varies to the extent that we cannot use a single methodology to calculate CFTE costs. In this section, we describe the different approaches we use for CFTE costing, such that for every case, one of the methods enabled us to develop an average CFTE cost.

Some contracts do not contain separately identifiable costs for labor and non-labor elements. For example, when a contactor performs work at contractor-owned facilities, it is not possible to identify labor and non-labor costs separately. Therefore, for our study, we exclude contractors whose work is

performed at contractor-owned facilities. In other cases where contractors perform work at government-owned facilities with government-provided equipment, the facility and equipment costs can be separately identified from contractor labor costs. Thus, we limit our analysis to contract functions that occur at government facilities. Furthermore, if a function is performed on government property, the costs of goods, services, and benefits that are common to both government civilians and contractors may be excluded from both estimates.

The negotiated price of the contract includes direct costs, including labor and non-labor, and indirect costs (e.g., overhead expenses and general and administrative expenses) borne by the contractor, plus an allowance for profit.

Table 8 shows the three costing methodologies to obtain the cost per CFTE. Organizations provided data to calculate the cost per CFTE using one of the three options, depending on information available in each contract. Excludable contract costs are non-labor costs.

Table 8. Contractor costing methodologies

Option	Contractor Cost per FTE Calculations
1	Non-excludable Contract Cost ÷ Contractor FTEs
2	(Non-excludable Contract Cost ÷ Billable hours) * Standard annual billable hours
3	Labor Rate * Standard annual billable hours

The cost per CFTE using Option 1 is a ratio of the total non-excludable contract cost to the number of CFTEs. We use Option 1 when the number of CFTEs is known. We use Option 2 when the number of billable hours is known; therefore, the ratio of the non-excludable contract cost divided by billable hours is multiplied by a standard number of annual hours per CFTE. According to DoDI 7041.04, hourly rates reported in the General Services Administration (GSA) schedule can be converted to annual rates using the OMB's standard rate for productive hours of 1,776 work-hours per year, the use of this standard rate, however, is not directed or mandatory and 1,880 hours is commonly used as the standard rate for organizations. Organizations primarily use Option 3 when contract costs cannot be disaggregated based on functional comparisons, but a labor rate is known. In this case, the cost per CFTE is the labor rate multiplied by the standard number of annual billable hours. We use a standard number of annual billable hours for Option 2 and Option 3, unless the contract or labor rate is specified as a number of annual billable hours.[16]

2.4. Cost Comparisons

We collected civilian and contractor data for this study from a variety of sources and compiled them in a SAS (Statistical Analysis System) database for data management and queries. Prior to performing analysis, we implemented data cleaning and standardization procedures and constructed additional data elements. We prioritize data quality and consistency over data volume; therefore, we do not

[16] For example, DLA contractor labor rates for wage grade equivalent contractor FTEs are based on 2,080 annual labor hours.

include normalized costs for individuals with less than a full-year of 2015 employment. We do not display outliers in boxplot diagrams, although we include outliers in data tables and summary statistics throughout the report.

2.4.1. Additional Data Elements

In addition to the data elements defined in Section 2.3, a number of data elements are included or constructed to facilitate analysis. Civilians and contractors performing comparable functions within an organization are linked with a Comparison Identifier (ID). Each Comparison ID is created by the organization of ownership to identify civilian and contractor positions that are comparable.

We define eight regions as depicted in Figure 1; however, the analysis does not represent every region. Moreover, of the regions represented, the number of organizations does not provide sample sizes that can be used to make statistical inferences about an entire region.

Note: Guam is included in the Noncontiguous region.

Figure 1. Geographic regions for comparison groupings

2.4.2. Data Management

All civilian and contractor cost information for this study is stored in a single database with data fields relevant to cost analysis. Table 9 describes the full list of variables contained in the completed database and which fields are relevant to civilians and contractors.

Table 9. Database variables for DoD civilians and contractors

Cost Element	Description	Civilian	Contractor
Comparison ID	Submitted by organizations to identify comparable positions	●	●
CAPE ID	Standardized version of the Comparison ID	●	●
Individual ID	Code used to represent each civilian	●	
Location	Geographic city or military installation of an individual	●	●
Region	Geographic region of an individual (refer to Figure 1)	●	●
Pay Plan	Federal civilian pay system	●	
Grade	Grade or level on the civilian Federal pay scale	●	
Series	Four digit occupational series	●	
Functional Group	First two digits of occupational series	●	
Position	Title of job position	●	●
Fully Burdened Cost	Total cost of individual manpower to the government	●	●
Object Class 11	11.5 - Other personnel compensation costs (refer to Table 4)	●	
Object Class 12	12.0 - Civilian personnel benefits (refer to Table 4)	●	
Object Class 13	13.0 - Benefits for former personnel (refer to Table 4)	●	
Overtime	Overtime pay excluded from Object Class 11	●	
Training	Individual training costs reported by organizations	●	
First Pay Date	First day of the first pay period in the study date range	●	
Last Pay Date	First day of the last pay period in the study date range	●	
Pay Periods	Number of pay periods recorded for an individual	●	
Contract Type	Cost Plus Fixed Fee; Cost Reimbursable, Fixed Price, Other		●
Government Space	Government furnished space provided (Yes; No; Partial)		●
Government Equip.	Government equipment provided (Yes; No)		●
Costing Option	Contractor FTE calculation option (refer to Table 8)		●

The CAPE ID variable is the key linkage between civilian and contractor data. We make comparisons between civilian and contractor costs only when the positions share the same CAPE ID, which signifies that positions meet the minimum criteria defined for comparable positions.

3. Case Studies

In this section, we present results of 17 case studies comparing fully burdened costs of government civilians and contractors at different organizations. We combine civilian and contractor cost data from all organizations into a single dataset for subsequent analysis. We standardize data fields to facilitate cross-organizational queries using a number of variables, including: organization, functional group, occupational series, and location. We present functional comparisons by organization. We impose a constraint that each comparison must contain at least one civilian FTE and at least one contractor FTE at the same location and that they are employed for a full year.

We retain all excluded data, particularly those without civilian or contractor equivalents at the same location, for potential comparisons with other organizations. Additionally, we did not conduct broader comparisons across organizations by normalizing locality pay for civilians to a particular location. It is less feasible to normalize contractor costs as it is much more difficult to untangle locality pay components in contract costs.

For each organization, we present a table to show the functional comparisons, identified by the most applicable position title. The distribution of civilian data arranged by occupational group or family is shown in Appendix B. We provide a cost ratio metric to compare civilian and contractor costs. The cost ratio indicator is presented as a standardized statistic of the relationship between the fully burdened costs of DoD civilians and contractors performing a comparable function. We present this in two ways throughout this report, depending on which cost type is higher. If civilian costs are greater than contractor costs, we calculate the cost ratio as the average cost of civilians divided by the average cost of contractors. Conversely, if contractor costs are greater than civilian costs, we calculate the cost ratio as the average cost of contractors divided by the average cost of civilians. Civilian position titles in the tables for each organization are sorted by cost ratio from lowest to highest. The number of civilian and contractor FTEs included in each comparison, rounded to the nearest integer, are displayed in columns adjacent to average costs.

As mentioned previously, this study does not evaluate efficiency or productivity. Data on overtime pay is presented for applicable organizations in the context of disclosing an additional civilian cost element that is excluded from the comparisons but is relevant to understanding the fully burdened cost of a DoD civilian. We do not use overtime pay to make inferences about efficiency or productivity, as we do not have data to measure output of goods or services. The overtime charts in the subsequent sections exclude functions with average annual overtime pay less than $500.

The civilian-contractor comparisons in this analysis do not represent the complete populations of each organization. Therefore, the number of employees employed at the end of fiscal year 2015 provides context for the proportion of employees that are included in the study. We do not provide counts for contractor populations since there are no available databases with accurate contractor FTE counts for entire organizations. Moreover, the process of constructing data for contractor FTEs limits the scope of collecting contractor data to contracts relevant to the study. Therefore, this section uses DoD

civilian counts as a proxy for the size of each organization from a civilian perspective with the understanding that contractor populations are rarely equivalent in size.

3.1. Medical

In this section, we review three medical facilities: Fort Belvoir Community Hospital, Naval Medical Center San Diego, and Tripler Army Medical Center. The objective of including DoD medical treatment facilities is to capture the functions from the Medical, Hospital, Dental, and Public Health civilian occupational group. The functions are described by proxy with civilian occupational groups, families, and series for consistency in terminology.

3.1.1. Fort Belvoir Community Hospital

Approximately 1,300 DoD civilians were employed at Fort Belvoir Community Hospital (FBCH) at the end of fiscal year 2015. FBCH initially identified 21 comparable functions with 345 civilian FTEs and 263 contractor FTEs for analysis. All civilians and contractors were employed in the National Capital Region at Fort Belvoir, Virginia. Civilians in this analysis are all employed under the General Schedule pay system.[17]

Description of Cost Comparisons

The comparable functions identified by FBCH are predominately from the Medical, Hospital, Dental and Public Health (0600) civilian occupational group as described by OPM. The Social Science, Psychology, and Welfare (0100) civilian occupational group is represented by Social Worker (0185) and Psychometrist (0180) occupational series. A total of 19 functions are in the final dataset that we use for comparisons as a result of data validation and exclusions. The largest occupational series in the FBCH dataset are Medical Support Assistants (0679), Clinical Nurses (0610), and Practical Nurses (0620) in descending order. The next largest occupational series, Medical Records Technician (0675), is separated into two subsets of comparable functions based on an assessment of functions performed within the organization. The two types of medical records technician are most noticeably differentiated by civilian pay grades of GS[redacted] and GS-[redacted]

Cost Comparisons

Table 10 and Table 11 display 19 comparable functions at FBCH, which are identified in the table by civilian position titles. Table 10 displays the comparisons in which civilians cost more than contractors; Table 11 displays the comparisons in which contractors cost more than civilians. Two functions are excluded from the table due a lack of comparable personnel in both the civilian and contractor categories with a full year of employment in 2015. The Medical Records Technician position title is shown in both tables because there are two separate functional comparisons. As seen

[17] General Schedule (GS) includes physicians and dentists, under the GP pay plan code, who are covered by the General Schedule classification system and GS base pay ranges and receive Title 38 market pay instead of locality pay.

in previous tables, duplicate position titles occur when more than one set of functions share common position titles or occupational series, but have different responsibilities, job duties, or expertise.

Table 10. Average cost of comparable positions at FBCH (Civilian $ > Contractor $)

Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CIV/CTR)
Medical Records Technician	(b)(4)				1.00
Health Technician					1.05
Physician (Psychiatry)					1.12
Medical Records Technician					1.13
Health Technician (Paramedic)					1.17
Social Worker					1.19

Table 11. Average cost of comparable positions at FBCH (Contractor $ > Civilian $)

Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CTR/CIV)
Clinical Nurse	(b)(4)				1.03
Pharmacy Tech					1.05
Practical Nurse					1.09
Physician (Allergy)					1.15
Diagnostic Radiology Technologist					1.17
Medical Support Assistant					1.19
Psychologist					1.22
Physician (Family Practice)					1.23
Diagnostic Radiology Technologist (Mammography)					1.27
Physician (Emergency Medicine)					1.34
Diagnostic Radiology Technologist (CT)					1.40
Physician (Internal Medicine)					1.42
Psychometrist					1.80

The cost ratios of comparable functions do not present a substantial trend in greater civilian or contractor costs. Of 19 comparable functions, 6 functions (or positions) have average civilian costs that are greater than the comparable contractor costs. For 4 out of 6 functions, civilian costs are more than 10 percent higher than contactor costs. Thirteen functions have average contractor costs that are greater than comparable civilian costs. For 10 out of 13 functions, contractor costs are more than 10 percent higher than civilian costs. In Table 10, the highest cost ratios, which correspond to civilian occupational series of Social Worker (0185) and Paramedic Health Technician (0640), indicate that these civilian costs are 19 percent and 17 percent greater than contractor costs on average. In Table 11, the function of Psychometrist (0180) has the highest cost ratio with contractor costs averaging 80 percent greater than civilian costs.

As described in Section 2.3, overtime pay is excluded from the civilian fully burdened costs to make civilian FTEs comparable to the contractor FTEs using standard annual hours. We present overtime statistics separately in this report solely to provide context for the scale of this excluded cost element.

Figure 2 displays the average overtime pay for functions at FBCH. The chart represents the average amount of overtime pay by function and excludes functions with average annual overtime pay values less than $500. The civilian overtime pay values include data for individuals who did not receive overtime. At FBCH, 102 out of 345 civilians in this analysis received some overtime pay in 2015. Social workers received the highest overtime pay, averaging approximately $15,000.

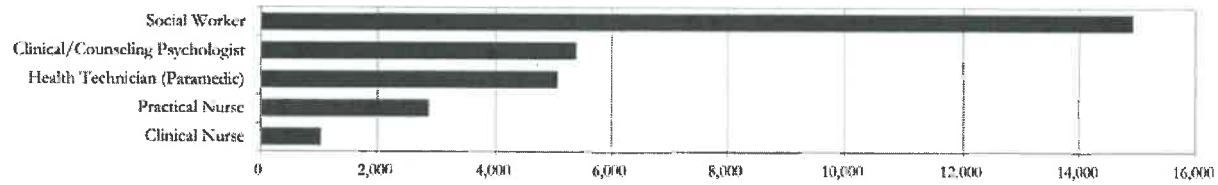


Figure 2. FBCH: Average 2015 annual overtime compensation ($)

3.1.2. Naval Medical Center San Diego

Approximately 2,224 DoD civilians were employed at Navy Medical Center San Diego (NMCSD) at the end of fiscal year 2015. NMCSD identified 17 comparable functions with 396 civilian FTEs and 353 contractor FTEs for analysis. All civilians and contractors were employed in San Diego, California. Civilians included in this analysis from NMCSD are all employed under the General Schedule pay system.

Description of Cost Comparisons

The comparable functions identified by NMCSD are predominately from the Medical, Hospital, Dental and Public Health (0600) civilian occupational groups. Additionally, individuals within the Clinical Psychologist (0180) and Health Physicist (1306) occupational series represent the Social Science, Psychology, and Welfare (0100) and Physical Sciences (1300) civilian occupational groups. All 17 functions are in the final dataset that we use for comparisons. The largest occupational series in the NMCSD dataset are Health Technician (0640), Pharmacy Technician (0661), and Vocational Nurses (0620) in descending order.

Cost Comparisons

Table 12 and Table 13 display the 17 comparable functions identified by NMCSD. It is worth noting that each organization provided the final assessment of comparable functions based on guidance provided by OSD(CAPE). Therefore, the same comparable functions may not align across medical centers based on the duties being performed at each location.

Table 12. Average cost of comparable positions at NMCSD (Civilian $ > Contractor $)

Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CIV/CTR)
Dentist	(b)(4)				1.02
Physical Therapist					1.10
Pharmacist					1.10
Diagnostic Radiologic Technician (MRI)					1.11
Nurse Specialist (Case Manager)					1.17
Pharmacy Technician					1.19
Clinical Nurse					1.23
Medical Technologist					1.23
Health Technician					1.31
Medical Technologist (Phlebotomist)					2.05

Table 13. Average cost of comparable positions at NMCSD (Contractor $ > Civilian $)

Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CTR/CIV)
Physician (Radiology)	(b)(4)				1.02
Health Physicist					1.03
Clinical Psychologist					1.05
Vocational Nurse					1.05
Physician (Internal Medicine)					1.27
Health Technician (Physical Therapy)					1.27
Respiratory Therapist					1.59

The cost ratios of comparable functions trend moderately towards higher civilian costs. Of 17 comparable functions, 10 functions (or positions) have average civilian costs that are greater than the comparable contractor costs. For 9 out of 10 functions with higher civilian costs, the civilian costs are at least 10 percent greater than contactor costs. Seven functions have average contractor costs that are greater than comparable civilian costs. For 3 out of 7 functions, contractor costs are more than 10 percent greater than civilian costs. In Table 12, the highest cost ratios are seen with positions that correspond to the civilian occupational series of Health Technicians (0640) and Medical Technologists (0644), with average civilian costs that are 31 percent and 105 percent greater than average contractor costs, respectively. In Table 13 , the function of Respiratory Therapists (0651) has the highest cost ratio with contractor costs averaging 59 percent greater than civilian costs.

Figure 3 displays the average overtime pay for functions at NMCSD. The overtime chart represents the average amount of overtime pay by function for all individuals, regardless of whether they received overtime pay. Functions that average less than $500 in overtime pay are excluded from Figure 3. As with FBCH, overtime is not a significant component in the total fully burdened cost to the government for the majority of civilians at NMCSD. Out of 396 civilians in this analysis, 97 received some overtime pay in 2015. Civilians within the Diagnostic Radiologic Technician (MRI) functional area received the highest overtime pay, averaging over $10,000.

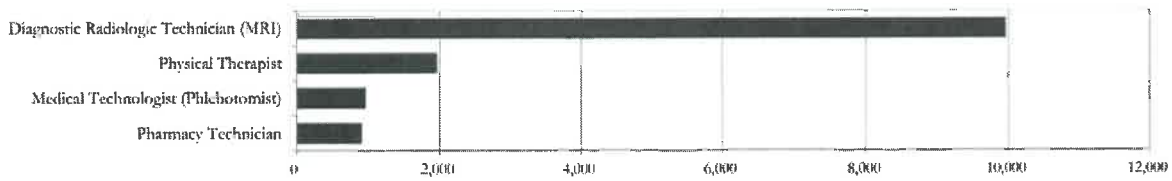


Figure 3. NMCSD: Average 2015 annual overtime compensation ($)

3.1.3. Tripler Army Medical Center

Approximately 1,853 DoD civilians were employed at Tripler Army Medical Center (TAMC) at the end of fiscal year 2015. TAMC identified 32 comparable functions with 800 civilian FTEs and 161 contractor FTEs for analysis. All civilians and contractors were employed in Hawaii for the period of this analysis. Civilians included in this analysis from TAMC are all employed under the General Schedule pay system.

Description of Cost Comparisons

The comparable functions identified by TAMC are predominately from the Medical, Hospital, Dental, and Public Health (0600) civilian occupational groups. Additionally, the Social Science, Psychology, and Welfare (0100), General Administrative, Clerical, and Office Services (0300), Accounting and Budget (0500), and Information Technology (2200) civilian occupational groups are represented in the comparisons. All 32 functions are in the final dataset that we use for comparisons. The largest occupational series in the Tripler Army Medical Center dataset are Clinical Nurses (0610), Medical Support Assistants (0679), Practical Nurses (0620), and Nursing Assistants (0620), in descending order.

Cost Comparisons

Table 14 and Table 15 display the 32 comparable functions identified by TAMC. As seen in previous tables, duplicate position titles occur when more than one set of functions share common position titles or occupational series, but have different responsibilities, job duties, or expertise. In this case, we see examples of duplicate position titles for personnel performing IT Specialist (2210) and Medical Records Technician (0675) functions and for clinical nurses specializing in obstetrics and gynecology (OB-GYN).

Table 14. Average cost of comparable positions at TAMC (Civilian $ > Contractor $)

Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CIV/CTR)
Nurse (APRN) Anesthetist	(b)(4)				1.00
Clinical Nurse (Emergency)					1.01
Clinical Nurse (Perioperative)					1.02
Clinical Nurse (Critical Care)					1.06
Clinical Nurse (Medical-Surgical)					1.07
Clinical Nurse (OB-GYN)					1.07

Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CIV/CTR)
Clinical Nurse (OB-GYN)	(b)(4)				1.15
Physician (General Surgery)					1.35

Table 15. Average cost of comparable positions at TAMC (Contractor $ > Civilian $)

Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CTR/CIV)
Pharmacy Technician	(b)(4)				1.00
Nursing Assistant					1.04
IT Specialist					1.11
IT Specialist					1.16
Physician (Anesthesiology)					1.16
Social Worker (Clinical)					1.17
Medical Support Assistant					1.17
Medical Records Technician					1.20
Medical Insurance Technician (OA)					1.22
Dietitian					1.23
Practical Nurse					1.23
Clinical Nurse (Case Management)					1.25
Health Technician (Ophthalmology)					1.25
Health System Assistant (OA)					1.25
Medical Records Technician					1.25
Diagnostic Radiologic Technologist					1.30
Clinical Psychologist					1.33
Pharmacist					1.34
Emergency Medical Technician					1.34
Physician (Psychiatry)					1.37
Physician (Neurosurgery)					1.40
Operating Room Nursing Assistant					1.41
Physician (Obstetrics/Gynecology)					1.52
Health System Specialist					1.63

In this case study, the cost ratios of comparable functions trend moderately towards higher civilian costs. Of 32 comparable functions, 8 functions (or positions) have average civilian costs that are greater than the comparable contractor costs and 24 functions have average contractor cost that are greater than the comparable civilian costs. Of the comparisons with greater civilian costs, 2 out of 8 have average civilian costs that are more than 10 percent greater than average contractor costs. Of the comparisons with greater contractor costs, 22 out of 24 have average contractor costs that are more than 10 percent greater than average civilian costs.

In Table 14, General Surgery Physicians (0602) have the highest cost ratios, with civilians being 35 percent more expensive than comparable contractors. In Table 15, the highest cost ratios exist for positions that correspond to the occupational series of Obstetrics & Gynecology Physician (0602) and

Health System Specialist (0671), but both series consist of a limited number of contractor FTEs. The contractor costs are 52 percent and 63 percent greater than civilian costs for these comparisons respectively. Of note is that, with the exception of Clinical Case Management Nurses, Clinical Nurses, have greater civilian costs in this sample.

Figure 4 displays the average overtime pay for functions at TAMC. The overtime chart represents the average amount of overtime pay by function and excludes functions with average overtime pay values less than $500. As with the previous medical facilities in this section, overtime pay is not a significant component in the total fully burdened cost for the majority of civilians at TAMC. Out of 800 civilians in this analysis, 308 received some overtime pay in 2015. OB-GYN clinical nurses are represented in two separate comparison groups due to experience and expertise. The higher grade level received the highest overtime pay, averaging more than $14,000 for those who received payments.

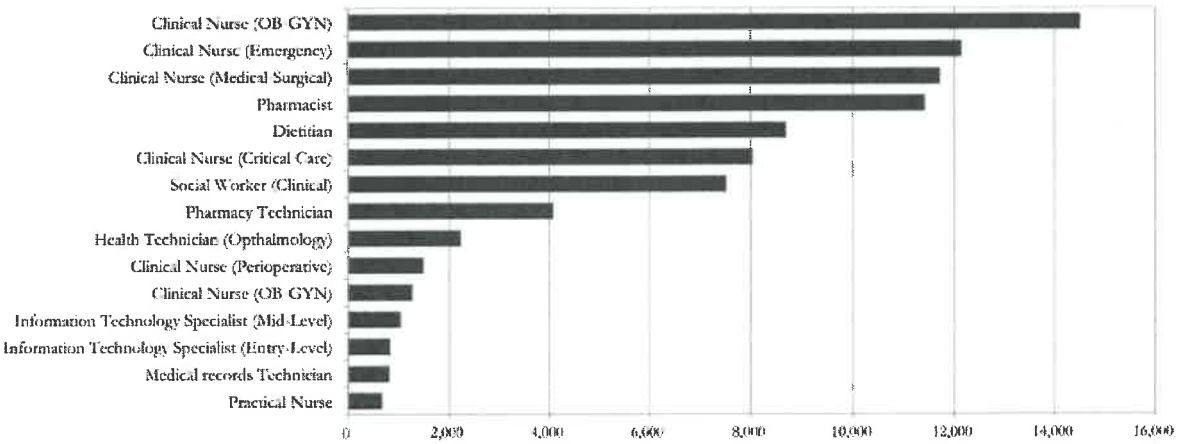


Figure 4. TAMC: Average 2015 annual overtime compensation ($)

3.2. Logistics and Depots

In this section, we review five organizations in the logistics and depot category: Anniston Army Depot, Fleet Readiness Center Southwest, Ogden Air Logistics Center, Air Force Life Cycle Management Center, and the Defense Logistics Agency. The objective of including these organizations is to capture data for logistics, supply, and transportation occupational groups and as many trade, craft, or labor job families as possible. With all organizations, we retain any qualifying civilian-contractor comparisons; therefore, this section also includes a large cross-section of functions unrelated to logistics and depot activities. As before, the functions are described using civilian occupational groups, families, and series for consistency in terminology.

3.2.1. Anniston Army Depot

Approximately 2,681 DoD civilians were employed by Anniston Army Depot (AAD) at the end of fiscal year 2015. Anniston Army Depot initially identified 5 comparable functions with 47 civilian

FTEs and 51 contractor FTEs for analysis. All civilians and contractors were employed in Anniston, Alabama for the period of this analysis. With one exception in the General Schedule pay system, all civilians are employed under the Federal Wage System.

Description of Cost Comparisons

The comparable functions identified by AAD are all from the Transportation/Mobile Equipment Maintenance (5800) civilian labor family. Two of the five functions are in the final dataset that we use for comparisons. We excluded three functions because contractor equivalents do not exist that meet the criteria for comparable functions. The civilian data is retained in the database for potential comparisons with contractors at different organizations and locations.

Cost Comparisons

Table 16 displays the 2 comparable functions identified by AAD. The three excluded functions are Executive Assistant (0303), Heavy Mobile Equipment Mechanic (5803) and Heavy Equipment Mechanic Supervisor (5803). Each of these is excluded because AAD was unable to identify contractors who perform comparable work as defined in Section 2.2.

Table 16. Average cost of comparable positions (Anniston Army Depot)

Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CTR/CIV)
Heavy Mobile Equipment Repairer	(b)(4)				1.58
Heavy Mobile Equipment Mechanic Leader					1.99

As depicted by the cost ratios, the average cost for civilians is significantly lower than comparable contractors for both functions. The average fully burdened cost of a Heavy Mobile Equipment Mechanic Leader function performed by a contractor is 99 percent higher than the average civilian cost.

Civilians in both functions receive a significant amount of overtime pay. As described in Section 2.3, overtime is excluded from the civilian fully burdened costs in Table 16 to make it comparable to the contractor FTEs using standard annual hours. The average annual overtime payments for the civilian heavy equipment repairers and mechanic leaders included in this analysis are $19,358 and $24,603 respectively.

3.2.2. Fleet Readiness Center Southwest

Approximately 2,693 DoD civilians were employed at Fleet Readiness Center Southwest (FRCSW) at the end of fiscal year 2015. FRCSW initially identified 49 comparable functions with 1,284 civilian FTEs and 492 contractor FTEs for analysis. Civilians and contractors were employed at the following locations for the period of this analysis: San Diego, California; Naval Air Station Whidbey Island, Washington; Marine Corps Air Station Yuma, Arizona; and Naval Air Station Lemoore, California. Civilians included in this analysis from Fleet Readiness Center Southwest are employed either under the General Schedule pay system or the Federal Wage System.

Description of Cost Comparisons

The comparable functions identified FRCSW are predominately from the Engineering and Architecture (0800) and General Administrative, Clerical, and Office Services (0300) civilian occupational groups, and the Metal Work (3800) and Aircraft Overhaul (8800) civilian job families. Additionally, the Business and Industry (1100) and Information Technology (2200) civilian occupational groups are represented as well as several other civilian job families such as Electronic Equipment Installation and Maintenance (2600), Electrical Installation and Maintenance (2800), Instrument Work (3300), and Machine Tool Work (3400).

A total of 22 functions are in the final dataset that we use for comparisons as a result of data validation and exclusions. The largest occupational series represented in the FRCSW dataset are Sheet Metal Mechanic (3806), Aircraft Mechanic (8852), and Aircraft Electrician (2892) respectively in descending order.

Cost Comparisons

Table 17 and Table 18 display 26 comparisons of 22 functions identified by Fleet Readiness Center Southwest. Four sets of functions are comparable to each other, but are separated by location. The primary reason for functions being excluded from this table is lack of comparable functions in the same location. As with previous case studies, duplicate position titles appear when more than one set of functions share a common position title or occupational series, but have different responsibilities, job duties, or levels of expertise.

Table 17. Average cost of comparable positions at FRCSW (Civilian $ > Contractor $)

Location	Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CIV/CTR)
San Diego	Precision Measurement Equipment Calibrator	(b)(4)				1.02
San Diego	Sheet Metal Mechanic					1.03
Whidbey Island	Sheet Metal Mechanic					1.04
San Diego	Production Control					1.06
San Diego	Machinist					1.13

Table 18. Average cost of comparable positions at FRCSW (Contractor $ > Civilian $)

Location	Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CTR/CIV)
San Diego	Pneudraulic Systems Mechanic	(b)(4)				1.00
San Diego	Electronics Mechanic					1.02
San Diego	Sheet Metal Mechanic					1.03
San Diego	Administrative Support Assistant (OA)					1.04
San Diego	Electroplater (Mid-Level)					1.06
San Diego	Aircraft Electrician					1.06
San Diego	Aircraft Mechanic					1.06
San Diego	Pneudraulic Systems Mechanic					1.07
San Diego	Aircraft Ordnance Systems Mechanic					1.08

Location	Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CTR/CIV)
San Diego	Welder	(b)(4)				1.08
San Diego	Aircraft Mechanic					1.10
San Diego	Electronics Mechanic					1.10
San Diego	Aircraft Launch And Arrest Devices Mechanic					1.10
Yuma	Aircraft Mechanic					1.11
Whidbey Island	Aircraft Electrician					1.12
San Diego	Aircraft Electrician					1.13
San Diego	Logistics Management Specialist					1.17
Yuma	Sheet Metal Mechanic					1.19
San Diego	Production Control					1.28
San Diego	Heat Treater And Temperer					1.37
San Diego	Electroplater (Entry)					1.49

The average costs for civilians are relatively equivalent to contractors performing comparable functions at Fleet Readiness Center Southwest. Of 26 comparisons, 5 functions (or positions) have average civilian costs that are greater than the comparable contractor costs and 21 functions have average contractor cost that are greater than the comparable civilian costs. Only one out of five comparisons with greater civilian costs has average civilian costs that are more than 10 percent greater than average contactor costs. Of the comparisons with greater contractor costs, 8 out of 21 have average contractor costs that are more than 10 percent greater than average civilian costs. Seventeen out of 26 comparisons are within 10 percent of a difference between average civilian and contractor costs.

In Table 17, the only comparison with average civilian costs that is more than 10 percent greater than the average contractor cost is for positions that correspond to the Machinist (3414) occupational series. On average, civilian machinists cost 13 percent more than comparable contractors. In Table 18, the highest cost ratio exists for one Electroplater (3711) function; however, electroplaters with mid-level expertise have similar civilian and contractor costs. In this case, more civilians are categorized in the mid-level electroplater group, while more contractors are categorized as entry or junior level. Production Control (1152) and Heat Treater and Temperer (3712) have average contractor costs that are 28 percent and 37 percent greater than civilian costs respectively. As with the Electroplater function, the Production Control function is categorized by mid-level and entry positons with the junior positions accounting for the most noticeable disparity in cost.

As with some other organizations, DoD civilians at FRCSW earn a significant amount of overtime pay. Figure 5 depicts average overtime pay in 2015 and shows that for 14 position titles, average overtime pay exceeded $10,000. Civilians in 8 positions earned, on average, more than $20,000 in overtime pay, while for 2 functions, civilian employees' overtime pay averaged $35,000 or more. The civilian overtime pay chart excludes functions with average overtime values less than $500 and the average includes data for individuals who did not receive overtime pay.

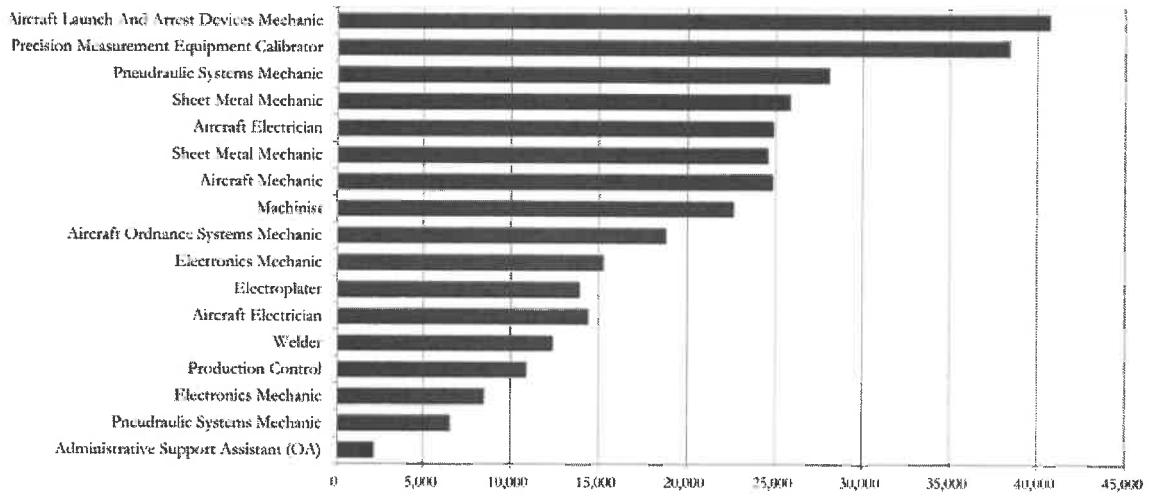


Figure 5. FRC-SW: Average 2015 annual overtime compensation ($)

3.2.3. Ogden Air Logistics Center

Approximately 8,600 DoD civilians were employed with Ogden Air Logistics Center (OO-ALC) at the end of fiscal year 2015. OO-ALC initially identified 45 comparable functions with 1,244 civilian FTEs and 442 contractor FTEs for analysis. Civilians and contractors were employed at Hill Air Force Base, Utah, and Davis-Monthan Air Force Base, Arizona for the period of this analysis. Civilians included in this analysis from OO-ALC are employed either under the General Schedule pay system or the Federal Wage System.

Description of Cost Comparisons

The comparable functions identified within OO-ALC are predominately from the Business and Industry (1100), General Administrative, Clerical, and Office Services (0300), and Quality Assurance, Inspection, and Grading (1900) civilian occupational groups, and the Electronic Equipment Installation and Maintenance (2600), Metal Work (3800), and Aircraft Overhaul (8800) civilian job families. Several other civilian occupational groups and job families are included in the Ogden Air Logistics Center comparisons.

A total of 37 functions are included in the final dataset that we use for comparisons as a result of data validation and exclusions. In identifying comparable functions, OO-ALC distinguishes between locations; therefore, some functions are equivalent in terms of jobs being performed and could be merged if normalized by a single locality pay scale. The largest occupational series in the OO-ALC dataset are Production Supply Technician (1152), Quality Assurance (1910), and two types of Aircraft Mechanic (3806/8852).

Cost Comparisons

Table 19 and Table 20 display 37 comparable functions identified by OO-ALC. Duplicate position titles occur when more than one set of functions share common position titles or occupational series, but have different responsibilities, job duties, or expertise. Functions are excluded from this table if there are not comparable civilian and contractor functions in the same location or if either side of the comparison does not have full annual payment data.

Table 19. Average cost of comparable positions at OO-ALC (Civilian $ > Contractor $)

Location	Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CIV/CTR)
Hill AFB	Aircraft Mechanic III (Machinist)	(b)(4)				1.05
Hill AFB	Painter/Blaster					1.05
Hill AFB	Painter (Coater)					1.05
Davis-Monthan AFB	Database Management Specialist					1.07
Hill AFB	Aircraft Mechanic II (Sheet metal)					1.07
Hill AFB	Aircraft Mechanic II (Fuels)					1.07
Hill AFB	Electronic Technician II					1.09
Davis-Monthan AFB	Aircraft Worker					1.12
Hill AFB	Courseware Developer/Trainer					1.13
Hill AFB	Electronic Technician III					1.13
Davis-Monthan AFB	Aircraft Painter					1.14
Hill AFB	Production Supply Technician					1.17
Hill AFB	Aircraft Mechanic II (Machinist)					1.21
Hill AFB	Production Planner					1.23
Hill AFB	Aircraft Mechanic III (Sheet metal)					1.29
Hill AFB	Aircraft Mechanic III (General)					1.31
Hill AFB	Aircraft Mechanic III (NDI Tech)					1.34
Hill AFB	Aircraft Mechanic III (Machinist)					1.37
Hill AFB	Production Supply Technician					1.74
Hill AFB	Production Supply Technician					2.00
Davis-Monthan AFB	Woodworker					2.02

Table 20. Average cost of comparable positions at OO-ALC (Contractor $ > Civilian $)

Location	Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CTR/CIV)
Hill AFB	Aircraft Mechanic II (Sheet metal)	(b)(4)				1.02
Hill AFB	Aircraft Mechanic II (Sheet metal)					1.06
Hill AFB	Master Analyst					1.10
Hill AFB	Aircraft Mechanic II (General)					1.13
Hill AFB	Aircraft Mechanic II (General)					1.13
Hill AFB	Production Planner					1.24
Hill AFB	Electronic Technician III					1.24
Hill AFB	Journeyman Electrician					1.25
Hill AFB	Quality Assurance					1.30
Hill AFB	Quality Assurance					1.42

Location	Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CTR/CIV)
Hill AFB	Analytical Consultant II	(b)(4)				1.42
Hill AFB	Production Analyst/Senior Analyst					1.49
Hill AFB	Program Manager					2.10
Hill AFB	Analytical Consultant					2.14
Hill AFB	Industrial/Manufacturing Engineer					3.01
Hill AFB	Engineer					4.16

An evaluation of the cost ratios at OO-ALC certainly presents some outliers, but does not suggest a prevailing trend in lower costs for civilians or contractors performing comparable functions. Of 37 comparisons, 21 functions (or positions) have average civilian costs that are greater than the comparable contractor costs and 16 functions have average contractor costs that are greater than the comparable civilian costs. In Table 19, 14 out of 21 comparisons with greater civilian costs have average civilian costs that are at least than 10 percent greater than average contactor costs. Of the comparisons with greater contractor costs in Table 20, 14 out of 16 have average contractor costs that are at least 10 percent greater than average civilian costs. Nine out of 37 comparisons from OO-ALC have less than 10 percent of a difference between average civilian and contractor costs.

Woodworkers have the highest cost ratio in Table 19 with an average civilian cost that is 102 percent more than the average contractor cost. Two of the comparisons for Production Supply Technician positions have at least 74 percent higher civilian costs. The highest cost ratios in Table 20, in which contractors are more expensive than civilians, are for Engineer (0806), Industrial/Manufacturing Engineer (0896), Analytical Consultant (0301), and Program Manager (0301).[18] The aforementioned engineering functions have average contractor costs that are 201 percent and 316 percent greater than comparable civilians, respectively. Likewise, the civilian analytical consultant and program manager positions, both within the Miscellaneous Administration and Program Series, have average contractor costs that are more than 100 percent greater than civilian costs. All of the Aircraft Mechanic (3414/3705/3806/8852) positions have civilian costs that are either equivalent (within 10 percent) or greater than the comparable contractor costs.

DoD civilians at OO-ALC also earn a significant amount of overtime pay. Figure 6 depicts the average annual overtime pay for 26 functions in 2015. The civilian overtime chart excludes functions with average overtime pay values less than $500 and the average includes data for individuals who did not receive overtime pay. This graph shows that for 9 functions, the average overtime pay was more than $10,000. Civilians in 3 functions earned, on average, more than $20,000 in annual overtime pay. The highest civilian overtime values are seen with Sheet Metal Aircraft Mechanics, Aircraft Painters, Machinist Aircraft Mechanics, and Electronic Technicians.

[18] Journeyman Electrician (2854) is classified as an outlier in this study that requires further investigation of contract structures.

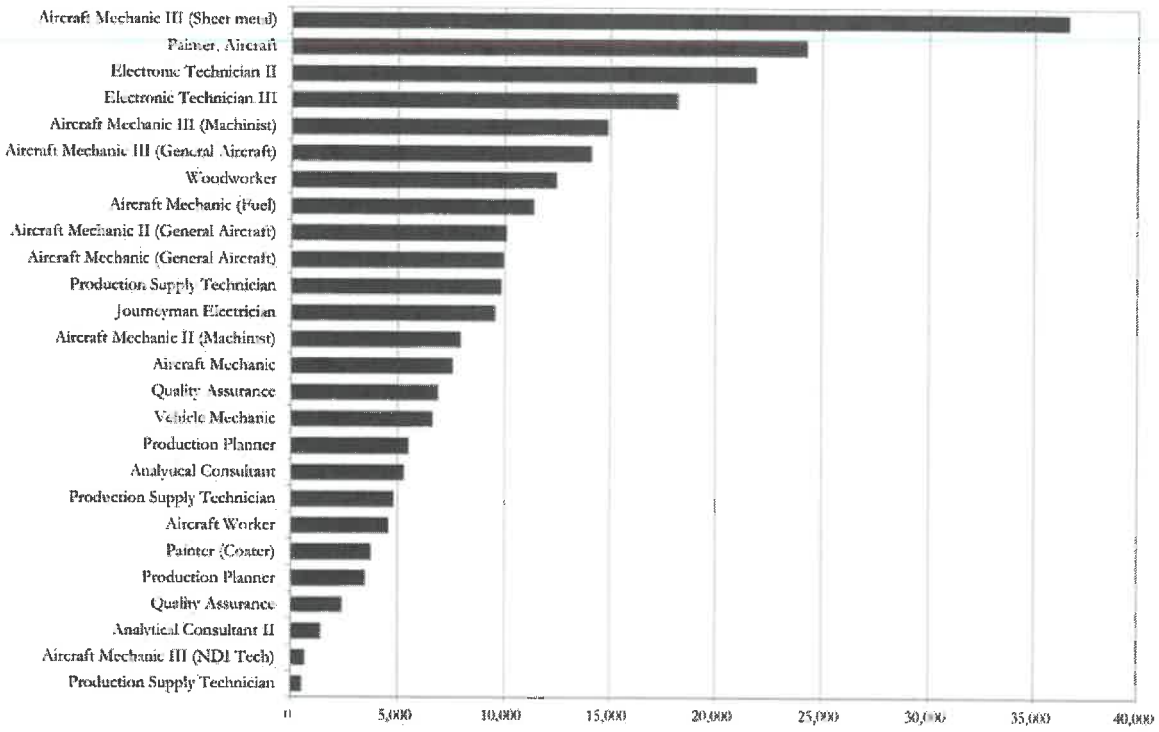


Figure 6. OO-ALC: Average 2015 annual overtime compensation ($)

3.2.4. Air Force Life Cycle Management Center

A total of 15,153 DoD civilians were employed with Air Force Life Cycle Management Center (AFLCMC) at the end of fiscal year 2015. Approximately 1,175 DoD civilians in AFLCMC were employed at Hill Air Force Base. AFLCMC identified 15 comparable functions with 980 civilian FTEs and 102 contractor FTEs for analysis. All civilians and contractors in this study were employed at Hill Air Force Base, Utah for the period of this analysis. AFLCMC civilians in this analysis are all employed under the General Schedule pay system.

Description of Cost Comparisons

The majority of comparable functions identified within AFLCMC are from the General Administrative, Clerical, and Office Services (0300), Engineering and Architecture (0800), and Equipment, Facilities, and Services (1600) civilian occupational groups. Several other civilian occupational groups are represented in the AFLCMC comparisons including Business and Industry (1100), Accounting and Budget (0500), and Supply (2000).

All 15 functions are in the final dataset that we use for comparisons after data validation and exclusions. The largest occupational series in the AFLCMC dataset are Logistics Management (0346), Equipment Services (1670), and Aerospace Engineering (0861). Some comparisons, particularly from the preceding list, have a larger share of civilians than contractors; whereas, many of the other comparisons have a more balanced distribution of civilians and contractors.

Cost Comparisons

Table 21 and Table 22 display 15 comparable functions identified by AFLCMC. Functions are excluded from this table if there are not comparable civilian and contractor functions in the same location or if either side of the comparison does not have a full annual payment. The civilian position titles used in both tables are not inclusive of all the position titles in each comparison. For example, the "Logistics Management/Lead Equipment Specialist" comparison includes some civilian personnel who have other position titles, such as Data Systems Management Specialist, Production Management Specialist, Equipment Specialist, and Supervisory Logistics Management Specialist. In total, this comparison line has (b)(4) civilians who perform comparable functions, as identified by AFLCMC, based on the criteria in Section 2.2.

Table 21. Average cost of comparable positions at AFLCMC (Civilian $ > Contractor $)

Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CIV/CTR)
Equipment Specialist/Program Analyst/Misc.	(b)(4)				1.03
Supervisory Engineer					1.04
Engineering Technician/Electronics Technician					1.08
IT Specialist					1.11
Logistics Management/Lead Equipment Specialist					1.15
Financial Management Analyst					1.16
Aerospace Engineer/Electronics Engineer					1.16
Supervisory Logistics Management Specialist					1.37
Acquisition Program Manager					1.39
Logistics Management Specialist/Program Analyst					1.87

Table 22. Average cost of comparable positions at AFLCMC (Contractor $ > Civilian $)

Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CTR/CIV)
Acquisition Program Manager/Logistics Management	(b)(4)				1.03
Supervisory Intelligence Specialist					1.05
Supervisory Financial Specialist					1.06
Security Specialist					1.10
IT Specialist/Computer Scientist					1.15

The distribution of the civilian-contractor cost ratios at AFLCMC reveals a moderate imbalance favoring higher civilian costs. Of 15 comparisons, 10 functions (or positions) have average civilian costs that are greater than the comparable contractor costs, and 5 functions have average contractor costs that are greater than the comparable civilian costs. Seven out of 10 comparisons in Table 21 have average civilian costs that are more than 10 percent greater than average contactor costs. Of the five comparisons in Table 22, only one comparison has average contractor costs that are more than 10 percent greater than average civilian costs. Seven out of 15 comparisons are within 10 percent of a difference between average civilian and contractor costs.

The largest cost ratio in Table 21, indicating higher civilian costs than contractor costs, is for Logistics Management Specialist/Program Analyst and comprises civilian personnel from three occupational series: Safety and Occupational Health Management (0018), Management and Program Analysis (0343), and Logistics Management (0346). The average civilian cost is 87 percent more than the average comparable contractor cost. The highest cost ratio in Table 22 is connected with comparable Information Technology (IT) Specialist/Computer Scientist functions. This comparison group includes civilians from three occupational series: Telecommunication (0391), Information Technology Management (2210), and Miscellaneous Administration and Management (0301) and has an average contractor cost that is 15 percent more than comparable civilians.

Figure 7 displays the average overtime pay for functions at AFLCMC. The civilian overtime chart excludes functions with average overtime values less than $500 and the average includes data for individuals who did not receive overtime pay. Overtime pay is not a significant component in the total fully burdened cost to the government for the majority of civilians at AFLCMC; however, 124 out of 980 civilians in this analysis received some overtime pay in 2015. Supervisory and Lead Logistics Management Specialists received the highest overtime pay, averaging more than $12,000 for (b)(full-year civilian employees; however, only (b)(4 of these employees received overtime pay, each at more than $100,000, which skews the average.

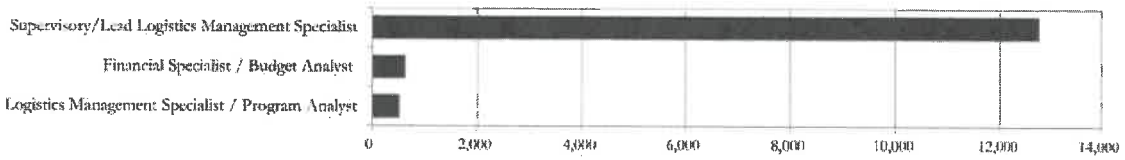


Figure 7. AFLCMC: Average 2015 annual overtime compensation ($)

3.2.5. Defense Logistics Agency

A total of 23,305 DoD civilians were employed with Defense Logistics Agency (DLA) at the end of fiscal year 2015. DLA provides logistics support in 48 states and 28 countries, and the agency's headquarters is at Fort Belvoir, Virginia. Since it operates in numerous CONUS and OCONUS locations, DLA provided access to organizations from three different types of activities to participate in the study: distribution depots; installation support; and child development centers.[19] The child development centers are discussed separately in Section 3.6 due to a different methodology used for analysis. For distribution and installation support functions, DLA initially identified 83 comparable functions with 368 civilian FTEs and 296 contractor FTEs for analysis. Civilians included in this analysis are employed under the General Schedule pay system and the Federal Wage System.

[19] DLA excluded organizations and personnel from the study using internal criteria more restrictive than the criteria directed by OSD(CAPE). DLA did not provide any civilian or contractor personnel data for DLA Headquarters due to a lack of comparable positions.

Description of Cost Comparisons

The activities and locations identified by DLA are shown in Table 23. The DLA facilities are somewhat unique in the context of our study because civilians and contractors are mostly separated by location. Therefore, there are limited options available for side-by-side comparisons of civilians and contractors at the same location performing similar functions. The four distribution depots are comparable with some having civilian workforces and others having contractor workforces. In terms of size, the distribution depot located in San Diego is classified by DLA as a large depot; whereas, the others are classified as medium depots. To make comparisons consistent with our methodology, we normalize civilian personnel costs to the comparable contractor locality. In this case, we adjust the locality pay for civilians in Table 23 to the location for the contractors in the same DLA Activity row.

Table 23. Location and manpower type of activities included in the DLA analysis[20]

	Employee Locations	
DLA Activity	Civilian	Contracted
Installation Support	Susquehanna	San Joaquin
Distribution Center	Tobyhanna	San Diego
Distribution Center	Corpus Christi	Cherry Point

The largest categories of comparable functions identified within DLA, using civilian occupational codes as a proxy, are from the Warehousing and Stock Handling (6900) occupational family and the Supply (2000) occupational group. A total of 24 civilian occupational groups and families are in the DLA comparisons, including Transportation/Mobile Equipment Maintenance (5800), Transportation/Mobile Equipment Operation (5700), General Administrative, Clerical, and Office Service (0300), and General Maintenance and Operations Work (4700) occupational groups and families.

A total of 44 functions are in the final dataset that we use for comparisons after data validation and exclusions. We make 49 separate comparisons based on combinations of function and location. The largest civilian occupational series in the DLA dataset is Miscellaneous Warehousing & Stock Handling (6901). Personnel from this series are identified in the next subsection by multiple position titles; most commonly, they are labeled as Distribution Process Worker and General Supply Specialist. There is at least one comparison in each of 52 additional occupational series, including Supply Clerical and Technician (2005), Heavy Mobile Equipment Mechanic (5803), and Materials Examining and Identifying (6912) as the next largest occupational series.

Cost Comparisons

Table 24 and Table 25 display 49 comparisons of functions by location in our analysis of DLA personnel data. The location variable represents the location of the contractor side of the civilian-contractor comparison after the civilian personnel costs are adjusted by locality. Civilian locality pay is adjusted to the contractor location based on OPM 2015 General Schedule Locality Pay Tables. For

[20] Analysis for DLA Child Care Development (CDC) Centers is presented in Section 3.6.

example, civilians at Susquehanna Depot received locality pay for the Washington-Baltimore-Northern Virginia area locality (24.22 percent). We adjust their locality pay to match the San Jose-San Francisco-Oakland area locality (35.15 percent). Functions are excluded from this table if there are not comparable civilian and contractor functions that can be normalized to the same location or if either side of the comparison does not have full annual payments. In some instances, civilian position titles used in Table 24 and Table 25 are not inclusive of all position titles in the comparison. The civilian position titles are used as a descriptive reference, and may include individuals with different occupational series codes or job titles.

Table 24. Average cost of comparable positions at DLA (Civilian $ > Contractor $)

Location[21]	Civilian Position Title	Civilian ($)[22]	n	Contractor ($)	n	Cost Ratio (CIV/CTR)
Cherry Point	Motor Vehicle Operator (Tractor Operator)	(b)(4)				1.00
San Diego	Safety and Occupational Health Specialist					1.02
San Joaquin	Facility Operations Manager					1.02
San Joaquin	Motor Vehicle Operator					1.03
Cherry Point	Distribution Process Worker					1.03
San Joaquin	Tools and Parts Attendant					1.03
Cherry Point	General Supply Specialist					1.04
San Diego	Materials Handler/Distribution Process Leader					1.05
San Joaquin	Mail and File Clerk					1.05
San Joaquin	Heavy Mobile Equipment Mechanic					1.05
San Joaquin	Work Order Technician/Production Controller					1.07
San Diego	Wood Worker					1.08
Cherry Point	Supervisor Distribution Facilities Specialist					1.08
San Joaquin	Supply Technician					1.13
San Diego	Transportation Assistant					1.14
San Diego	Motor Vehicle Operator (Fork Lift Operator)					1.16
San Joaquin	Boiler Plant Operator					1.16
San Joaquin	Facility Operations Manager					1.19
Cherry Point	Materials Examiner and Identifier					1.20
San Joaquin	Roofer					1.22
Cherry Point	Supply Systems Analyst/Management Specialist					1.24
San Diego	Materials Handler Supervisor/Distribution Process Worker Supervisor					1.28
San Diego	Distribution Process Worker Supervisor					1.29
Cherry Point	Program Analyst					1.34
San Diego	Supervisory Traffic Management					1.36
San Joaquin	Gardener					1.37

[21] DLA locations represent the contractor side of the civilian-contractor comparisons.
[22] Civilian locality pay is adjusted to the contractor location based on U.S. Office of Personnel Management 2015 General Schedule Locality Pay Tables.

Table 25. Average cost of comparable positions at DLA (Contractor $ > Civilian $)

Location[23]	Civilian Position Title	Civilian ($)[24]	n	Contractor ($)	n	Cost Ratio (CTR/CIV)
Cherry Point	Administrative Support Assistant	(b)(4)				1.00
San Joaquin	Material Expediter					1.02
San Joaquin	Painter					1.02
San Diego	Packer					1.03
Cherry Point	Supply Technician/General Supply Specialist					1.04
Cherry Point	Distribution Process Worker Leader					1.04
San Joaquin	Heavy Mobile Equipment Mechanic					1.05
San Joaquin	Pest Controller					1.05
San Diego	Supply Technician					1.06
San Joaquin	Air Conditioning Equipment Mechanic					1.06
San Joaquin	Carpenter (Mason)					1.07
San Joaquin	Plumber					1.11
San Diego	Distribution Process Worker					1.15
San Diego	Materials Examiner and Identifier					1.16
San Joaquin	Program Analyst					1.17
Cherry Point	Distribution Process Worker					1.18
Cherry Point	Distribution Process Worker					1.23
San Diego	Security Specialist					1.24
San Joaquin	Electronic Industrial Controls					1.29
San Joaquin	Electrician					1.30
San Diego	Supply Systems Analyst					1.53
San Joaquin	Wastewater Treatment Plant Operator					1.64
San Joaquin	Boiler Plant Equipment Mechanic					1.76

The distribution of the civilian-contractor cost ratio at selected DLA organizations shows that fully burdened costs are mostly higher for civilians than contractors. Of 49 comparisons, 26 functions (or positions) have average civilian costs that are greater than the comparable contractor costs and 23 functions have average contractor costs that are greater than the comparable civilian costs. Thirteen comparisons in Table 24 have average civilian costs that are more than 10 percent greater than average contactor costs. Twelve comparisons in Table 25 have average contractor costs that are more than 10 percent greater than average civilian costs.

The largest comparison groups in both tables are the Distribution Process Worker (6901) functions. The comparison in Table 24 has a civilian-to-contractor cost ratio of 1.03 and includes (b)(civilian FTEs from Corpus Christi and (b)(contractor FTEs from Cherry Point. The comparison in Table 25 has a contractor-to-civilian cost ratio of 1.15 and includes (b)(4 ivilian FTEs from Tobyhanna and (b)(4) contractor FTEs from San Diego.

[23] DLA locations represent the contractor side of the civilian-contractor comparisons.

[24] Civilian locality pay is adjusted to the contractor location based on U.S. Office of Personnel Management 2015 General Schedule Locality Pay Tables.

The highest cost ratios in Table 24 are for civilian personnel from Supervisory Traffic Management (2130) and Gardener (5003) occupational series. The cost ratios of 1.36 and 1.37 indicate that average civilian costs are 36 percent and 37 percent greater than average contractor costs, respectively. The highest cost ratios in Table 25 are associated with Supply Systems Analyst (2003), Wastewater Treatment Operator (5408) and Boiler Plant Equipment Mechanic (5309) functions. With cost ratios of 1.53, 1.64 and 1.76, these are the only comparisons from either table with greater than 50 percent of a difference between average civilian and contractor costs.

Figure 8 shows the average overtime pay of the functions that we reviewed within DLA. The civilian overtime pay chart excludes functions with average overtime pay values less than $500 and the average includes data for individuals who did not receive overtime pay. The majority of the DoD civilians in this sample group earn overtime pay. In total, 288 out of 368 civilian personnel received some overtime pay. As with all organizations in this analysis, we do not include the overtime pay for civilians in the fully burdened costs in Table 24 and Table 25. Moreover, Figure 8 is intended to acknowledge an additional payment category that may be accounted for in other civilian cost estimates outside of the framework of this study, but is not relevant to a comparison in which we control for working hours.

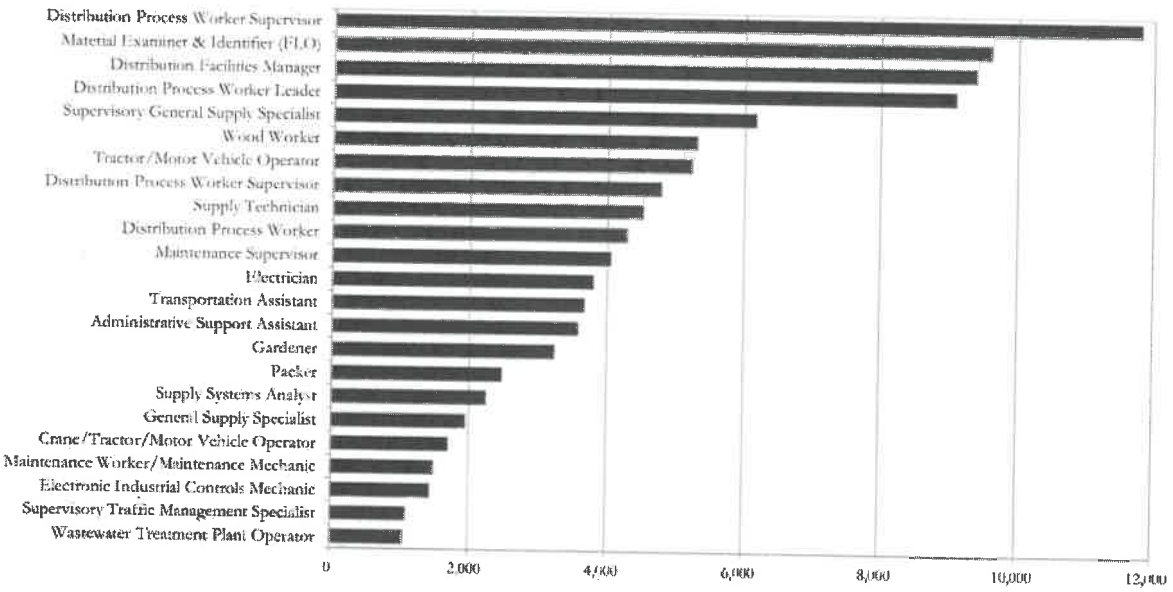


Figure 8. DLA: Average 2015 annual overtime compensation ($)

The civilian function with the highest average overtime pay, at $11,814, is Distribution Process Worker Supervisor, which includes personnel from the Distribution Facilities and Storage Management and Materials Handling (6907) occupational series. Three other functions average more than $9,000 in annual overtime pay: Material Examiner & Identifier Forklift Operator (6912), Distribution Facilities Manager (2030), and Distribution Process Worker Leader. The latter category includes personnel from Miscellaneous Warehousing & Stock Handling, Materials Handling, Material Examiner & Identifier Forklift Operator, and Supply Clerical and Technician occupational series.

3.3. Science, Technology, Engineering, and Mathematics

In this section, we review five organizations in the Science, Technology, Engineering and Math (STEM) categories: Army Research Laboratory; U.S. Army Aviation and Missile Research, Development, and Engineering Center; Missile Defense Agency; Space and Naval Warfare Systems Command; and Naval Facilities and Engineering Command. The objective of including these organizations is to capture data for STEM related occupational groups, but we also retain any qualifying non-STEM civilian-contractor comparisons. As in previous sections, this section includes a large cross-section of functions unrelated to STEM disciplines. Functions are described using civilian occupational groups, families, and series, for consistency in terminology.

3.3.1. Army Research Laboratory

Approximately 1,820 DoD civilians were employed within the Army Research Laboratory (ARL) at the end of fiscal year 2015. ARL initially identified 76 comparable functions with 285 civilian FTEs and 281 contractor FTEs for analysis. The majority of civilians and contractors were employed at Aberdeen Proving Ground (APG), Maryland and Adelphi Laboratory Center (ALC), Adelphi, Maryland. We also collected a small set of data for employees located at other locations: Redstone Arsenal, Alabama; White Sands Missile Range (WSMR), New Mexico; Raleigh-Durham, North Carolina; and Cleveland, Ohio. Civilians in this analysis from the ARL are employed under the Active Demonstration Projects pay system as Engineer/Scientist (DB), Technical/Business Support (DE), General Support (DK), or Administrative (DJ) employees.

Description of Cost Comparisons

The comparable functions identified by ARL are predominately from the Engineering and Architecture (0800) civilian occupational group. General Administrative, Clerical, and Office Services (0300), Account and Budgeting (0500), Physical Sciences (1300), Mathematical Sciences (1500), and Information Technology (2200) civilian occupational groups are also represented in the Army Research Laboratory comparisons.

A total of 62 functions are in the final dataset that we use for comparisons as a result of data validation and exclusions. The largest occupational series in the ARL comparisons are Engineering Technician (0802), Mechanical Engineer (0830), and Materials Engineer (0806).

Cost Comparisons

Table 26 and Table 27 display 62 comparable functions identified by ARL. The tables have a total of 63 comparisons, which include one function that is duplicated in two different locations. Duplicate position titles occur when more than one set of functions share common position titles or occupational series, but have different responsibilities, job duties, or expertise. Functions are excluded from this table if there are not comparable civilian and contractor functions in the same location or if either side of the comparison does not have full annual payment. Excluded data are retained and

could be used for comparisons across locations if one side of the comparison were normalized to the locality of the other.

Table 26. Average cost of comparable positions at ARL (Civilian $ > Contractor $)

Location	Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CIV/CTR)
APG	Chemist	(b)(4)				1.01
APG	Chemical Engineer					1.01
APG	Research Physicist					1.01
APG	Mechanical Engineer					1.05
APG	Materials Engineer					1.05
APG	Administrative Specialist					1.05
ALC	Program Administrative Specialist					1.05
APG	Mechanical Engineer					1.06
ALC	Electronics Engineer					1.06
APG	Engineering Technician					1.09
APG	Chemist					1.10
ALC/APG	Computer Scientist					1.10
APG	Engineering Technician					1.10
APG	Mechanical Engineer					1.11
ALC	Mechanical Engineer					1.18
APG	Chemical Engineer					1.19
APG	Access Control Specialist					1.19
APG	Mathematician					1.20
ALC	Financial Specialist					1.20
APG	Materials Engineer					1.21
ALC	Mathematician					1.24
ALC	Electronics Technician					1.25
APG	Chemist					1.32
ALC	Electronics Engineer					1.36
APG	Computer Scientist					1.42
APG	Operations Research Analyst					1.43
APG	Electronics Engineer					1.46
ALC	Engineering Technician					1.52
APG	Mechanical Engineer					1.64
ALC	Physicist					1.72
APG	Educational Outreach (Program Specialist)					2.02

Table 27. Average cost of comparable positions at ARL (Contractor $ > Civilian $)

Location	Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CTR/CIV)
ALC/APG	Computer Scientist	(b)(4)				1.05
APG	Administrative Specialist					1.06
WSMR	Electronics Engineer					1.08
ALC	Computer Scientist					1.11
APG	Mechanical Engineer					1.11

Location	Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CTR/CIV)
APG	Research Psychologist	(b)(4)				1.11
ALC	Research Chemist					1.13
APG	Biochemical Engineer					1.17
ALC	Electronics Engineer					1.17
APG	Physicist					1.19
WSMR	Information Technology (IT) Specialist					1.24
APG	Computer Engineer					1.25
APG	Administrative Support Specialist					1.25
APG	Chemist					1.27
ALC	Computer Scientist					1.28
ALC	Electronics Engineer					1.28
ALC	Secretary/Administrative Support Specialist					1.28
APG	General Engineer					1.31
ALC	Computer Scientist					1.32
APG	Electronics Engineer					1.34
APG	Electrical Engineer					1.36
APG	Computer Engineer					1.38
APG	Information Technology (IT) Specialist					1.57
APG	Computer Scientist					1.75
APG	Computer Scientist					1.88
ALC	Computer Engineer					1.98
APG	Information Technology (IT) Specialist					2.27
APG	Mathematician					2.37
APG	Mechanical Engineer					2.41
APG	Operations Research Analyst					2.44
ALC	Computer Operator					2.47
APG	Computer Engineer					2.88

An evaluation of the cost ratios at ARL shows that there is not a predominant trend of higher costs for civilians or contractor positions. The average civilian costs for 31 of the 63 comparisons are greater than the average contractor costs. Eighteen of the comparisons in Table 26 have greater than 10 percent of a difference between average civilian and contractor costs. The average contractor costs for 32 out of 63 comparisons are greater than comparable civilian costs. Twenty-nine of the comparisons in Table 27 have greater than 10 percent of a difference between average civilian and contractor costs.

Engineering Technicians (0802), Physicists (1310), and Educational Outreach Program Specialists (0301) and have the highest cost ratios in Table 26 with average civilian costs ranging from 152 percent to 202 percent of the average comparable contractor costs. The highest cost ratios in Table 27 exist for Computer Engineer (1550), Computer Operator (0332), Operations Research Analyst (1515), IT Specialist (2210), and Mathematician (1520). Each of these functions has average contractor costs that are at least 100 percent greater than comparable civilians.

Mechanical Engineers and Operations Research Analysts show up in the groups with the highest cost ratios in both tables; however, more Mechanical Engineers are in the high civilian-to-contractor cost ratio category (Table 26) with civilian costs being 64 percent higher than contractor costs. Neither end of the cost spectrum is especially informative for Mechanical Engineers since the majority of Mechanical Engineers, characterized by mid-level positions, are in the intermediate spectrum with a civilian-to-contractor cost ratio of 1.11. The lowest Operations Research Analyst ratio correlates to entry-level positions. Specifically, the civilian side of the entry-level and high-level Operations Research Analyst comparisons is filled by DB2 and DB4 pay grades in the Demonstration Army Engineers and Scientists (DB) pay-scale respectively.

Overtime pay is not a significant component of the total fully burdened cost to the government for civilians at ARL. The only civilian positions that recorded significant overtime pay at ARL in 2015 are Engineering Technician, Computer Scientist, and Financial Specialist. Average annual overtime pay for these positions ranges from $3,000-$5,000 in the data sample from 2015.

3.3.2. Defense Threat Reduction Agency

Approximately 1,170 DoD civilians were employed within the Defense Threat Reduction Agency (DTRA) at the end of fiscal year 2015. DTRA initially identified 21 comparable functions with 48 civilian FTEs and 80 contractor FTEs for analysis. All civilians and the majority of contractors were employed at Fort Belvoir, Virginia. We also collected data for contractors located in Albuquerque, New Mexico and Eglin Air Force Base, Florida. The comparisons with contractors outside of the National Capital Region are not included in the tables below, but could be normalized by locality pay for comparison. All DTRA civilians in this analysis are employed under the General Schedule pay system.

Description of Cost Comparisons

The comparable functions identified by DTRA predominately align with the General Administrative, Clerical, and Office Services (0300) and Miscellaneous Occupations (0000) civilian occupational groups. Social Sciences, Psychology, and Welfare (0100), Accounting and Budget (0500), and Engineering and Architecture (0800) civilian occupational groups are also represented in the DTRA comparisons.

A total of 15 functions are in the final dataset that we use for comparisons as a result of data validation and exclusions. The largest occupational series in the DTRA comparisons are Miscellaneous Administration and Program (0301), Security Administration (0080), and Intelligence (0132).

Cost Comparisons

Table 28 and Table 29 display 15 comparable functions identified by DTRA. Functional comparisons that share the same position title differ by job requirements or levels of responsibility. For example, the two Staff Accountant positions in Table 28 consist of senior and mid-level pay grades. Functions are excluded from this table if there are not comparable civilian and contractor functions in the same

location or if either side of the comparison does not have full annual payment. Excluded data are retained and could be used for comparisons across locations if one side of the comparison were normalized to the locality of the other.

Table 28. Average cost of comparable positions at DTRA (Civilian $ > Contractor $)

Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CIV/CTR)
Staff Accountant	(b)(4)				1.08
Staff Accountant					1.82

Table 29. Average cost of comparable positions at DTRA (Contractor $ > Civilian $)

Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CTR/CIV)
Administrative Support	(b)(4)				1.09
Accounting Technician					1.31
CWMD Exercise Planner					1.35
CWMD Exercise Planner					1.36
General Engineer					1.37
Intelligence Specialist					1.38
Security Operations					1.41
Intelligence Operations Specialist					1.73
Strategic Planner					1.80
Program Manager					1.81
Financial Analyst					2.23
International Relations Specialist					2.60
Security Specialist					3.41

An evaluation of the cost ratios at DTRA shows a trend of higher costs for contractor positions. The average civilian costs for 2 of the 15 comparisons are greater than the average contractor costs; whereas, 13 comparisons have greater contractor costs. With the exception one comparison in each table, most comparisons have greater than 10 percent of a difference between average civilian and contractor costs.

Staff Accountants (0510) are the only functions with greater average civilian costs. The positions described as mid-level experience show a greater difference, with the average civilian cost being 82 percent greater than the average contractor cost. The highest cost ratios in Table 29 exist for Financial Analyst (0501), International Relations Specialist (0131), and Security Specialist (0080). Each of these functions has average contractor costs that are at least 100 percent greater than comparable civilians.

Overtime pay is not a relevant component of the total fully burdened cost to the government for civilians at DTRA. Of the civilians included in our study, no overtime pay was recorded during calendar year 2015.

3.3.3. U.S. Army Aviation and Missile Research, Development, and Engineering Center

Approximately 2,880 DoD civilians were employed within the U.S. Army Aviation and Missile Research, Development, and Engineering Center (AMRDEC) at the end of fiscal year 2015. AMRDEC initially identified 50 comparable functions with 2,190 civilian FTEs and 243 contractor FTEs for analysis. The majority of civilians and contractors were employed at Redstone Arsenal (RSA), Alabama. We also collected a small set of data for employees located at Corpus Christi Army Depot (CCAD), Texas and Joint Base Langley-Eustis (JBLE), Virginia. Civilians in this analysis from AMRDEC are all employed either under the Federal Wage System or the Active Demonstration Projects pay system as Engineer/Scientist (DB), Technical/Business Support (DE), or General Support (DK) employees.

Description of Cost Comparisons

The comparable functions identified by AMRDEC are predominately from the Engineering and Architecture (0800) civilian occupational group. Thirteen other civilian occupational groups and families are in the AMRDEC comparison data, including General Administrative, Clerical, and Office Services (0300), Quality Assurance, Inspection, and Grading (1900), and Physical Sciences (1300).

A total of 45 functions are in the final dataset that we use for comparisons as a result of data validation and exclusions. All organizations distinguished comparable positions by level of expertise. In identifying comparisons, AMRDEC specifically defines positions by their level of expertise; hence, all positions are preceded with a label of Junior, Journeyman, or Senior. The largest occupational series representations in the comparisons are Journeyman Engineer (0801). Approximately 85 percent of the civilian and contractor positions in this analysis are within one of the levels of expertise for Engineers.[25]

Cost Comparisons

Table 30 and Table 31 display 45 comparable functions identified by AMRDEC. Duplicate position titles occur when more than one set of functions share common position titles or occupational series, but have different responsibilities, job duties, or expertise. Functions are excluded from this table if there are not comparable civilian and contractor functions in the same location or if either side of the comparison does not have full annual payment.

Table 30. Average cost of comparable positions at AMRDEC (Civilian $ > Contractor $)

Location	Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CIV/CTR)
RSA	Journeyman Engineer	(b)(4)				1.02
CCAD	Senior Engineer					1.11
JBLE	Journeyman Engineering Technician					1.17
RSA	Journeyman Administrative					1.17
RSA	Senior Administrative					1.20

[25] Engineers in this organization comprise the following civilian occupational series codes: 0801, 0830, 0854, 0855, 0861, 1310, 1320, and 1550.

Location	Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CIV/CTR)
JBLE	Journeyman Engineer	(b)(4)				1.21
RSA	Journeyman Administrative					1.21
CCAD	Journeyman Engineer					1.30
JBLE	Senior Machinist					1.38
JBLE	Senior Sheet Metal Mechanic					1.51
JBLE	Journeyman Electronic Technician					1.94
JBLE	Senior Aircraft Mechanic					2.40

Table 31 Average cost of comparable positions at AMRDEC (Contractor $ > Civilian $)

Location	Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CTR/CIV)
RSA	Computer/Network Engineers	(b)(4)				1.00
RSA	Journeyman Program Analyst					1.02
RSA	Junior Administrative					1.02
RSA	Journeyman Specialist (CM, DM, other)					1.04
RSA	Journeyman Quality Assurance Specialist					1.05
RSA	Senior Support Assistant (OA)					1.08
RSA	Senior Engineer					1.11
RSA	Journeyman Information Management					1.16
RSA	Journeyman Administrative					1.18
RSA	Journeyman Engineer					1.19
RSA	Senior Quality Assurance Specialist					1.20
RSA	Senior Program Analyst					1.21
RSA	Junior Engineer					1.22
RSA	Journeyman Configuration Management					1.24
RSA	Junior Engineer					1.25
RSA	Junior Specialist (CM, DM, other)					1.27
RSA	Senior Engineer					1.29
RSA	Senior Program Analyst					1.31
RSA	Journeyman Program Management					1.34
RSA	Journeyman Program Analyst					1.35
RSA	Journeyman Technical Specialist					1.36
RSA	Senior Technician					1.37
RSA	Senior Engineer					1.38
RSA	Journeyman Engineer					1.41
RSA	Junior Technician					1.43
RSA	Journeyman Facilities Specialist					1.44
RSA	Junior Engineer					1.46
RSA	Senior Facilities Specialist					1.56
RSA	Security Specialist					1.68
RSA	Program Operations Lead					1.80
RSA	Senior Program Management					1.93
RSA	Junior Program Analyst					2.02
RSA	Senior Specialist (CM, DM, other)					2.21

In general, the cost ratios at AMRDEC indicate that civilians tend to cost less than contractors for more of the functional comparisons. The average civilian costs for 12 of the 45 comparable functions (or positions) are greater than the average contractor costs, while the average contractor costs for 33 out of 45 functions are greater than comparable civilian costs. Seven comparisons have less than 10 percent of a difference between average civilian and contractor costs.

The functions with the highest cost ratios in Table 30 are Senior Sheet Metal Mechanic, Journeyman Electronic Technician, and Senior Aircraft Mechanic. Each of these comparisons is made at Joint Base Langley-Eustis. Journeyman Electronic Technician (0856) and Senior Aircraft Mechanic (8852) functions have average civilian costs that are 94 percent and 140 percent greater than contractors, respectively.

The highest cost ratios in Table 31 exist for Senior Specialist (0301/2210), Junior Program Analyst (0301/0343/0399/0802/0899), and Senior Program Management (0301/0343). Each of these functions has average contractor costs that are at least 93 percent more than the comparable civilians. In the case of Senior Specialist, average contractor costs are 121 percent greater than average civilian costs. The Junior Engineer function, with a cost ratio of 1.41, is notable because of the large number of CFTEs that are in this comparison. Likewise, Senior Engineer and Journeyman Engineer ratios, 1.11 and 1.22 respectively, contain data from large numbers of civilians and contractors.

Figure 9 displays the average overtime pay for functions at AMRDEC. The overtime chart represents the average amount of overtime pay by function and excludes functions with average overtime values less than $500. The civilian overtime pay values include data for individuals who did not receive overtime. Overtime pay is a more significant part of total compensation for civilians analyzed at AMRDEC than the previous case of ARL, but less than most logistics and depot organizations. Out of 2,190 civilian FTEs included in this analysis, 430 received some overtime pay in 2015. Two civilian functions recorded more than $10,000 in average overtime pay. Eighteen functions in the civilian side of a comparison recorded between $1,000 and $7,000 of average overtime pay in the 2015 data sample.

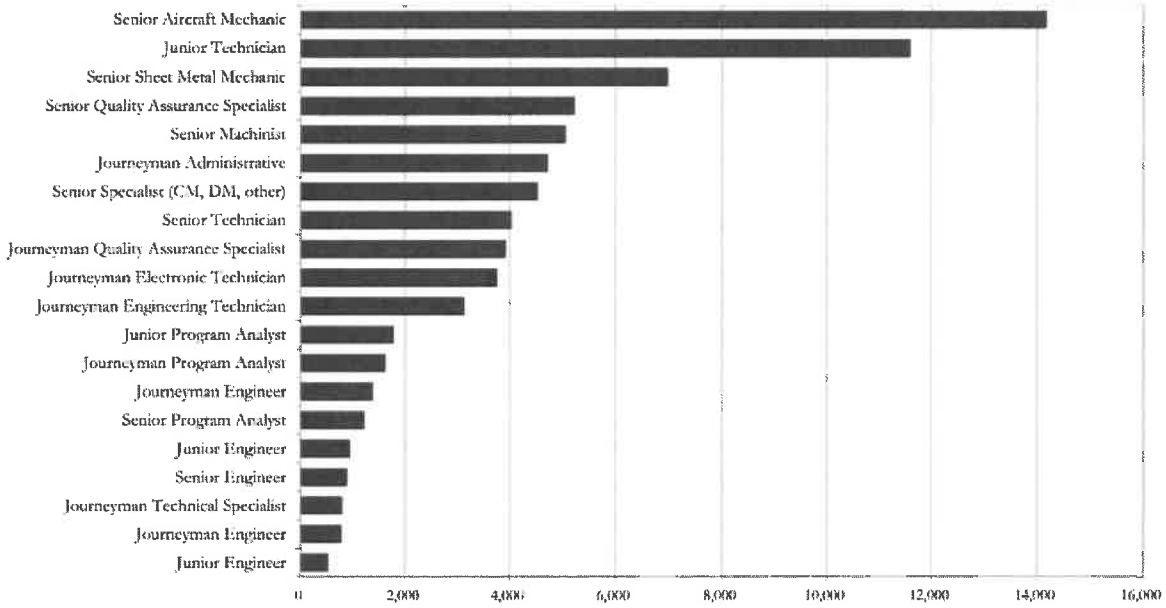


Figure 9. AMRDEC: Average 2015 annual overtime compensation ($)

3.3.4. Missile Defense Agency

There were 2,323 DoD civilians employed at the Missile Defense Agency (MDA) at the end of fiscal year 2015. MDA initially identified 55 comparable functions with 1,760 civilian FTEs and 2,080 contractor FTEs for analysis. The majority of civilians and contractors were employed at Redstone Arsenal (RSA), Alabama. We also collected smaller data sets for employees located at Missile Defense Integration and Operations Center (MDIOC), Schriever Air Force Base, Colorado Springs, Colorado; Naval Support Facility (NSF) Dahlgren, Virginia; and NCR. In our analysis of MDA civilians, the core pay-plan is DoD's Acquisition Demo, Business and Technology Management Professional (NH)(Pay Bands 1-4), with minor numbers in Administrative Support (NK)(Pay Bands 1-3) and Defense Civilian Intelligence Personnel System (DCIPS)(GG). Additionally, MDA's Missile Defense Career Development Program, a three year internship used to grow its future workforce, uses the General Service (GS) pay-plan.

Description of Cost Comparisons

The comparable functions identified by MDA are predominately in the Engineering and Architecture (0800), General Administrative, Clerical, and Office Services (0300), and Account and Budgeting (0500) civilian occupational groups. Ten additional civilian occupational groups are in the MDA comparison data, including Social Sciences, Psychology, and Welfare (0100), Mathematical Sciences (1500), and Information Technology (2200).

A total of 47 functions are in the final dataset that we use for comparisons as a result of data validation and exclusions. In identifying comparable functions, MDA grouped functions with similar jobs and tasks, regardless of potential location differences. MDA removed civilian supervisory positions from

the comparison dataset due to the belief that there was not sufficient commonality (80%) with contractors performing similar functions. We separate the comparisons by location in our analysis to account for disparities in locality pay; however, these functions are equivalent in terms of jobs being performed and could be merged if normalized by a single locality pay scale. The largest function, by position title, in our comparisons is General Engineers; however, this position title is used for numerous occupational series and groups within MDA. If sorted by occupational series among the civilians, the largest series is General Engineer (0801), which includes position titles such as Facilities and Environmental Analyst, Quality, Safety & Mission Assurance Specialist, and Testing Analyst. The Management and Program Analysis (0343) series is also largely represented by various position titles.

Cost Comparisons

Table 32 and Table 33 display 47 comparable functions identified by MDA.[26] These functions are separated by location to create 117 comparisons by function and location. Duplicate position titles occur at the same location when more than one set of functions share common position titles or occupational series, but have different responsibilities, job duties, or expertise. Functions are excluded from this table if there are not comparable civilian and contractor functions in the same location or if either side of the comparison does not have full annual payment. Excluded data is retained and could be used for comparisons across locations if one side of the comparison is normalized to the locality of the other.

Table 32. Average cost of comparable positions at MDA (Civilian $ > Contractor $)

Location	Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CIV/CTR)
MDIOC	General Engineer	(b)(4)				1.00
RSA	Human Resources Specialist					1.01
RSA	Cost Estimating Analyst					1.03
NCR	International Affairs Specialist					1.03
NCR	Public Affairs Specialist					1.03
RSA	Acquisition Analyst					1.04
MDIOC	Acquisition Analyst					1.05
Other	Operations Support Analyst					1.05
NSF	Acquisition Analyst					1.09
NCR	Administrative Services Specialist					1.09
NCR	International Affairs Specialist					1.09
MDIOC	Public Affairs Specialist					1.09
RSA	Business and Financial Management Analyst					1.10
MDIOC	Quality, Safety & Mission Assurance Specialist					1.10
RSA	Acquisition Analyst					1.11
Other	Acquisition Analyst					1.11
Other	Technical Intelligence Operations Specialist					1.12
NSF	Business and Financial Management Analyst					1.13

[26] Civilian data is adjusted by locality for two comparisons to align with contractor locations: Cost Estimating Analysts are adjusted to National Capital Region locality; a senior level Public Affairs Specialist position is adjusted to Huntsville/Redstone Arsenal locality.

Location	Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CIV/CTR)
Other	General Engineer	(b)(4)				1.13
NSF	Acquisition Analyst					1.14
MDIOC	International Affairs Specialist					1.17
Other	Information Assurance Specialist					1.19
RSA	Operations Support Analyst					1.21
NSF	Administrative Services Specialist					1.30
RSA	Technical Intelligence Operations Specialist					1.44

Table 33. Average cost of comparable positions at MDA (Contractor $ > Civilian $)

Location	Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CTR/CIV)
RSA	Business and Financial Management Analyst	(b)(4)				1.00
MDIOC	Business and Financial Management Analyst					1.01
RSA	Operations Support Analyst					1.01
MDIOC	Information Assurance Specialist					1.02
Other	Business and Financial Management Analyst					1.03
RSA	Acquisition Analyst					1.03
RSA	Information Assurance Specialist					1.03
MDIOC	Administrative Services Specialist					1.03
RSA	Technical Intelligence Operations Specialist					1.05
RSA	Information Technology Specialist					1.06
NSF	Earned Value Management Analyst					1.07
RSA	Operations Support Analyst					1.07
MDIOC	Operations Support Analyst					1.07
RSA	Facilities and Environment Analyst					1.08
RSA	Earned Value Management Analyst					1.08
MDIOC	Acquisition Analyst					1.09
MDIOC	Information Technology Specialist					1.09
RSA	Quality, Safety & Mission Assurance Specialist					1.09
RSA	Logistics Management Specialist					1.09
Other	Cost Estimating Analyst					1.09
NSF	International Affairs Specialist					1.09
Other	Operations Support Analyst					1.11
RSA	Quality, Safety & Mission Assurance Specialist					1.11
RSA	Logistics Management Specialist					1.11
Other	Earned Value Management Analyst					1.11
RSA	Quality, Safety & Mission Assurance Specialist					1.11
NSF	Business and Financial Management Analyst					1.11
NCR	Information Assurance Specialist					1.12
NCR	Testing Analyst					1.12
MDIOC	Testing Analyst					1.12
RSA	Acquisition Analyst					1.13
RSA	Technical Intelligence Operations Specialist					1.13
NCR	Administrative Services Specialist					1.14

Location	Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CTR/CIV)
RSA	Business and Financial Management Analyst	(b)(4)				1.14
Other	Quality, Safety & Mission Assurance Specialist					1.14
MDIOC	Technical Intelligence Operations Specialist					1.15
Other	General Engineer					1.16
RSA	Information Technology Specialist					1.16
NCR	Operations Support Analyst					1.16
MDIOC	Administrative Services Specialist					1.16
NSF	Testing Analyst					1.17
NSF	Acquisition Analyst					1.17
RSA	Business and Financial Management Analyst					1.17
NCR	Administrative Services Specialist					1.18
NCR	Business and Financial Management Analyst					1.18
RSA	Facilities and Environment Analyst					1.18
RSA	Human Resources Specialist					1.18
NSF	Technical Intelligence Operations Specialist					1.18
Other	Facilities and Environment Analyst					1.19
RSA	Information Assurance Specialist					1.19
NCR	International Affairs Specialist					1.19
RSA	Facilities and Environment Analyst					1.20
NSF	Operations Support Analyst					1.21
NSF	Quality, Safety & Mission Assurance Specialist					1.21
MDIOC	Technical Intelligence Operations Specialist					1.22
NSF	Logistics Management Specialist					1.23
NSF	International Affairs Specialist					1.26
NSF	Earned Value Management Analyst					1.26
NSF	General Engineer					1.26
NCR	Business and Financial Management Analyst					1.26
RSA	Information Technology Specialist					1.28
RSA	Public Affairs Specialist					1.29
MDIOC	Quality, Safety & Mission Assurance Specialist					1.30
NSF	Logistics Management Specialist					1.30
RSA	General Engineer					1.31
RSA	Testing Analyst					1.31
RSA	Quality, Safety & Mission Assurance Specialist					1.31
NCR	Human Resources Specialist					1.32
RSA	Administrative Services Specialist					1.32
NSF	Human Resources Specialist					1.38
RSA	Testing Analyst					1.40
NSF	Logistics Management Specialist					1.41
MDIOC	General Engineer					1.42
MDIOC	Operations Support Analyst					1.45
NCR	General Engineer					1.45
RSA	International Affairs Specialist					1.47
RSA	Technical Intelligence Operations Specialist					1.47

Location	Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CTR/CIV)
RSA	Earned Value Management Analyst	(b)(4)				1.50
NCR	General Engineer					1.51
MDIOC	General Engineer					1.59
RSA	Testing Analyst					1.59
NSF	General Engineer					1.62
RSA	Cost Estimating Analyst					1.63
RSA	Testing Analyst					1.64
MDIOC	Testing Analyst					1.65
Other	Testing Analyst					1.70
RSA	General Engineer					1.73
RSA	General Engineer					1.79
NCR	Facilities and Environment Analyst					1.80
NCR	Information Technology Specialist					1.83
NSF	General Engineer					2.01
NSF	Facilities and Environment Analyst					2.02

The cost ratios in Table 32 and Table 33 show that civilians at MDA cost equal or less than contractors in a majority of function comparisons. Of 117 comparisons, 25 functions (or positions) have average civilian costs that are greater than the comparable contractor costs and 92 functions have average contractor costs that are greater than the comparable civilian costs. Of the 25 comparisons with greater civilian costs in Table 32, 11 comparisons have average civilian costs that are more than 10 percent greater than average contactor costs. Of the 92 comparisons with greater contractor costs in Table 33, the average contractor costs for 71 comparisons are more than 10 percent greater than average comparable civilian costs. There are 35 comparisons that have less than or equal to 10 percent of a difference between average civilian and contractor costs.

Operations Support Analysts (0301/0343), Administrative Services Specialists (0301/0343), and Technical Intelligence Operations Specialists (0080/0132) have the highest cost ratios in Table 32. On average, Technical Intelligence Operations Specialists positions have contractor costs that are approximately 15 percent greater than civilian costs across all locations and skill levels.[27] The highest cost ratios in Table 33 are for General Engineers and Facilities and Environment Analysts. On average, Facilities and Environment Analyst and General Engineer positions have contractor costs that are approximately 21 percent and 60 percent greater than civilian costs, respectively, across locations and skill levels. Comparisons with the same position title frequently appear in both tables for this study, which suggest that there is variance in cost comparison ranges that spans across the equilibrium of equal costs.

Figure 10 displays the average overtime pay for functions at MDA. The overtime chart represents the average amount of overtime pay by function and excludes functions with average overtime pay

[27] Some position titles are represented in multiple comparisons based on different locations, responsibilities and skill levels. The average of 25 percent (Technical Intelligence Operations Specialists) is calculated from a weighted average of all comparisons with the same position title.

values less than $500. Overtime averages include data for individuals who did not receive overtime pay. Overtime pay is not a significant component of total compensation for most civilians analyzed at MDA, averaging $1,000 per position in the comparison. Only the International Affairs Specialist (0080/0130/0343) position recorded more than $10,000 in average overtime pay and this was the result of an outlier data point. This comparison group (b)(4) included (b civilian personnel, (b)(4) of whom applied (b)(4) accepted for an external Civilian Expeditionary Workforce (CEW) detail assignment, while the remaining (b)(4) received zero overtime pay. MDA had (b)(4) other personnel selected for external CEW assignments in CY 2015, (b)(4) in the Technical Intelligence Operations Specialist and (b)(4) in the Business and Financial Management Analyst positions.

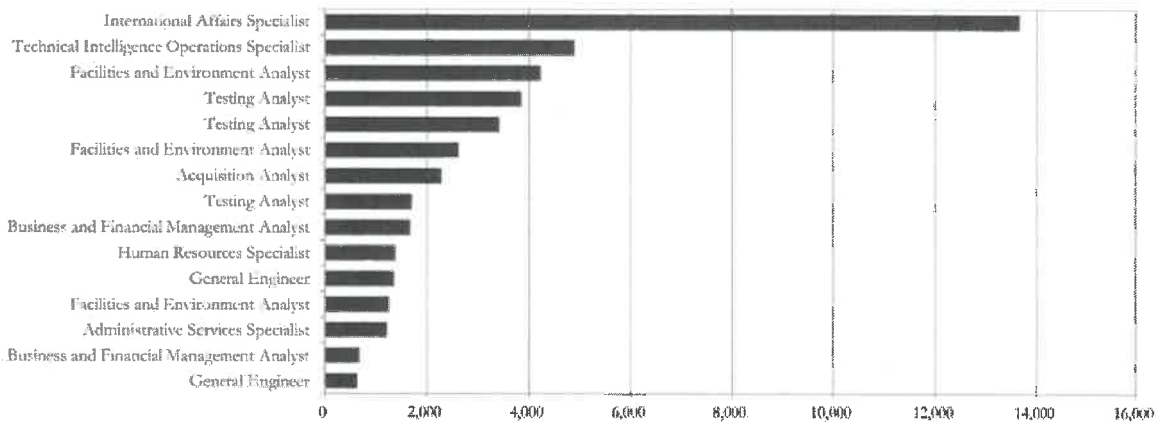


Figure 10. MDA: Average 2015 annual overtime compensation ($)

3.3.5. Space and Naval Warfare Systems Command

Approximately 4,670 DoD civilians were employed at San Diego and Hawaii locations of Space and Naval Warfare Systems Command (SPAWAR) at the end of fiscal year 2015. SPAWAR identified 38 different job series from the civilian and contractor positions. We collected an initial dataset of 44 comparable functions with 4,092 civilian FTEs and 1,484 contractor FTEs for analysis. The majority of civilians and contractors were employed in San Diego, California; a small subset was employed in Hawaii. The population includes Appropriated/General Fund (GF), GF Reimbursable, and Navy Working Capital Fund (NWCF) reimbursable civilians. SPAWAR civilians are paid under one of three systems: General Schedule pay plan; Demonstration (Navy only) pay plan as Demonstration Administrative (DA), Demonstration General (DG), Demonstration Professional (DP), Demonstration Specialist (DS); or Demonstration Scientific Engineering (ND), Demonstration General Support (NG), Reserved (NM). Contractors are funded by both Appropriated/GF and NWCF contracts.

Description of Cost Comparisons

The comparable functions identified by SPAWAR are predominately from the Engineering and Architecture (0800), General Administrative, Clerical, and Office Services (0300), Information

Technology (2200), and Mathematical Sciences (1500) civilian occupational groups. Eight additional civilian occupational groups are represented in smaller quantities within the SPAWAR comparison data.

A total of 37 functions are in the final dataset that we use for comparisons as a result of data validation and exclusions. The position titles in the SPAWAR comparisons are more generic than those in other organizations in our study due to the use of the Alternative Pay System (APS) or Science and Technology Reinvention Laboratory (STRL) Personnel Management Demonstration Project pay systems, which limit most position titles to Scientist, Engineer, Technician, Administrative Specialist, Assistant, Supervisor, and Manager.[28] Moreover, many of the SPAWAR comparisons consist of individuals with multiple occupational series from the civilian perspective. Our comparisons are based on assessments made by the organization rather than position descriptions or position titles. The largest functional areas, by position title, are Engineers and Information Technology (IT) Specialists; however, these position titles are used for multiple occupational series and comparisons within the SPAWAR data. The largest number of employees is in Electronics Engineering (0855), Information Technology Management (2210), and Computer Science (1550).

Cost Comparisons

Table 34 and Table 35 display 37 comparable functions identified by SPAWAR. Duplicate position titles occur when more than one set of functions share common position titles or occupational series, but have different responsibilities, job duties, or expertise. Functions are excluded from the tables if there are not comparable civilian and contractor functions in the same location or if either side of the comparison does not have full annual payment.

Table 34. Average cost of comparable positions at SPAWAR (Civilian $ > Contractor $)

Location	Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CIV/CTR)
San Diego	Manager	(b)(4)				1.00
San Diego	Administrative Specialist					1.03
Hawaii	Electronics Engineer					1.04
San Diego	Manager/Supervisor					1.04
San Diego	Administrative Specialist/Supervisor					1.11
San Diego	Administrative Specialist					1.13
San Diego	Administrative Specialist					1.14
San Diego	Administrative Specialist					1.17
San Diego	Administrative Specialist					1.18
San Diego	Technician/Supervisor					1.2
San Diego	Financial Management/Supervisor					1.24
Hawaii	Information Technology					1.28
San Diego	Administrative Specialist/Manager					1.28
San Diego	Supervisor/Manager					1.32

[28] STRL has an exception for Information Technology Management (2210) occupational series positions, where OPM titles are used.

Location	Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CIV/CTR)
San Diego	Supervisor Psychologist (Engineering)	(b)(4)				1.33
San Diego	Supervisor/Manager					1.33
San Diego	Supervisor/Manager					1.81
San Diego	Administrative Specialist/Supervisor					2.11

Table 35. Average cost of comparable positions at SPAWAR (Contractor $ > Civilian $)

Location	Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CTR/CIV)
San Diego	Technical Specialist/Supervisor	(b)(4)				1.03
San Diego	Administrative Specialist/Manager					1.03
San Diego	Assistant					1.05
San Diego	Assistant					1.05
San Diego	Supervisor					1.08
Hawaii	Electronics Engineer					1.09
San Diego	Assistant					1.14
San Diego	IT Specialist					1.16
San Diego	Engineer					1.18
San Diego	Supervisor Engineer/Scientist					1.2
San Diego	Assistant					1.31
San Diego	Supervisor					1.33
San Diego	Administrative Specialist					1.39
San Diego	Scientist/Manager					1.41
San Diego	Administrative Specialist					1.42
San Diego	Scientist/Manager					1.51
San Diego	Assistant					1.61
San Diego	Administrative Specialist					1.65
San Diego	Technician/Supervisor					1.96

The cost ratios in Table 34 and Table 35 indicate that fully burdened personnel costs at SPAWAR are not consistently higher for civilians or contractors across all functions. Of 37 comparable functions, 18 functions (or positions), shown in Table 34, have average civilian costs that are greater than the comparable contractor costs. Table 35 displays the 19 functions that have average contractor costs that are greater than the comparable civilian costs. Between both tables, 10 out of 37 comparisons that have less than 10 percent of a difference between average civilian and contractor costs.

Determining the highest cost ratios based on the position titles in Table 34 and Table 35 can be somewhat misleading since comparisons may contain different specific job titles or occupational series. Moreover, multiple comparisons have the same position titles but are separated based on known tasks and job requirements. For example, in Table 35, the Scientist/Manager comparison with a cost ratio of 1.51 is composed of civilians from Operations Research (1515) occupational series, and the Scientist/Manager comparison with a ratio of 1.41 has civilians from the Computer Science (1550) occupational series. Likewise, two comparisons with position titles of Assistant, both with cost ratios of 1.05, are composed of Secretary (0318) and Clerk-Typist (0322), respectively.

The highest cost ratios in Table 34, and the only ones above 1.33, include civilians from the Miscellaneous Occupations (0000) occupational group. The civilians in the Supervisor/Manager position with a ratio of 1.81 are employed as Security Administration (0080) occupational series. The civilians in the Administrative Specialist/Supervisor comparison, with a cost ratio or 2.11, are all in the Community Planning (0020) occupational series. The latter cost ratio indicates that these civilians cost 111 percent greater than the cost of their contractor equivalents.

Figure 11 displays the average overtime pay for civilian positions at SPAWAR.[29] The overtime chart represents the average amount of overtime pay by function and excludes functions with average overtime values less than $500. Overtime averages include data for individuals who did not receive overtime pay. Overtime pay is not a significant component of total compensation for most civilians analyzed at SPAWAR. The primary outlier of $17,034 in overtime pay is for Systems Analysis/Customer Support IT Specialists (2210) who are employees directly involved in Fleet Installation Support. The average overtime pay of the remaining employees was $1,098. For Technicians (0802/0856), (b)(4) out of (b)(4 employees received overtime pay. Of those receiving overtime pay, the average was $10,466.

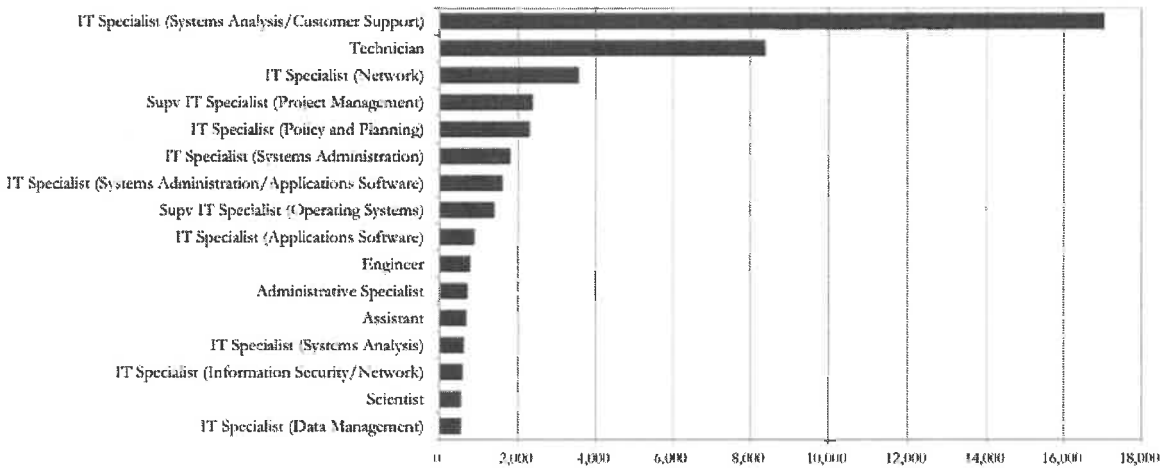


Figure 11. SPAWAR: Average 2015 annual overtime compensation ($)

Figure 11 displays the average overtime pay for civilian positions at SPAWAR.[30] The overtime pay chart represents the average amount of overtime by function and excludes functions with average overtime values less than $500. Overtime averages include data for individuals who did not receive overtime. Overtime pay is not a significant component of total compensation for most civilians at SPAWAR. Of those employees who earned overtime pay, the primary outlier of $17,034 in overtime pay is for Systems Analysis/Customer Support IT Specialists (2210) who are employees directly involved in Fleet Installation Support. The average overtime pay of the remaining employees who

[29] SPAWAR overtime values are grouped by specific civilian position title rather than comparison group due to the number of redundant position titles in the comparison tables.

[30] SPAWAR overtime pay values are grouped by specific civilian position title rather than comparison group due to the number of redundant position titles in the comparison tables.

received it is $1,333. For Technicians (0802/0856), (b)(4) out of (b)(4) employees received overtime pay. Of those receiving overtime pay, the average was $8,383.

3.3.6. Naval Facilities and Engineering Command

At the end of fiscal year 2015, there were 1,683 DoD civilians employed at Hawaii and Guam locations of Naval Facilities and Engineering Command (NAVFAC). Approximately 80 percent of the civilians and contractors were in Guam. NAVFAC initially identified 85 comparable functions with 431 civilian FTEs and 417 contractor FTEs for analysis. Nine of these functions do not have both civilian and contractor representation; therefore, they are excluded from subsequent analysis.

Description of Cost Comparisons

The comparable functions identified by NAVFAC are predominately in the Engineering and Architecture (0800) and Business and Industry (1100) civilian occupational groups. We also make comparisons of personnel from 26 additional occupational groups and families. NAVFAC civilian personnel are in the General Schedule pay system and the Federal Wage System.

A total of 73 functions are in the final dataset that we use for comparisons as a result of data validation and exclusions, of which, 70 are located in Guam. As with other organizations, our comparisons are based on assessments made by the organization rather than position descriptions or position titles; therefore, some comparisons may consist of multiple occupational series or standard position titles. The largest functional areas are from Civil Engineering (0810), Contracting (1102), and Engineering Technical (0802).

Cost Comparisons

Table 36 and Table 37 display 73 comparable functions analyzed within NAVFAC. Position titles appear more than once in the tables when multiple functions share a common position title or occupational series, but have different responsibilities, job duties, or levels of expertise. Functions are excluded from the tables if there are not comparable civilian and contractor functions in the same location or if either side of the comparison does not have a full annual payment.

Table 36. Average cost of comparable positions at NAVFAC (Civilian $ > Contractor $)

Location	Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CIV/CTR)
Guam	Supervisory Environmental Engineer	(b)(4)				1.01
Guam	Welder					1.05
Guam	Supervisory Information Tech Specialist					1.06
Guam	Sheet Metal Worker					1.06
Guam	Supervisory Utilities Specialist					1.07
Guam	Geographic Information System Specialist					1.08
Guam	Laborer					1.08
Guam	Engineering Technician					1.10
Guam	Equipment Specialist					1.10
Guam	Electrical Engineer					1.11

Location	Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CIV/CTR)
Guam	Facility Operations Specialist	(b)(4)				1.11
Guam	Maintenance Mechanic Supervisor					1.11
Guam	High Voltage Electrician					1.14
Guam	Architect					1.19
Guam	Painter					1.20
Guam	Safety and Occupational Health Manager					1.22
Guam	Supply Technician					1.23
Guam	Base Operating Support Contract (BOSC) Analyst					1.24
Guam	Machinist					1.25
Guam	Plumber					1.27
Guam	Environmental Protection Specialist					1.31
Guam	High Voltage Electrician Leader					1.31
Guam	Electrician					1.32
Guam	Supervisory Mechanical Engineer					1.33
Guam	Air Conditioning Equipment Mechanic					1.33
Guam	Program Analyst					1.34
Guam	Security Specialist					1.35
Guam	Supervisory Electrical Engineer					1.37
Guam	Carpenter					1.37
Guam	Supervisory Financial Management Specialist					1.38
Guam	Installation Energy Manager					1.40
Guam	Engineering Equipment Operator					1.40
Guam	Electronic Industrial Controls Mechanic					1.42
Guam	Supervisory Facilities Requirements Specialist					1.43
Guam	Purchasing Agent (Office Automation)					1.46
Guam	Program Analyst					1.48
Guam	Performance Assessment Representative					1.51
Guam	Safety and Occupational Health Specialist					1.53
Guam	Human Resources Officer					1.53
Guam	Natural Resources Specialist					1.56
Guam	Water Treatment Plant Operator					1.57
Guam	Environmental Engineer					1.58
Guam	Engineering Technician					1.58
Guam	Computer Assistant					1.60
Guam	Human Resources Specialist					1.61
Guam	Mechanical Engineer					1.61
Guam	Administrative Officer					1.62
Guam	Community Planner					1.65
Guam	Supervisory Contract Specialist					1.67
Guam	Environmental Engineer					1.69
Guam	Information Technology Specialist					1.69
Guam	Financial Management Analyst					1.70
Guam	Procurement Analyst					1.80
Guam	Quality Assurance Specialist					1.86

Location	Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CIV/CTR)
Guam	Environmental Protect Specialist	(b)(4)				2.04
Guam	Contract Specialist					2.15
Guam	Environmental Protect Specialist					2.54

Table 37. Average cost of comparable positions at NAVFAC (Contractor $ > Civilian $)

Location	Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CTR/CIV)
Guam	Supervisory Utilities Specialist	(b)(4)				1.01
Guam	Powered Support Systems Supervisor					1.02
Guam	Management Assistant					1.03
Guam	Civil Engineer					1.04
Guam	Secretary (Office Automation)					1.06
Guam	Clerk					1.07
Guam	Program Manager					1.09
Hawaii	Engineer Technician					1.16
Guam	General Engineer					1.18
Guam	Transportation Operations					1.23
Guam	Supervisory Financial Management Analyst					1.25
Guam	Supervisor Water Systems					1.29
Guam	Business Director					1.30
Hawaii	Human Resources Specialist (Classification)					1.35
Hawaii	Civil Engineer					1.47
Guam	Maintenance and Operations Supervisor					1.52

The distribution of cost ratios for fully burdened personnel costs at NAVFAC is asymmetrical with more functions having higher civilian costs. Of 73 comparable functions, 57 functions (or positions), shown in Table 36, have average civilian costs that are greater than the comparable contractor costs. In this table, 21 of the comparisons have average civilian costs that are at least 50 percent greater than the average contractor costs.

Table 37 displays the 16 functions that have average contractor costs greater than comparable civilian costs. Between the two tables, fourteen comparisons have less than 10 percent of a difference between average civilian and contractor costs.

Between Guam and Hawaii, location appears to be a significant variable based on the cost ratio observations. All of the comparisons with greater civilian costs are located in Guam, an effect likely influenced by the local labor environment. OCONUS civilian labor rates are also affected by hiring and retention incentives, Cost of Living Allowance (COLA), and Non-Foreign Post Differential (NFPD) pay, which should be considered when comparing CONUS and OCONUS cost ratios.

Figure 12 displays the average overtime pay for functions at NAVFAC. The overtime pay chart represents the average amount of overtime pay by function and excludes functions with average overtime pay values less than $500. Overtime pay averages include data for individuals who did not

receive overtime. Overtime pay is a component of total compensation for the majority of civilians analyzed at NAVFAC. In this data sample, (b)(4) out of (b)(4) civilians received overtime pay. The functions recording the highest overtime pay, at $18,634 and $11,782 respectively, are Powered Support Systems Supervisor (5378) and Supervisory Contract Specialist (1102). An additional twelve functions have average civilian overtime pay greater than $4,000.

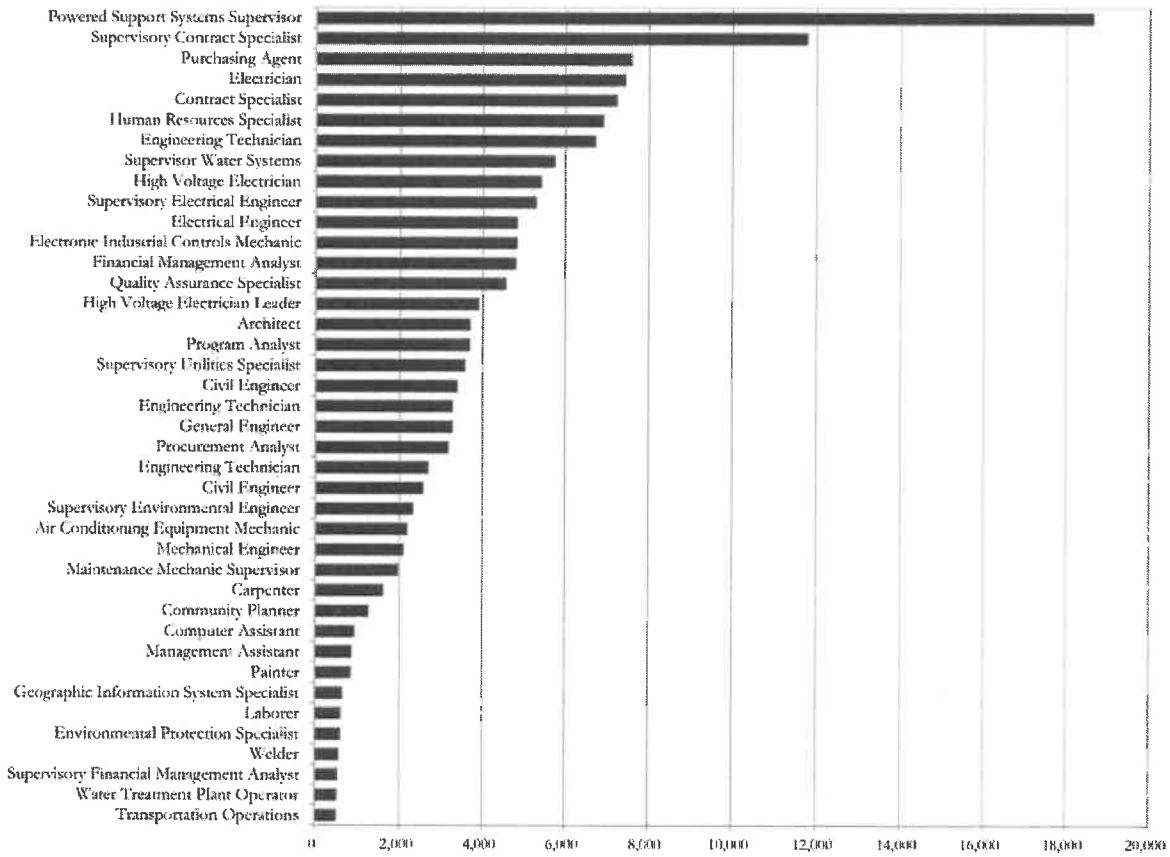


Figure 12. NAVFAC: Average 2015 annual overtime compensation ($)

3.4. Intelligence

In this section, we review one organization, U.S. Army Intelligence and Security Command, from the Intelligence category. The objective of this section is to capture personnel data for intelligence related occupational groups, but we continue to use any qualifying civilian-contractor comparisons outside of this functional group as well. Ideally, we would include more than one organization for a better representative sample; therefore, we do not make broad conclusions about personnel costs in the DoD intelligence community.

3.4.1. U.S. Army Intelligence and Security Command

At the end of fiscal year 2015, there were (b)(4) DoD civilians employed with U.S. Army Intelligence and Security Command (INSCOM) Headquarters at Fort Belvoir, Virginia. There were (b)(4) DoD

civilians employed at INSCOM National Ground Intelligence Center (NGIC) at Rivanna Station in Charlottesville, Virginia. INSCOM initially identified six comparable functions with (b)(4) civilian FTEs and (b)(4) contractor FTEs for analysis. Approximately (b)(4) (b)(4) civilians in this analysis are located at Fort Belvoir and (b)(4) at Rivanna Station. A slightly larger percentage ((b)(percent) of contractors is from Rivanna Station.

Description of Cost Comparisons

The comparable functions identified by INSCOM are predominately from the Information Technology (2200), Social Science, Psychology, and Welfare (0100), and Business and Industry (1100) civilian occupational groups. Civilian personnel from the Engineering and Architecture (0800) and General Administrative, Clerical, and Office Services (0300) occupational groups and the Electrical Installation and Maintenance (2800) occupational family are represented in smaller numbers. All of the civilian personnel from Fort Belvoir and Rivanna Station are in the Excepted Service under the Defense Civilian Intelligence Personnel System (DCIPS), which uses the General Government (GG) Pay Plan and follows the General Schedule grade and step structure.

All of the identified functions are in the final dataset that we use for comparisons. The largest numbers of civilian employees are employed in Information Technology Management (2210), Intelligence (0132), and Contracting (1102) occupational series.

Cost Comparisons

Table 38 and Table 39 display six comparable functions analyzed within INSCOM. No functions are excluded from this table; however, data for individual civilians and contractors are excluded if an individual does not have full annual payment.

Table 38. Average cost of comparable positions at INSCOM (Civilian $ > Contractor $)

Location	Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CIV/CTR)
Fort Belvoir	Electrical Engineer/General Engineer	(b)(4)				1.06
Fort Belvoir	Intelligence Specialist/IT Specialist					1.08
Fort Belvoir	Intelligence Specialist					1.19
Fort Belvoir	IT Specialist/Supervisory IT Specialist					2.48

Table 39. Average cost of comparable positions at INSCOM (Contractor $ > Civilian $)

Location	Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CTR/CIV)
Rivanna Station	Information Technology (IT) Specialist	(b)(4)				1.01
Fort Belvoir	IT Specialist/Contract Specialist					1.39

The civilian-contractor cost ratios for the INSCOM comparisons in Table 38 and Table 39 indicate that more frequently, civilians cost more than contractors in terms of fully burdened cost. Four out

of six comparisons have average civilian costs that are greater than average contractor costs.[31] For two comparisons in Table 38, the average civilian costs are more than 10 percent greater than the average civilian costs. Three comparisons, IT Specialist (2210) at Rivanna Station, Electrical Engineer/General Engineer (0850/0801), and Intelligence Specialist/IT Specialist (0132/2210) have average civilian and contractor costs that are within a 10 percent difference. In Table 39, the average contractor costs for comparable IT Specialist and Contract Specialist (1102) functions are 39 percent greater than civilian costs.

Figure 13 displays the average overtime pay for functions at INSCOM. The overtime chart represents the average amount of overtime pay by function and excludes functions with average overtime values less than $500. Overtime pay averages include data for individuals who did not receive overtime pay. Overtime pay is not a significant element of compensation for most INSCOM employees as less than 20 percent of the civilians included in our study received overtime pay in 2015.

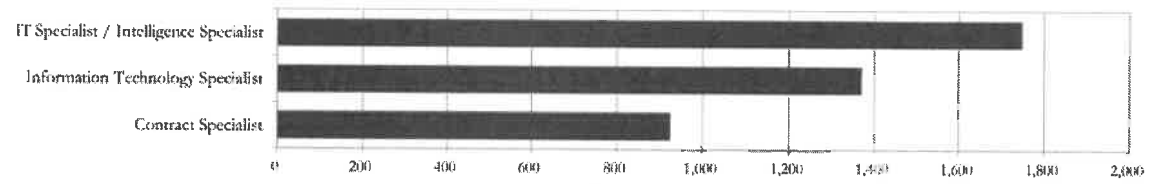


Figure 13. INSCOM: Average 2015 annual overtime compensation ($)

3.5. Installation and Base Support

In this section, we review two organizations that we categorize as installation and base support, Navy Installations Command and 75th Air Base Wing. The objective of this section is to capture functions related to facilities and installation maintenance but we also include additional qualifying civilian-contractor comparisons. Functions are described using civilian occupational groups, families, and series, for consistency in terminology.

3.5.1. Navy Installation Command

At the end of fiscal year 2015, there were 449 DoD civilians employed at Navy Installations Command in Guam and 826 DoD civilians employed at Navy Installation Command in Hawaii. Commander, Navy Installation Command (CNIC) initially identified nine comparable functions with (b)(4) civilian FTEs and (b)(contractor FTEs for analysis. The majority of the civilian and contractor FTEs, (b)(and (b)(4) respectively, are located in Hawaii.

[31] The comparison for IT Specialist/Supervisory IT Specialist (cost ratio = 2.48) is classified as a statistical outlier in the boxplot diagram for INSCOM in Section 4. Outliers are defined as observations that are at least 1.5 times the interquartile range (Q3 – Q1) from the edge of the interquartile box.

Description of Cost Comparisons

The nine comparable functions identified by CNIC are predominately from three civilian occupational groups: Transportation (2100); Social Science, Psychology, and Welfare (0100); and Information Technology (2200). Six of the functions are located in Hawaii, and three are in Guam. The largest functional areas are Emergency Vehicle Dispatcher (2151) and Social Work (0185). All of the CNIC civilian personnel included in this analysis are employed in the General Schedule pay system.

A total of five functions are in the final dataset that we use for comparisons as a result of data exclusions. Four of the nine functions do not have both civilian and contractor representation; therefore, they are excluded from subsequent analysis. For example, there are [redacted] civilian Social Workers located in Hawaii without contractor counterparts.

Cost Comparisons

Table 40 and Table 41 display five comparable functions analyzed within CNIC. Functions are excluded from this table if there are not comparable civilian and contractor functions in the same location or if either side of the comparison does not have full annual payment data. The data is retained in the database for potential comparisons with civilians or contractors at different organizations and locations.

Table 40. Average cost of comparable positions at CNIC (Civilian $ > Contractor $)

Location	Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CIV/CTR)
Guam	IT Specialist (Systems Administration)	(b)(4)				1.08
Guam	IT Specialist (Project Management / Systems Administration)					1.27
Hawaii	Human Resources Specialist					8.14

Table 41. Average cost of comparable positions at CNIC (Contractor $ > Civilian $)

Location	Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CTR/CIV)
Hawaii	Telecommunication Specialist	(b)(4)				1.07
Hawaii	Emergency Vehicle Dispatcher					1.16

The civilian-contractor cost ratios for the CNIC comparisons do not allow us to conclude that civilians or contractors are generally more expensive. The outcomes depend on the functions being performed, but do indicate that civilian IT Specialists in Guam are generally more expensive than comparable contractors. These results could be more sensitive to location than the characteristics of the jobs being performed.

Of 5 comparable functions, 3 functions (or positions), shown in Table 40, have average civilian costs that are greater than the comparable contractor costs. Both IT Specialists functions, which are within the Information Technology Management (2210) occupational series, have greater civilian than contractor costs. The cost ratio for the Human Resources Specialist (0201) comparison is extremely high due to the low contractor cost. Although there is no evidence to suggest inaccuracy associated

with the calculation, we have excluded this ratio as an outlier in the aggregate results presented in Section 4. In Table 41, one comparison, Telecommunication Specialist (0391), has average civilian and contractor costs that are within a 10 percent difference.

Figure 14 shows the average overtime pay for CNIC civilians in this analysis, excluding individuals in the Telecommunication Specialist comparison, which recorded no overtime. Overtime pay is a significant component of total compensation for civilians in the Emergency Vehicle Dispatcher occupational series. Relative to an average cost of $66,260, emergency vehicle dispatchers generated an average of $6,997 in overtime pay, increasing the fully burdened cost by more than 10 percent when extending beyond standardized annual hours. The overtime pay of $5,342 for civilian Human Resource (HR) Specialists is the only other significant exclusion to fully burdened civilian costs in our comparison of civilian-to-contractor costs. (b)(4)

(b)(4)

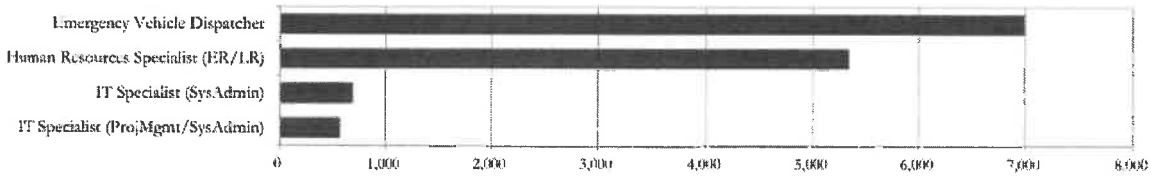


Figure 14. CNIC: Average 2015 annual overtime compensation ($)

3.5.2. 75th Air Base Wing

At the end of fiscal year 2015, there were 1,239 DoD civilians employed in the 75th Air Base Wing (ABW) at Hill Air Force Base, Utah. The 75th ABW initially identified nine comparable functions with 48 civilian FTEs and 55 contractor FTEs for analysis. The majority of the 75th ABW civilian personnel included in this analysis are employed under the General Schedule pay system; however, (b)(4) personnel fall under the DoD Acquisition Workforce pay scale as Business/Technical Management Professional (NH) employees and (b)(4) within the Federal Wage System.

Description of Cost Comparisons

The nine comparable functions identified by CNIC are predominately from the Medical, Hospital, Dental, and Public Health civilian occupational group. Six additional civilian occupational groups and families are included in the comparisons: Social Science, Psychology, and Welfare (0100); General, Administrative, Clerical, and Office Services (0300); Accounting and Budget (0500); Equipment, Facilities, and Services (1600); Information Technology (2200); and General Maintenance and Operations Work (4700). Sorted by occupational series on the civilian side of the comparisons, the largest representations are from the Nurse (0610) and Health Systems Specialist (0671).

Cost Comparisons

Table 42 and Table 43 display the nine comparable functions analyzed in the 75th ABW. All nine functions are in the final dataset that we use for comparisons. Data for individual personnel is excluded if they had less than a full year of employment with the organization.

Table 42. Average cost of comparable positions at 75th ABW (Civilian $ > Contractor $)

Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CIV/CTR)
Medical Management Nurse	(b)(4)				1.04
Family Practice Nurse					1.07
Pharmacist					1.12
Pharmacy Technician					1.23
Administrative Support					1.23

Table 43. Average cost of comparable positions at 75th ABW (Contractor $ > Civilian $)

Civilian Position Title	Civilian ($)	n	Contractor ($)	n	Cost Ratio (CTR/CIV)
Health Services Management	(b)(4)				1.07
Psychologist					1.13
Medical Technician					1.21
Facility Management					1.24

The cost ratios for the 75th Air Base Wing comparisons in Table 42 and Table 43 suggest that, more often than not, civilians cost more than contractors. As with previous examples, the outcomes appear to depend on the functions being performed. Table 42 displays the five comparisons of functions (or positions) that have greater civilian costs than contractor costs. The greatest differences are among the Administrative Support (0318) and Pharmacy Technicians (0661) functions, where the civilian costs are 23 percent greater than contractor costs, on average. Four comparisons in Table 43 have average contractor costs that are greater than comparable civilians. One comparison, Health Services Management (0301/0343/0503/0560/0671/0675/0679/2210), in Table 43 has average civilian and contractor costs that are within a 10 percent difference. The highest cost ratio in Table 43 is for Facility Management (1640/4749), where the average contractor cost is 24 percent greater than the average civilian cost.

Overtime pay is not a significant component of overall compensation for DoD civilians in the analysis of 75th ABW. The exclusion of this cost element has a negligible impact on the fully burdened costs of the civilians in these comparisons. At $670, only one function, Pharmacist, recorded average annual overtime pay higher than $500. Six of the nine functions recorded zero overtime pay.

3.6. Child Development Centers

The operation of child development centers (CDCs) uses a personnel management structure that does not lend to adequate cost analysis using the standard methodology of this study.

The rate of wages and benefits for staff at CDC sites that are operated by contractors is unknown; the contracts are awarded with a price per-child per-month fee. Therefore, we take a different approach to analyzing CDCs than we used for the remainder of the study. We calculate the cost per child on an annual and monthly basis in lieu of the standard methodology outlined in Section 2. Rather than comparing functions by the cost per full-time equivalents, for CDC comparisons, we calculate the cost to DoD per child at each site.

We analyzed government owned and operated CDC facilities located at DLA Distribution Susquehanna and DLA Distribution San Joaquin, and contractor operated sites at Defense Supply Center, Columbus, Ohio, and Defense Supply Center Richmond, Virginia. As with the standard methodology, we use calendar year 2015 data for all CDCs.

3.6.1. CDC Cost Structure

The cost to operate CDCs is a function of several elements that are defined by statute and DoD policy. A subset of these elements is listed in Table 44.

Table 44. CDC operating cost elements

Element	Description
Age Group	Age grouping of each room (infant, pre-toddler, toddler, pre-school)
Room Capacity	Capacity of each room in a CDC
Staff Size	Number of staff based on the age group and number of children in the room
Staff Ratio	Required ratio of caregiver-to-child based on age
Configuration	Command and control staffing configuration based on the size of a CDC
Staff Qualifications	Qualifications, education level, and training requirements for all employees
Statute	Service Contract Act of 1965, as amended for care givers, food service personnel and administrative staff at the contractor operated sites
Location	Standardized pay based on the OPM salary tables for a geographic location
Patron Fees	Sliding scale of patron fees based on total family income
Registered patrons	Number of registered patrons in each category received by each CDC

Our analysis assumes that that all CDCs are staffed at the proper caregiver-to-child ratio required by policy. This assumption is reasonable due to the oversight that takes place at multiple levels, regardless of whether the CDC is government or contract operated. We use actual patronage data, which are collected and reported by the DLA Child and Youth Program Office to DoD. We also include non-appropriated fund (NAF) financial statements in our assessments of the government-operated sites.

Government Operated Sites

Costs associated with government operated sites at Susquehanna and San Joaquin reflect actual monthly data obtained from DLA. The elements associated with income and operating costs exclude operating expenses for General Ledger Account Code 742, which is the cost of furniture, fixtures, and equipment, purchased for the CDC operations. We exclude these costs from our analysis of