

1. INTRODUCTION

The Navy Cost of Manpower Estimating Tool (COMET) was developed to enable defense contractors and Navy cost analysts to accurately and consistently estimate personnel-related costs associated with the acquisition process. The program allows users to view the direct and variable indirect costs associated with an individual and also, to view final variable costs for specific skill groups. Users can view all-Navy costs as well as occupation-specific costs. With this capability, system developers and project officers are able to assess the economic impact on life cycle costs of hardware/manpower tradeoff alternatives.

The COMET program is a Windows95 program. The data files are quite robust, and considerable experimentation is possible with no danger of corrupting the underlying cost data. From the user's point of view, COMET is divided into three functional parts: (1) individual billet data, (2) final cost file creation/modification, and (3) life cycle cost modeling. Individual billet data may be viewed down to the level of specific variable costs by selecting a rating or designator. Individual average costs per pay grade may be viewed as well. Final cost file creation/modification allows the user to create a final cost estimate using assumptions other than the COMET defaults. These files are then available as cost "building blocks" and are used by analysts in creating a variety of costing scenarios.

The COMET Civilian Component model was developed in much the same manner as the Active and Reserve Component models. However, the Navy's civilian personnel system differs significantly from those operating within the active and reserve communities. The underlying methodology was developed with this in mind, while retaining the format, appearance, and overall design of the other models. Users will observe only minor changes in the way the data and model options are presented.

The program stores all of the fixed data required for manpower cost estimates in an underlying Microsoft Access database. The data are used largely, but not exclusively, within the policy modules, which are essentially sets of equations that simulate personnel policies to generate manpower costs. Data originated primarily from two sources: (1) the Civilian Master File, residing at the Defense Manpower Data Center (DMDC); and (2) published sources, such as the *Federal Employees Almanac* and the "on-line" bulletin board posted by the Office of Personnel Management, that contain data on pay rates and retirement benefits. Other data originate from an assortment of Office of Management and Budget (OMB) publications and personal contacts at the Navy Annex; Appendix A provides greater source detail.

The structured cost database contains a set of cost estimates that can be manipulated to fit a wide variety of user-defined scenarios. It includes all the cost data used by the model. This data is applied to a set of user-specified requirements by grade, skill, and year. The model computes the product of these factors and then provides users with annual manpower costs aggregated across skill, appropriation, and year.

The structured cost database contains annualized costs for both General Schedule (GS) and Wage Board (WB) schedules—by skill and grade—for all full-time permanent employees.

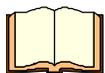
The model produces its estimates by matching the appropriate costs from the final cost file with the user-supplied manpower requirements, then calculating a product. Within this approach, the data from the final cost file represents the “price” of an individual to fill a manpower requirement. This three-dimensional matrix (skill by grade by budget appropriation) is multiplied by the requirements matrix (skill by grade by year) and the product of the two provides the model’s output (skill by grade by year), which is the cost of manpower for a given weapon system over time. COMET can generate this time-phased profile of the manpower costs over the life cycle of either a materiel system or an organization.

The model provides users with several options for modifying the default costs so that the appropriate costs can be applied to each specific scenario. In addition to inputting the manpower requirements for each year in the life cycle, users may define a discount rate and inflation rates for the first 5 years of the cost estimation (the inflation rate of the fifth year is carried through to the last year of the cost estimation); however, default rates that match those published by OSD/OMB are provided initially by the model. The user also will have the option of specifying which budget appropriation provides the dollar outlays for the employees’ pay and allowances within a given organization.

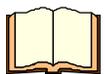
1.1 COMET PROGRAM DOCUMENTATION

There are separate cost estimation modules for the Navy’s Active Duty, Reserve, and Civilian components. Since each component has both an *Operations Manual* and a *User’s Manual*, the entire COMET Program documentation set encompasses six manuals, as shown below:

Active Component:

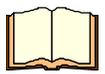


Active Component Operations Manual

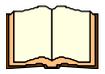


Active Component User’s Manual

Reserve Component:

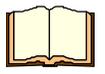


Reserve Component Operations Manual

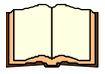


Reserve Component User’s Manual

Civilian (Government employees) Component:



Civilian Component Operations Manual (this document)



Civilian Component User’s Manual

1.2 PURPOSE OF THIS MANUAL

This manual, intended for use as a precursor to the *Civilian Component User's Manual*, describes data flows, algorithms, and processes used in calculating costs for COMET. Readers of this manual will better understand how the model works, under what circumstances the model is used, and the methodology and data sources used in the model. By reviewing this information prior to using the model, the user will be equipped to use the model appropriately. It is intended to provide enough information to allow for updates of the various cost modules and permit critique through full disclosure of underlying assumptions, by explaining how the equations associated with the different cost modules are derived. It also provides information on data sources.

Please contact SAG Corporation (703-538-4500) for further information, if necessary.

1.3 ORGANIZATION OF THIS MANUAL

The remainder of this manual is organized as follows:

- Section 2 presents a listing of the notation used both in the software and in the cost modules.
- Section 3 details how each policy module draws data from underlying databases, how Civilian component compensation and personnel systems are simulated, and how cost flows operate in the structured cost database.
- Section 4 discusses cost options currently employed by the model.
- Appendix A provides the data sources for each variable.
- Appendix B contains a list of available GS-schedule job categories.
- Appendix C lists the Metropolitan Statistical Areas used to compute locality pay for GS schedule employees and the 135 wage areas applicable to “wage board” system employees.

2. COMET POLICY MODULE NOTATION

This section presents the notation used in the discussions of the individual policy modules. Note that all costs are annual costs. In addition to the notation linked to each policy module, the following is global notation:

AC	= Average Cost
i	= Index of step
j	= Index of grade
k	= Index of skill

2.1 BASE SALARY

AC_{jk}^{BS}	= Average cost of base salary for civilians in grade j and skill k
b_{Sijk}	= Base salary rate for civilian employees at step i, grade j, and skill k
C_{ijk}	= Inventory of civilians at step i, grade j, and skill k
LP	= Locality Pay Multiplier
GS	= General Schedule
SES	= Senior Executive Service
WB	= Wage Board
WG	= Wage Board Employee
WL	= Wage Board Lead Employee
WS	= Wage Board Supervisor

2.2 RETIREMENT BENEFITS

AC_{jk}^{NRet}	= Average cost to the Navy for providing retirement benefits to a civilian in grade j and skill k
AC_{jk}^{ORet}	= Average cost to Office of Personnel Management (OPM) for providing retirement benefits to a civilian in grade j and skill k
G_N^{CSRS}	= Navy's contribution to the Civilian Service Retirement Service (CSRS)
G_o^{CSRS}	= OPM's contribution to CSRS
G_N^{FERS}	= Navy's contribution to the Federal Employee's Retirement System (FERS)
G_o^{FERS}	= OPM's contribution to FERS
r^{CSRS}	= Retirement pay rate for CSRS
r^{FERS}	= Retirement pay rate for FERS

2.3 PREMIUM PAY

AC_{jk}^{Prem}	= Average cost of premium pay for grade j and skill k
AC_{jk}^{BS}	= Average cost of base salary for civilians in grade j and skill k
r^{Prem}	= Premium pay rate
p^{Prem}	= Probability of receiving premium pay
$HrsWk$	= Average number of hours worked per week by employees receiving premium pay

2.4 OTHER BENEFITS

AC_{jk}^{OB}	= Average cost of other benefits for civilians in grade j and skill k
OB_{tot}	= Total amount spent by the Navy on other benefits

3. DISCUSSION OF COST POLICY MODULES

This section outlines the COMET Civilian Component modules individually. Each description addresses a module and may contain the following information:

- Composition - discussion of the specific policy that generates that manpower cost.
- Average Cost Computation - discussion of the methodology used to calculate the average cost for a specific policy (note that all costs are categorized as either direct or variable indirect).
- Notation - lists definitions of variables used in the text.

The current list of policy modules includes:

- Base Salary (*see Section 3.1*)
- Retirement Benefits (*see Section 3.2*)
- Premium Pay (*see Section 3.3*)
- Other Benefits (*see Section 3.4*)

There are place holders in the model for recruiting and training costs should this data become available.

3.1 BASE SALARY

3.1.1 Composition

Base salary is considered a direct cost. A variety of compensation systems exist that are used by the government to pay its employees. The two following methods are represented in the COMET Civilian Component (COMET-C):

1. *General Schedule (GS)*. GS schedule employees currently comprise approximately 72% of the Navy's civilian workforce. GS "white-collar" salaries are based on equal pay for equal work, with differences in pay based on differences in work and performance and on comparability to the salaries that private-sector employees are paid for work at the same level of difficulty and responsibility. Prevailing private sector wage rates are established using a survey of local wage areas. Within the general schedule are the salary rates for GS, GM (GS-13 through GS-15 being paid as supervisors or managers), and SES (Senior Executive Service). The salary rates included in the GS pay tables are annual rates and are established by the President pursuant to law.

GS pay tables also reflect locality pay that was authorized by the 1990 Federal Employees Pay Comparability Act (Public Law 101-509). Locality pay is considered base pay in both retirement and premium pay calculations. As of 1997, there were 28 metropolitan zones in which employees are paid at a different rate than workers falling into the "Rest of the U.S."

(RUS) category. COMET can easily be updated in the future simply by entering new GS pay rates into the underlying cost database.

2. *Prevailing Rate or Wage Board (WB)*. These employees, commonly referred to as the “blue collar” workers, currently comprise about 28% of the Navy’s civilian workforce and are paid based on prevailing, area-specific rates. This pay system covers trade, labor, and other crafts occupations. WB employees are paid on an hourly basis and receive annual wage raises based on a review of comparability pay by each area. The WB pay scale is divided into three basic classes: (1) WG (employee), (2) WL (lead employee), and (3) WS (supervisor); each is represented in pay tables by a 5-grade by 15-step matrix.

3.1.2 Average Cost Computation

For GS employees, the calculation of average costs of salary entails a straightforward application of the pay tables to the existing inventory of employees as of the end of FY97. The inventory of employees is organized into a matrix dimensioned by skill, grade, and step. The model multiplies the inventory in each cell by the appropriate pay rate, accumulates costs across step, then divides the total by grade inventory to obtain a weighted average salary by grade and skill.¹ The average cost of an individual in grade *j* and occupation (or skill) *k* is calculated using the following equation:

$$(3.1.1) \quad AC_{jk}^{BS} = \frac{\sum_{i=1}^{10} (bs_{ijk} \cdot C_{ijk})}{C_{jk}} \cdot LP$$

where AC_{jk}^{BS} is the average cost of base salary for civilians in grade *j* and skill *k*; bs_{ijk} is the base salary rate for civilian employees in step *i*, grade *j*, and skill *k*; C_{ijk} is the inventory of civilians in step *i*, grade *j*, and skill *k*; and LP is a locality multiplier that is activated upon specification of a geographic area. The default value for LP is 1.0067, which corresponds to the “Rest of the U.S.” wage area.²

For WB employees, calculation of the average salary cost is only slightly more involved. COMET-C contains the wage board WG, WL, and WS pay schedules for each of the 138 wage areas, including Hawaii, Alaska, and Puerto Rico, in the underlying database. The calculation of the average cost of salary proceeds in the same manner as that of the GS employee, except it is done by grade, step, and wage area, rather than by grade, step, and occupation.

¹ For any GS skill or WB area where an inventory exists, the model only displays average costs for those grades that have an inventory. For user selected GS skills for which no inventory exists, the “all Navy” step distribution (grade specific) is assumed for each grade. For WB areas with no inventory, the all occupation inventory is assumed. The program indicates these no inventory cases to the user with a message box.

² “On screen,” SES employees are represented as grade 16. The step distinction for this class is different (1 through 6) from other GS workers. In calculating average cost for this small group, a modal value for salary (\$107,300 as of 1995) is used instead of an average step calculation.

3.2 RETIREMENT BENEFITS

3.2.1 Composition

The retirement benefit is classified as a direct cost. The model incorporates costs associated with both retirement systems that are currently in effect, the Civil Service Retirement System (CSRS) and the Federal Employees' Retirement System (FERS). The CSRS was the retirement plan used for most employees hired prior to 1984. Since 1984, individuals rehired into the government with fewer than five years of civilian service and those persons covered by Social Security have been covered by FERS. In addition, there was a one-time opportunity in 1987 for those covered by CSRS to transfer to the new system. Although the FERS is the official retirement system, there is a mix of employees covered under each system.

The CSRS provides optional unreduced retirement at age 55 with 30 years service, or age 62 with at least 5 years service; involuntary retirement at any age after 25 years service or at age 50 with 20 years service. Deferred annuities are payable at age 62 with 5 years service. There no longer is a mandatory retirement age, except for certain special groups of government employees such as law enforcement personnel. The annuity formula provides 1.5% of average salary for the first 5 years service, 1.75% for the next 5 years and 2% per year for any remaining service, up to a maximum 80% of average salary. Disability annuities receive the greater of the preceding computation or a guaranteed minimum basic disability annuity. The actuarial department of OMB calculates that the dynamic normal cost for CSRS is 25.14% of the employee's salary.³ The employee contributes 7% of this amount, the employing agency contributes a matching 7%, and the Office of Personnel Management (OPM) contributes the remainder (11.1%).

There are three major components to the FERS retirement plan: Social Security coverage, a basic annuity plan similar to the CSRS benefit (but smaller), and a thrift-savings plan. Under the first tier of Social Security, employees are prospectively covered by the Social Security System (implying that the employing agency will contribute 7.65% of an employee's salary for 1990 towards this program). Any prior Social Security is added to coverage gained under FERS. The second tier of the plan guarantees a specific monthly payment at specific ages based on years of service and is basically paid for by the employing agency. OMB estimates that the dynamic normal cost for this annuity is 12.2% of an employee's salary. The employing agency already contributes 6.2% under Social Security and, therefore, must contribute an additional 0.8%, for a total of 7%. This implies that OPM contributes 10.6% ($12.2 - 2 * 0.8$). Under the third tier of the plan, FERS employees are able to shelter portions of their salaries from taxes and have the government match the amounts. The employing agency must contribute 1% of salary and could contribute up to an additional 4%. Thrift Plan is 3.4% (agency average).

3.2.2 Average Cost Computation

For the default values of retirement costs, the model applies two factors that incorporate the appropriate mix of CSRS and FERS employees. The first factor estimates the cost to the Navy

³ This means that, for a new employee, the total cost of retirement would, on average, be covered by a contribution equal to 25.14% of his/her annual pay.

and the second factor estimates the remaining costs to the government. The model uses the rules stated above to calculate a rate for each plan alone and then calculates a weighted average based on the mix of retirement plans currently obtaining among the Navy’s civilian workforce population, as represented by the most recent available DMDC data.

$$(3.2) \quad AC_{jk}^{NRet} = ((G_N^{CSRS} \cdot r^{CSRS}) + (G_N^{FERS} \cdot r^{FERS})) AC_{jk}^{BS}$$

$$AC_{jk}^{ORet} = ((G_O^{CSRS} \cdot r^{CSRS}) + (G_O^{FERS} \cdot r^{FERS})) AC_{jk}^{BS}$$

AC_{jk}^{NRet} is the average cost to the Navy of providing retirement benefits to a civilian in grade j and skill k (or, in the case of WB workers, wage area k); AC_{jk}^{ORet} is the average cost to OPM of providing retirement benefits to a civilian in grade j and skill k ; G_N^{CSRS} is the Navy’s contribution to CSRS; G_O^{CSRS} is OPM’s contribution to CSRS; G_N^{FERS} is the Navy’s contribution to FERS; G_O^{FERS} is OPM’s contribution to FERS. Contribution calculations are based on OPM’s dynamic normal costs, which are actuarial rates. The r terms reflect the percentage of employees enrolled in each retirement plan.⁴

3.3 PREMIUM PAY

3.3.1 Composition

Premium pays are classified as a direct cost. Premium pays compensate employees working difficult or inconvenient schedules and who work in specially designated fields or locations. Premium pays are paid as a percentage of the basic annual salary (not a fixed amount), and are broken into the following categories:

- *Overtime Pays.* Paid for working in excess of a standard 8 hours per day, or 40 hours per week, in accordance with 5 U.S.C. 5542, at the hourly rate of 1.5 times the regular hourly rate of base pay where for employees earning a basic annual salary up to and including GS10, step 1. Where base pay exceeds this level, overtime pay, when claimed, is paid at the rate assigned to GS10, step 1 times 1.5. No overtime entitlements exist for those employees with total pay for any period that exceeds the maximum payable rate at the GS15, step 10 level. No premium payments or compensation time may be granted to employees whose rates of basic pay for any pay period are more than the maximum rate for a GS15. This rule does not apply to overtime pay received under the Fair Labor Standards Act (1974 amendments).
- *Availability Pay.* Pertains to law enforcement, protective, and certain other employees. These earnings are not considered in retirement computations.
- *Sunday Work.* Full-time employees are paid an additional .25 of the basic pay rate when a regularly scheduled work week includes Sunday (*i.e.*, a work week that includes Sunday).

⁴ As of FY1995, 50.75% of the Navy’s GS employees were covered under CSRS ($r^{CSRS} = .5075$) and 49.25% were covered under FERS ($r^{FERS} = .4925$). Among WB employees, 64.37% are CSRS and 35.63% are FERS.

- *Holiday Pay.* Paid to employees for duty on designated federal holidays if they fall within the designated workweek, and paid at 2.0 times an employee’s rate of basic pay.
- *Night Differential.* Employees are paid an additional 7.5 – 10% of basic pay for work between 6:00 p.m. and 6:00 a.m. if the regular tour of duty, or any part of it, falls between those hours.

3.3.2 Average Cost Computation

To calculate the average cost of premium pays, the model applies a premium pay rate that reflects the premium pay types and levels activated in the user’s requirement-specification. Specification may include some or all of the above categories of premium pay. Users may input precise data regarding the type and number of premium hours to be worked. The model calculates a precise value for premium pay based on Tables 3-1 and 3-2, below. Note that not all premium pays are included in the “base salary” figure used to calculate benefits (such as retirement).

Table 3-1 General Schedule Premium Pay

Premium Pay	Rate	Benefits
Overtime	150%	No
Availability Pay	125%	Yes
Standby Pay	125%	Yes
Sunday Work	125%	No
Holiday Pay	200%	No
Night Pay	110%	No
Allowances/Differential for Remote Duty	125%	No
Pay for Irregular Hardship/Hazard Duty	125%	Yes

Table 3-2 Federal Wage Scale Premium Pay

Premium Pay	Rate	Benefits
Overtime	150%	No
Sunday Work	125%	No
Holiday Pay	200%	No
Night Shift Differential (3 p.m.–1 a.m.)	107.5%	Yes
Night Shift Differential (11 p.m.–8 a.m.)	110%	Yes
Environmental Differential	108%	Yes
Area Differential Rates	108%	No

The model calculates the average cost of premium pay as

$$(3.3) \quad AC_{jk}^{\text{Prem}} = AC_{jk}^{\text{BS}} \cdot \frac{HrsWk}{40} \cdot r^{\text{Prem}} \cdot p^{\text{Prem}}$$

where AC_{jk}^{Prem} is the average cost of premium pay for grade j and skill k; $HrsWk$ is the average number of premium hours worked per week for employees who receive premium pay; r^{Prem} is the rate at which premium pay is paid, given than an employee receives premium pay; and p^{Prem}

is the probability of receiving premium pay. Users specify types of premium pays to be included and the probability of receiving the pays; the default value assumes no premium pays.

3.4 OTHER BENEFITS

3.4.1 Composition

Other benefits are classified as a direct cost. This module includes separate costs for Federal Employee Group Life Insurance (FEGLI), Federal Employee Group Health Insurance, and miscellaneous costs (uniforms, overseas allowances, incentive pays, PCS costs, etc.).

3.4.2 Average Cost Computation

Except for health insurance benefits, the average cost of other benefits is calculated by dividing the total number of dollars spent for each category of other benefits awards by the total dollars spent on base salaries to obtain a percentage of base salary. This calculated rate is then multiplied by the average salary for a given grade, skill combination.

$$(3.4) \quad AC_{jk}^{OB} = \left(\frac{OB_{tot}}{\sum_j \sum_k AC_{jk}^{bs}} \right) AC_{jk}^{bs}$$

AC_{jk}^{OB} is the average cost of other benefits for civilians in grade j and skill k, and OB_{tot} is the total dollars spent by the Navy on other benefits.

Health insurance benefit costs differ by pay system (GS and WB), but are assumed to cost the same per employee within each system. The Navy funds all costs for other benefits.

4. COST OPTIONS

In addition to the default final cost file that the COMET Civilian model applies to manpower requirements, the model offers the user the option of modifying these costs so that the appropriate combination can be applied to the user's scenario. This section discusses cost options currently employed by the model, as well as the methodologies underlying certain cost options that Navy manpower analysts may wish to implement in future versions of the COMET Civilian model.

4.1 MODIFYING THE DEFAULT DATA

Users may run the cost estimation with minimal effort by employing the default settings available in a number of modules. However, for specific applications, it may be more appropriate for users to adjust certain elements which effect the cost calculation procedure. Some of the ways in which an application can be tailored to a particular application are:

- *Retirement Costs.* The model uses a factor that reflects the current distribution of employees covered under CSRS and FERS, but the user is provided the option of defining a different mix of CSRS and FERS employees.
- *Cost Component Selection.* By default, the model includes all cost categories in its calculations. The user may disable specific cost categories by selecting and excluding them from the cost calculations. Disabled costs may be reintroduced into the calculations simply by re-enabling them.

4.2 FUTURE OPTIONS

The model currently does not provide the following options, but the discussion is an indication of the types of additional features that could be incorporated into the model should users require it to do so.

In addition to allowing the user to modify the already existing default costs, the model could allow the user to estimate the personnel costs of certain special cases, such as base realignments or OMB Circulation A-76 cost comparisons. Each case is summarized below:

- *Reduction-in-Force.* A RIF may be required when a function is eliminated, thereby eliminating federal jobs. The model provides the basic structure to allow users to define the RIF population and then apply the specific costs associated with the RIF.
- *Cost Comparisons.* This option is related to the RIF in that an A-76 cost comparison is used when a function is being retained, but when the associated government *positions* are under considered for elimination. This option allows the user to compare the costs of maintaining a function in-house versus contracting the function to the private sector.
- *Realignment.* A broader special case category, which sometimes includes the RIF and A-76 cost comparisons, this option would allow the user to determine both PCS costs and separate costs associated with the realignment of installation functions. It also allows the user to determine whether or not it is more cost effective to contract out.

The model has been built to allow the following modules to be added should the necessary data become available:

- *Acquisition Costs.* The recruiting and acquisition of additional civilian employees is not an inconsequential problem in certain occupations and localities. The data needed for this module would include costs by grade and occupation for all of the different components of civilian acquisition preferably over an extended period of time.
- *Training Costs.* The cost of training civilians varies greatly based not only on occupation and grade, but also on the employee's previous job experience and educational attainment.

4.3 COST CALCULATIONS FOR FUTURE OPTIONS

4.3.1 PCS Costs

Whenever any of the special cases described above require the movement of an employee and the employee's household, the user will need to determine the costs of PCS.⁵ PCS costs are broken into six elements:

1. Travel to seek a residence
2. Expenses related to the sale and purchase of a home
3. Movement of household goods
4. PCS per diem
5. Miscellaneous expenses incidental to relocation
6. Temporary quarters allowance

4.3.1.1 Travel to Seek a Residence

A module could be added that calculates a cost based on assumptions concerning the average time spent seeking a new residence (say, 7 days; the maximum allowable is 10 days) and distance traveled (say, 1,500 miles). Costs would be calculated by multiplying the appropriate mileage rate by the mileage traveled (or using round-trip airfare) and adding that product to the per diem costs:

$$(4.3.1) \quad AC^{\text{Pr eMove}} = r^M \cdot M + r^{PD}$$

where $AC^{\text{Pr eMove}}$ is the average cost of pre-move travel, r^M is the mileage rate for the travel, M is the amount of miles traveled, and r^{PD} is the per diem.

4.3.1.2 Expenses Related to Sale and Purchase of Home

The government pays up to 10% of the selling price of an old residence (up to \$21,916) and 5% of the buying price of a new residence (up to \$10,959). For the default value, COMET-C could calculate this component of PCS costs assuming a national average price for selling a home and that an employee will receive the full 10% and 5% allowances.

4.3.1.3 Movement of Household Goods

The maximum weight allowance for any employee, with or without dependents, is 18,000 pounds. To estimate the cost per employee, the model uses the following equation:

$$(4.3.2) \quad AC^{HHG} = .75 \cdot AC_{off}^{OPS} - 100 \cdot (16 - n)$$

where AC^{HHG} is the average cost to move a civilian employee's household goods, AC_{off}^{OPS} is the average cost of a CONUS move for an active component officer, and n is the number of miles (in hundreds) in the move. The model also allows the user to input more precise values for the variables should such data be available.

4.3.1.4 PCS Per Diem and Mileage Allowance

COMET-C could calculate the default value for the average cost of per diem based on the following assumptions:

- The average PCS move is 1,500 miles

⁵ Normally, the cost of a PCS move is associated with a base realignment that requires the movement of civilians to another location to keep them employed. The user may want to estimate those costs or just determine the cost of moving a person from point A to point B.

- The average number of dependents is the same as the national average (1.64)

Thus, the calculation would look similar to the following:

$$(4.3.3) \quad AC^{PCS} = r^M \cdot M + (60 + 45d) \left(\frac{M}{350} \right)$$

where AC^{PCS} is the average cost of PCS travel, M is the number of miles traveled, r^M is the mileage rate (allowance per mile), and d is the number of dependents. Note that $M/350$ would be rounded to the nearest whole number.

4.3.1.5 Miscellaneous Expenses

COMET-C could calculate a default value of this variable based on an allowance of \$700 for employees with dependents and \$350 for those without dependents. This assumes that the mix of employees with and without dependents is 50/50; however, the user may input more precise information.

4.3.1.6 Temporary Quarters Allowance

In addition to the PCS costs, an employee is entitled to a temporary quarters allowance for a period not to exceed 60 consecutive days (on a case-by-case basis, the period may be extended an additional 60 days). This allowance is provided until the employee is settled into new quarters. COMET-C would assume that the average employee (with a spouse and one child) will take six weeks to get reestablished and will draw at a daily rate of \$143/day (\$66 + \$44 + \$33) in accordance with the following table. If available, more precise information could be used to compute TQA.

	Daily Draw	60 Day Max	120 Day Max
Employee	\$66	\$3960	\$7920
Spouse	\$44	\$2640	\$5280
Dependent 12 or over	\$44	\$2680	\$5280
Dependent under 12	\$33	\$1980	\$3960

4.3.2 RIF Costs

Reductions-in-force are actions that result in the involuntary separation of civilian employees. Career employees who are separated by a reduction-in-force are, in most circumstances, entitled by law to certain compensation. They may collect an immediate retirement annuity, if they are eligible, or severance pay, but typically not both. Analysts need not be so concerned with the amount of the annuity, as the cost of providing that annuity is taken into account under retirement benefits. However, the modelers may be interested in determining the costs of providing severance pay and terminal leave payments to eligible employees that are being RIFed.

To calculate the cost of severance pay, COMET would be implemented using assumptions concerning the RIFed employees, but the user would be allowed to substitute more precise information if it is available. The assumptions would likely be taken from the *Resource Factor Handbooks*.

Sample Severance Pay Assumptions:

- For major installations (commanded by an O-9 or higher), the average employee affected is a GS-8, step 5, 40 years old with 15 years of federal service and 240 hours of accrued leave.
- For all other installations, the average employee is a GS-5, step 5, 40 years old with 15 years of service and 200 hours of accrued leave.

To calculate the cost of severance pay, the model would use the following equation

$$(4.3.4) \quad AC^{Sev} = L \left(\frac{AC^{bs}}{2087} \right) + \begin{cases} Y^{FS} \left(\frac{AC^{bs}}{52} \right), & \text{for } Y^{FS} \leq 10 \\ 2(Y^{FS} - 10) \left(\frac{AC^{bs}}{52} \right) + 10 \left(\frac{AC^{bs}}{52} \right), & \text{for } 10 < Y^{FS} \leq 30 \end{cases}$$

where AC^{Sev} is the average cost of severance pay, Y^{FS} is the number of years of credible federal service, and L is the amount of unused leave, in hours, accrued.

4.3.3 Realignment Costs

Realignments are actions that involve the closure or reduction of the level of activity of an installation. The realignment may, in turn, cause the relocation of individuals from one installation to another. All career employees are given maximum assistance in continuing their careers as employees of the federal government through reassignment to other positions in the DoD or other federal agencies. Employees whose jobs are transferred to other locations are given the opportunity to transfer to the new location and the government will pay the cost of transporting them, their families, and their households. Users requiring the capability to compute the costs of such transfers may benefit from addition of a PCS module, described above.

APPENDIX A: DATA SOURCES

This appendix presents data sources for each variable used in the policy modules.

A.1 BASE SALARY

VARIABLE	DEFINITION	DATA SOURCE
GSbasePay	GS annual salary	<i>Federal Employees' Almanac</i>
WBbasePay	Wage Board wage rate	OPM
inventory	GS and WB employee inventories	DMDC (Master Civilian File)
GSRegPayMult	locality pay multipliers	<i>Federal Employees' Almanac</i>

A.2 RETIREMENT BENEFITS

VARIABLE	DEFINITION	DATA SOURCE
CSRS	% of Fed empls enrolled in CSRS	DMDC
FERS	% of Fed empls enrolled in FERS	DMDC
navyFERS	Navy contribution to FERS system	OMB Actuarial Dept.
navyCSRS	Navy contribution to CSRS system	OMB Actuarial Dept.
opmFERS	OPM contribution to FERS system	OMB Actuarial Dept.
opmCSRS	OPM contribution to CSRS system	OMB Actuarial Dept.

A.3 PREMIUM PAYS

VARIABLE	DEFINITION	DATA SOURCE
gs_prem_rate	GS premium pay rates	<i>Federal Employees' Almanac</i>
wb_prem_rate	WB premium pay rates	<i>Federal Employees' Almanac</i>
gs_prob	Prob. of receiving prem. pay (GS)	User specified
gs_prob	Prob. of receiving prem. pay (GS)	User specified
HrsWk	Ave. hours of premium time worked	User specified

A.4 OTHER BENEFITS

VARIABLE	DEFINITION	DATA SOURCE
averageFEGHI	Average cost of health insurance	AMCOS
aveFEGLIMult	Cost of life ins. (% of base pay)	Navy Comptroller
aveMiscMult	Cost of misc. bens. (% of base pay)	Navy Comptroller

APPENDIX B: GS OCCUPATIONAL CATEGORIES

OCC. #	DESCRIPTION
0000	All Navy
0006	Correctional Institution Administration
0018	Safety & Occupational Health Management
0019	Safety Technician
0020	Community Planning
0021	Community Planning Technician
0025	Park Ranger
0028	Environmental Protection Specialist
0029	Environmental Protection Assistant
0030	Sports Specialist
0050	Funeral Directing
0060	Chaplain
0062	Clothing Design
0072	Fingerprint Identification
0080	Security Administration
0081	Fire Protection & Prevention
0083	Police
0085	Guard
0086	Security Clerical & Assistance
0099	General Science Student Trainee
0101	Social Science
0102	Social Science Aid & Technician
0110	Economist
0131	International Relations
0132	Intelligence
0134	Intelligence Aid & Clerk
0150	Geography
0170	History
0180	Psychology
0181	Psychology Aid & Technician
0185	Social Work
0186	Social Services Aid & Assistant
0187	Social Services
0188	Recreation
0189	Recreation Aid & Assistant
0193	Archeology
0199	Social Science Student Trainee
0201	Personnel Management
0203	Personnel Clerical & Assistance
0204	Military Personnel Clerical & Technician

0205	Military Personnel Management
0212	Personnel Staffing
0221	Position-Classification
0222	Occupational Analysis
0230	Employee Relations
0233	Labor Relations
0235	Employee Development
0246	Contractor Industrial Relations
0260	Equal Employment Opportunity
0299	Personnel Management Student Trainee
0301	Miscellaneous Administration & Program
0302	Messenger
0303	Miscellaneous Clerk & Assistant
0304	Information Receptionist
0305	Mail & File
0309	Correspondence Clerk
0312	Clerk-Stenographer & Reporter
0313	Work Unit Supervising
0318	Secretary
0319	Closed Microphone Reporter
0322	Clerk-Typist
0326	Office Automation, Clerical & Assistance
0332	Computer Operation
0334	Computer Specialist
0335	Computer Clerk & Assistant
0340	Program Management
0341	Administrative Officer
0342	Support Services Administration
0343	Management Analysis
0344	Management Clerical & Assistance
0346	Logistics Management
0350	Equipment Operator
0351	Printing Clerical
0356	Data Transcriber
0357	Coding
0359	Electric Accounting Machine Operation
0361	Equal Opportunity Assistance
0382	Telephone Operating
0390	Communications Relay Operation
0391	Communications Management
0392	General Communications
0393	Communications Specialist
0394	Communications Clerical
0399	Administration and Office Support Student Trainee
0401	General Biological Science
0403	Microbiology
0404	Biological Technician
0408	Ecology
0413	Physiology

0414	Entomology
0415	Toxicology
0430	Botany
0437	Horticulture
0440	Genetics
0457	Soil Conservation
0458	Soil Conservation Technician
0460	Forestry
0462	Forestry Technician
0480	General Fish & Wildlife Administration
0482	Fishery Biology
0486	Wildlife Biology
0493	Home Economics
0499	Biological Science Student Trainee
0501	Financial Administration & Program
0503	Financial Clerical & Assistance
0505	Financial Management
0510	Accounting
0511	Auditing
0525	Accounting Technician
0530	Cash Processing
0540	Voucher Examining
0544	Payroll
0545	Military Pay
0560	Budget Analysis
0561	Budget Clerical & Assistance
0599	Accounting Student Trainee
0601	General Health Science
0602	Medical Officer
0603	Physician Assistant
0610	Nurse
0620	Practical Nurse
0621	Nursing Assistant
0622	Medical Supply Aide & Technician
0625	Autopsy Assistant
0630	Dietitian & Nutritionist
0631	Occupational Therapist
0633	Physical Therapist
0636	Rehabilitation Therapy Assistant
0638	Recreation/Creative Arts Therapist
0640	Health Aid & Technician
0642	Nuclear Medicine Technician
0644	Medical Technologist
0645	Medical Technician
0646	Pathology Technician
0647	Diagnostic Radiologic Technologist
0648	Therapeutic Radiologic Technologist
0649	Medical Machine Technician
0651	Respiratory Therapist

0660	Pharmacist
0661	Pharmacy Technician
0662	Optometrist
0665	Speech Pathology & Audiology
0667	Orthotist & Prosthetist
0669	Medical Record Librarian
0670	Health System Administration
0671	Health System Specialist
0673	Hospital Housekeeping Management
0675	Medical Record Technician
0679	Medical Clerk
0681	Dental Assistant
0682	Dental Hygiene
0683	Dental Laboratory Aid & Technician
0688	Sanitarian
0690	Industrial Hygiene
0698	Environmental Health Technician
0699	Medical & Health Student Trainee
0701	Veterinary Medical Science
0801	General Engineering
0802	Engineering Technician
0803	Safety Engineering
0804	Fire Prevention Engineering
0806	Materials Engineering
0807	Landscape Architecture
0808	Architecture
0809	Construction Control
0810	Civil Engineering
0817	Surveying Technician
0818	Engineering Drafting
0819	Environmental Engineering
0830	Mechanical Engineer
0840	Nuclear Engineering
0850	Electrical Engineering
0854	Computer Engineering
0855	Electronics Engineering
0856	Electronics Technician
0858	Biomedical Engineering
0861	Aerospace Engineering
0871	Naval Architecture
0873	Ship Surveying
0881	Petroleum Engineering
0892	Ceramic Engineering
0893	Chemical Engineering
0894	Welding Engineering
0895	Industrial Engineering Technician
0896	Industrial Engineering
0899	Engineering & Architecture Student Trainee
0904	Law Clerk

0905	General Attorney
0945	Clerk of Court
0950	Paralegal Specialist
0962	Contact Representatives
0986	Legal Clerk & Technician
0987	Tax Law Specialist
0990	General Claims Examining
0992	Loss & Damage Claims Examining
0995	Dependents & Estates Claims Examining
0996	Veterans Claims Examining
0998	Claims Clerical
0999	Legal Occupations Student Trainee
1001	General Arts & Information
1008	Interior Design
1010	Exhibits Specialist
1015	Museum Curator
1016	Museum Specialist & Technician
1020	Illustrating
1021	Office Drafting
1035	Public Affairs
1040	Language Specialist
1046	Language Clerical
1051	Music Specialist
1060	Photography
1071	Audio-Visual Production
1082	Writing & Editing
1083	Technical Writing & Editing
1084	Visual Information
1087	Editorial Assistance
1099	Information and Arts Student Trainee
1101	General Business & Industry
1102	Contracting
1103	Industrial Property Management
1104	Property Disposal
1105	Purchasing
1106	Procurement Clerical & Assistance
1107	Property Disposal Clerical & Technician
1130	Public Utilities Specialist
1150	Industrial Specialist
1152	Production Control
1160	Financial Analysis
1163	Insurance Examining
1170	Realty
1171	Appraising & Assessing
1173	Housing Management
1176	Building Management
1199	Business and Industry Student Trainee
1221	Patent Adviser
1222	Patent Attorney

1301	General Physical Science
1306	Health Physics
1310	Physics
1311	Physical Science Technician
1313	Geophysics
1315	Hydrology
1320	Chemistry
1321	Metallurgy
1330	Astronomy & Space Science
1340	Meteorology
1341	Meteorological Technician
1350	Geology
1360	Oceanography
1361	Navigational Information
1370	Cartography
1371	Cartographic Technician
1372	Geodesy
1373	Land Surveying
1374	Geodetic Technician
1384	Textile Technology
1386	Photographic Technology
1397	Document Analysis
1399	Physical Science Student Trainee
1410	Librarian
1411	Library Technician
1412	Technical Information Services
1420	Archivist
1421	Archives Technician
1499	Library and Archives Student Trainee
1515	Operations Research
1520	Mathematics
1521	Mathematics Technician
1529	Mathematical Statistician
1530	Statistician
1531	Statistical Assistant
1550	Computer Science
1599	Mathematical Science Student Trainee
1601	General Facilities & Equipment
1640	Facility Management
1654	Printing Management
1658	Laundry & Dry Cleaning Plant Management
1667	Steward
1670	Equipment Specialist
1701	General Education & Training
1702	Education & Training Technician
1710	Education & Vocational Training
1712	Training Instruction
1720	Education Program
1725	Public Health Educator

1730	Education Research
1740	Education Services
1750	Instructional Systems
1799	Education Student Trainee
1801	General Inspection, Investigation, & Compliance
1802	Compliance Inspection & Support
1810	General Investigating
1811	Criminal Investigating
1815	Air Safety Investigating
1890	Customs Inspection
1910	Quality Assurance
1999	Quality Inspection Student Trainee
2001	General Supply
2003	Supply Program Management
2005	Supply Clerical & Technician
2010	Inventory Management
2030	Distribution Facilities & Storage Management
2032	Packaging
2050	Supply Cataloging
2091	Sales Store Clerical
2099	Supply Student Trainee
2101	Transportation Specialist
2102	Transportation Clerk & Assistant
2130	Traffic Management
2131	Freight Rate
2132	Travel
2134	Shipment Clerical and Assistance
2135	Transportation Loss & Damage Claims Examining
2144	Cargo Scheduling
2150	Transportation Operations
2151	Dispatching
2152	Air Traffic Control
2154	Air Traffic Assistance
2161	Marine Cargo
2181	Aircraft Operation
2185	Aircrew Technician
2199	Transportation Student Trainee

APPENDIX C: GEOGRAPHIC DESIGNATIONS

C.1 FEDERAL WAGE SYSTEM SCHEDULES

Area ID	Description	Area ID	Description
1	Anniston-Gadsten	44	Hawaii
2	Birmingham	45	Boise
3	Dothan	46	Champaign-Urbana
4	Huntsville	47	Chicago
7	Alaska	48	Bloomington-Bedford-Washington
8	Northeastern Arizona	49	Ft. Wayne-Marion
9	Phoenix	50	Indianapolis
10	Tucson	52	Cedar Rapids-Iowa City
11	Little Rock	53	Davenport-Rock Island-Moline
12	Fresno	54	Des Moines
13	Los Angeles	55	Dubuque
14	Sacramento	56	Topeka
15	Salinas-Monterey	57	Wichita
16	San Bernadino-Riverside-Ontario	58	Lexington
17	San Diego	59	Louisville
18	San Francisco	60	Lake Charles-Alexandria
19	Santa Barbara	61	New Orleans
20	Stockton	62	Shreveport
22	Denver	63	Augusta
23	Northern and Western Colorado	64	Central and Northern Maine
24	New Haven	65	Portland Maine
25	New London	66	Baltimore
26	Wilmington	67	Hagerstown-Martinsburg-Chambersburg
27	Washington D.C.	68	Boston
28	Cocoa Beach-Melbourne	69	Central and Western Massachusetts
30	Jacksonville	70	Detroit
31	Miami	71	Northwestern Michigan
32	Orlando	72	Oscoda-Alpena
33	Panama City	73	Southwestern Michigan
34	Pensacola	74	Duluth
35	Tampa-St. Petersburg	75	Minneapolis-St. Paul
36	Albany	76	Biloxi
37	Atlanta	77	Columbus-Aberdeen
38	Augusta Georgia	78	Jackson
40	Columbus Georgia	79	Meridian
41	Macon	80	Kansas City
42	Savannah	81	St. Louis

Area ID	Description	Area ID	Description
82	Southern Missouri	125	Nashville
83	Great Falls	127	Western Texas
84	Omaha	129	Austin
85	Las Vegas	130	Corpus Christi
86	Reno	131	Dallas-Fort Worth
87	Portsmouth	132	El Paso
89	Albuquerque	133	Houston-Galveston-Texas City
91	Albany-Schenectady-Troy	135	San Antonio
92	Buffalo	136	Texarkana
93	Newburgh	137	Waco
94	New York	138	Wichita Falls-SW Oklahoma
95	Northern New York	139	Utah
96	Rochester	140	Norfolk-Portsmouth-Newport News-Hampton
97	Syracuse-Utica-Rome	141	Richmond
98	Asheville	142	Roanoke
99	Central North Carolina	143	Seattle-Everett-Tacoma
100	Charlotte	144	SE Washington-Eastern Oregon
101	Southeastern North Carolina	145	Spokane
103	North Dakota	146	West Virginia
104	Cincinnati	147	Madison
105	Cleveland	148	Milwaukee
106	Columbus, Ohio	149	Southwestern Wisconsin
107	Dayton	150	Wyoming
109	Oklahoma City	151	Puerto Rico
111	Tulsa		
112	Portland Oregon		
113	Southwestern Oregon		
114	Harrisburg		
115	Philadelphia		
116	Pittsburgh		
117	Scranton-Wilkes Barre		
118	Narragansett Bay		
119	Charleston		
120	Columbia		
121	Eastern South Dakota		
123	Eastern Tennessee		
124	Memphis		

C.2 METROPOLITAN STATISTICAL AREAS (FOR GS LOCALITY PAY)

1.	Atlanta
2.	Boston
3.	Chicago
4.	Cincinnati
5.	Cleveland
6.	Columbus, OH
7.	Dallas
8.	Dayton
9.	Denver
10.	Detroit
11.	Houston
12.	Huntsville
13.	Indianapolis
14.	Kansas City
15.	Los Angeles
16.	Miami
17.	Milwaukee
18.	Minneapolis
19.	New York
20.	Philadelphia
21.	Pittsburgh
22.	Portland, OR
23.	Richmond, VA
24.	Sacramento
25.	St. Louis
25.	San Diego
26.	San Francisco
27.	Seattle
28.	Washington, DC
29.	Rest of U.S.