

# The 2021 Value of the U.S. Coast Guard Auxiliary



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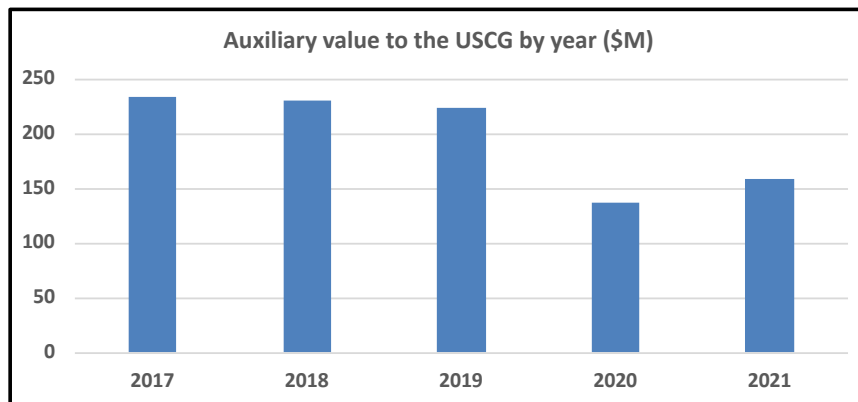
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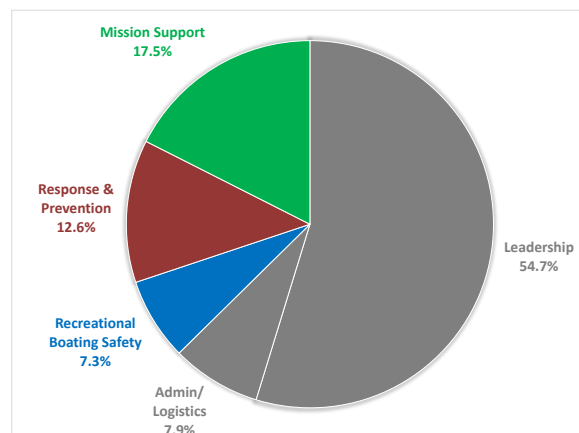
## EXECUTIVE SUMMARY

This is the eighth in a series of annual reports that quantify the monetary value of the contributions of the Auxiliary to the work of the U.S. Coast Guard. Begun in 2014, these reports employ a methodology that is compliant with Generally Accepted Accounting Procedures (GAAP) and Federal Accounting Standard (FAS) 116 concerning the value of volunteer labor. This report follows the same analytical processes that have been used since 2017, with the exception that the 2020 and 2021 reports are based on AUXDATA II, whereas earlier reports were based on AUXINFO derived from AUXDATA I.

The total financial contributions of the Auxiliary to the Coast Guard over the past five years is shown in the following chart. Noteworthy is the very significant impact of COVID-19 in 2020, and the slow, but measurable, recovery in 2021.



The distribution of value across the principal mission areas of the Auxiliary have remained largely unchanged over time and, for 2021, are expressed in the pie chart below.



The analysis documented in this report demonstrates that, since the Coast Guard budgeted \$18.15M for the Auxiliary in 2021 and received \$159.05M in service value in return, the Auxiliary returned \$8.76 for each dollar invested.

## **SECTION 1: Introduction**

### **Purpose**

This is the eighth in a series of annual reports that quantify the monetary value of the contributions of the Auxiliary to the work of the U.S. Coast Guard. Begun in 2014, these reports employ a methodology that is compliant with Generally Accepted Accounting Procedures (GAAP) and Federal Accounting Standard (FAS) 116 concerning the value of volunteer labor.

This report provides an accurate and standardized economic valuation of the Coast Guard Auxiliary which enables consistency in reporting, both internal and external to the USCG, that decision makers require. For the Auxiliary itself, a fair valuation enables membership and leadership to assess and validate the value of their contributions to the Coast Guard and to the country.

### **General methodology**

This valuation principally relies upon a replacement cost methodology as described in Appendix A to this report. It is expressed in terms of full-time equivalent (FTE) USCG active-duty personnel, and is computed in terms of the equivalent annual cost of replacing those FTE volunteer labor contributions made by the Auxiliary.

It must be noted that there are significant and persistent source data limitations. Every financial valuation must contend with this problem, but some of the data limitations in this valuation stem from systemic limitations in the Auxiliary data system (AUXDATA). The largest and most well-known among these is the fact that Auxiliary data is self-reported. By no means unique to the Auxiliary, the most likely effect that this limitation has, overall, is to undervalue the Auxiliary contribution.

Additionally, this report separately includes a valuation of Auxiliary contributions, other than labor, that represent a direct monetary benefit to the Coast Guard. These include:

- Cost of Auxiliary air facility maintenance, less SAMA payments
- Cost of Auxiliary surface facility maintenance, less SAMA payments
- Auxiliarist out-of-pocket expenses
- Auxiliarist unreimbursed automotive travel

## SECTION 2: Analysis Methodology and 2021 Results

### Auxiliary mission areas and their aggregation

AUXDATA II is used as the sole data source for the labor hours in this valuation. Unlike AUXINFO, which was derived from AUXDATA I, the report function in AUXDATA II generates results by individual mission code. As a consequence, the labor hours associated with each of the 105 unique mission codes is aggregated into the 25 mission categories, shown in Table 1.

Throughout this report, a color code is used to identify the three principal mission areas of the Auxiliary, each being the responsibility of a Deputy National Commodore (DNACO): **Recreational Boating Safety (RBS)**, **Operations (R&P)**, and **Mission Support (MS)**. The two “overhead” functions, Leadership (99A) and Administration/Logistics (99E), are tabulated separately and shown in grey.

Mission Category	Raw Labor Hours
ATON - Aids to Navigation (30, 31,32)	2,717
AUXMP - Maritime Patrol (01, 02,03,,54A,55A)	119,759
CGADMIN - CG Administrative Support (08, 92)	44,470
CGOPS - CG Operational Support (07, 20, 22, 26)	148,321
GOVSUP - Government Agency Support (41, 42, 43)	3,595
HS - Health Services (93)	6,684
IA - International Affairs (60)	2,160
ICE - Ice Operations (53)	212
LEGAL - Legal Services (94)	1,658
LO - Legislative Outreach (65)	1,211
MEP - Marine Environmental Protection (28)	7,248
MS - Marine Safety (70, 80)	45,241
MT -Member Training (06)	31,966
No Mission Listed	0
RBS - Leadership (99A)	1,068,533
RBS - RBS Support (99B)	108,750
RBS - Marine Safety (99C)	13,297
RBS - Training Support (99D)	301,019
RBS - Admin/Logistics (99E)	218,665
SAR - Search & Rescue(23, 24)	2,197
UMDV -Marine Dealer Visits (11)	26,147
UPA - Public Affairs (10)	66,301
UPE - Public Education (14)	27,233
UREC - Recruiting Assistance (09, 90)	14,951
VSC - Vessel Safety Check (91)	39,727
<b>TOTAL</b>	<b>2,302,061</b>

**Table 1: 2021 Auxiliary mission hours by mission categories**

The dominant data element is mission code 99 which, as noted in prior years, is broken into its five component parts, with each part considered independently as to its proper allocation. This provides a means to distinguish that portion of 99 labor that provides direct support to the USCG in the pursuit of its Homeland Security charter, as opposed to that which is in support of internal Auxiliary activities. Prior to the 2017 Valuation Report, all 99 hours had been tabulated in Recreational Boating Safety but have since been broken out as described.

**Converting mission hours into labor costs**

The distribution of raw hours into the various components of Auxiliary activity at a fixed labor rate would not be GAAP-compliant because it would be independent of the skill levels (and the associated notional compensation) that would be required for each task. As noted in the Introduction, and supported in Appendix A of this report, a mapping to active duty skill levels is required.

Standard personnel costs

In order to establish a financial metric for Auxiliary contribution to be used to contrast with the USCG financial investment in the Auxiliary, a set of Standard Personnel Costs is needed. This report uses COMDTINST 7310.1U, Reimbursable Standard Rates, dated 27 February 2020, which was in force for the majority of calendar year 2021 (as well as in 2020). Updated periodically by CG-83, this source contains, among other things, hourly standard rates for vessels, aircraft and personnel and thus ensures that the very latest approved calculations of manpower costs are utilized. These hourly rates for personnel services (officer, enlisted and civilian) are based upon prevailing annual standard personnel costs as reflected in COMDTINST M5310.6(series), Coast Guard Manpower Requirements Manual. Auxiliary labor is considered “internal to the government” for the purposes of this analysis and thus excludes unfunded retirement and medical costs charged for customer effort that is external to the government.

The hourly rates for those pay grades deemed to be applicable to Auxiliary work (other than code 99A) is shown below:

Officer equivalents		Enlisted equivalents	
CDR	\$111	PO1	\$62
LCDR	\$98	PO2	\$54
LT	\$84	PO3	\$45
LTJG	\$70	SN	\$36
ENS	\$54		

Assignment of skill levels and costs for operations (all codes except 99)

For all operational activities, as reported on Form 7030, hours are allocated in AUXDATA II to LEAD, NON-LEAD, and TRAINEE. These provide great flexibility in assigning active duty equivalencies.

Each operational mission category, listed in Table 1 can be assigned a rank/rate equivalency corresponding to the level of complexity of the work, including LEAD/NON-LEAD/TRAINEE distinctions.

A special case exists when there is a platform dependency as well. Participants in a surface Maritime Patrol mission are assigned Boatswains Mate equivalents, while those in an air Maritime Patrol mission are assigned commissioned officer equivalents. Thus, they must be broken out, considered separately, then aggregated. This only pertains to three mission categories: Maritime Patrol, Search and Rescue, and Government Support.

#### Assignment of skill levels and costs for mission code 99

It is not practical to retrieve individual 7029 hours from each and every member and sum them by office category. As a proxy, however, it is possible to calculate a weighted average cost for all elected and appointed officers to use in the valuation of 99a (Leadership) hours. Similarly, it is possible to calculate a weighted average cost for all members (officers included) to use in the valuation of the remainder of the 99 hours (99b through 99e).

Developing a weighted average implies the development of an arbitrary weighting factor. One cannot assign equal weight to the single RADM-equivalent National Commodore who may perform highly sophisticated work for 2,000 or more hours a year to the many thousands of Flotilla Staff Officers who may do less demanding work only 100 hours a year. If a weighting process were not applied, the 9,000+ members without elected or appointed office and the almost 7,000 FSOs would swamp out the higher grades, causing the value of the NACO's time to be assigned a value similar to that of an Ensign.

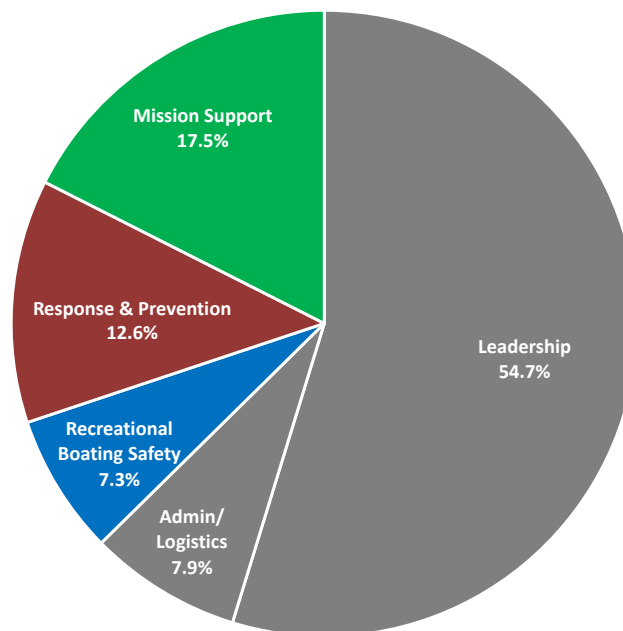
The mathematical details of the analysis associated with the weighting process are omitted here for brevity, but are contained in Appendix B. The result (calculated for 2020 and deemed to be unchanged in 2021) is that the average weighted cost for time spent by an elected or appointed officer (Code 99A) is \$79.93/hour. The comparable cost for time not associated with leadership (Codes 99b-e) is \$56.27/hour.

#### Summary of labor costs

From the AUXDATA II extract, an expanded spreadsheet has been created to reflect all of the LEAD/NON-LEAD/TRAINEE distinctions and the rank/rate equivalents (and the associated cost) to generate the overall labor cost, by principal mission area. This spreadsheet is available upon request from the authors, and its bottom-line data are represented in the table and the pie chart that follow.

	Labor Value	Leadership	Admin/Log	RBS	R&P	Msn. Support
ATON - Aids to Navigation (30, 31,32)	\$143,319				\$143,319	
AUXMP - Maritime Patrol (01, 02,03,,54A,55A)	\$6,241,961				\$6,241,961	
CGADMIN - CG Administrative Support (08, 92)	\$2,754,927					\$2,754,927
CGOPS - CG Operational Support (07, 20, 22, 26)	\$8,703,925				\$8,703,925	
GOVSUP - Government Agency Support (41, 42, 43)	\$182,334				\$182,334	
HS - Health Services (93)	\$677,988					\$677,988
IA - International Affairs (60)	\$207,666				\$207,666	
ICE - Ice Operations (53)	\$19,020				\$19,020	
LEGAL - Legal Services (94)	\$183,296					\$183,296
LO - Legislative Outreach (65)	\$101,724			\$101,724		
MEP - Marine Environmental Protection (28)	\$445,250				\$445,250	
MS - Marine Safety (70, 80)	\$2,783,319				\$2,783,319	
MT -Member Training (06)	\$1,825,541					\$1,825,541
No Mission Listed	\$0					
RBS - Leadership (99A)	\$85,407,880	\$85,407,880				
RBS - RBS Support (99B)	\$6,119,337			\$6,119,337		
RBS - Marine Safety (99C)	\$748,202				\$748,202	
RBS - Training Support (99D)	\$16,938,312					\$16,938,312
RBS - Admin/Logistics (99E)	\$12,304,258		\$12,304,258			
SAR - Search & Rescue(23, 24)	\$144,547				\$144,547	
UMDV -Marine Dealer Visits (11)	\$1,165,900			\$1,165,900		
UPA - Public Affairs (10)	\$4,077,207					\$4,077,207
UPE - Public Education (14)	\$1,549,550			\$1,549,550		
UREC - Recruiting Assistance (09, 90)	\$924,542					\$924,542
VSC - Vessel Safety Check (91)	\$2,377,158			\$2,377,158		
<b>TOTAL</b>	<b>\$156,027,162</b>	<b>\$85,407,880</b>	<b>\$12,304,258</b>	<b>\$11,313,670</b>	<b>\$19,619,542</b>	<b>\$27,381,813</b>
<b>PERCENTAGE</b>	<b>100.0%</b>	<b>54.7%</b>	<b>7.9%</b>	<b>7.3%</b>	<b>12.6%</b>	<b>17.5%</b>

**Table 2: Distribution of labor costs across principal mission areas in 2021**



**Figure 1: Distribution of labor costs across principal mission areas in 2021**



## Facility maintenance costs

Facility maintenance costs can be established by gathering, from reputable sources, a true cost of maintenance for each Standard Auxiliary Maintenance Allowance (SAMA) type, both air and surface. Subtracting the SAMA reimbursement from the true cost of maintenance, then summing across SAMA types, will yield a result that is actually the total out-of-pocket cash contributions from Auxiliary facility owners to the Coast Guard.

For aviation facilities, there is a reputable data source for maintenance cost, the Conklin & de Decker *Aircraft Cost Evaluator*. It is available only by paid subscription, but a limited extract was made available at no cost in 2019. The 2019 numbers are used, inflated by 5% per year. The resultant numbers are very much in line with both the aircraft reimbursement rates published by the Under Secretary of Defense (Comptroller) and the current Civil Air Patrol reimbursement rates for externally-funded missions.

A weighted average true hourly cost of maintenance was calculated by using the current airframe population (104 facilities) in SAMA classes 1 through 8 as the weighting factor. The true weighted hourly cost for 2019 is \$141.45, which inflates to \$155.95 for 2021. The weighted average SAMA reimbursement, using the same airframe population, is \$51.26. Thus, SAMA reimburses 36.2% of the true cost, which represents a \$104.69 out-of-pocket cost per flight hour to the Auxiliarist.

For surface facilities, no such reputable data base exists. However, a weighted average SAMA reimbursement can be calculated as before by using the current boat population in SAMA types A through I (881 facilities) and the current surface SAMA reimbursements. Doing so yields a weighted average hourly SAMA of \$6.33. If the 36.2% aircraft factor is true for surface assets as well (an unproven, but not unreasonable, assumption), then the average true hourly cost of maintaining a surface facility is \$17.49, which represents a \$11.16 out-of-pocket cost per underway hour to the Auxiliarist.

Applying these numbers, the result for 2021 is:

- 4,615 airborne hours @ \$104.69/hour = \$483,144
- 31,996 underway hours @ 11.16/hour = \$357,075.

## Direct expenses and miles driven

Auxiliarist submissions to AUXDATA II contain the out-of-pocket expenses that an Auxiliarist incurs, as well as the number of miles in personal vehicles driven on Auxiliary business. The latter number is multiplied by the government reimbursement rate for CY2021 as shown in Internal Revenue Service Notice 2020-279. These 2021 expenses are direct contributions to the USCG and should be accounted for since, had they been incurred by the active duty, they would have, in general, been reimbursed:

- Auxiliarist out-of-pocket expenses = \$698,160
- Auxiliarist travel 2,653,160 miles @ \$0.56/mile = \$1,485,770.

## Summary of results

Based upon the data elements previously noted, the contribution of the Auxiliary to the U.S. Coast Guard is:

Equivalent labor	\$156,027,162
Air facility maintenance	\$ 483,144
Surface facility maintenance	\$ 357,075
Auxiliarist out-of-pocket	\$ 698,160
Auxiliarist auto mileage	<u>\$ 1,485,770</u>
TOTAL	\$ 159,051,311

Since CG-BSX-1 reports that the USCG budgeted \$18,150,000 to fund the Auxiliary in FY21, then the USCG received, in return, \$8.76 for every \$1 expended. While less than pre-COVID, this is 10% higher than in COVID year 2020. [Note: the USCG budget allocation is considered “management sensitive” by CG-BSX-1 and is not intended for further distribution.]

## SECTION 3: Trend analysis

### Short term trends: the impact of COVID-19 and the Financial Systems Modernization Solution

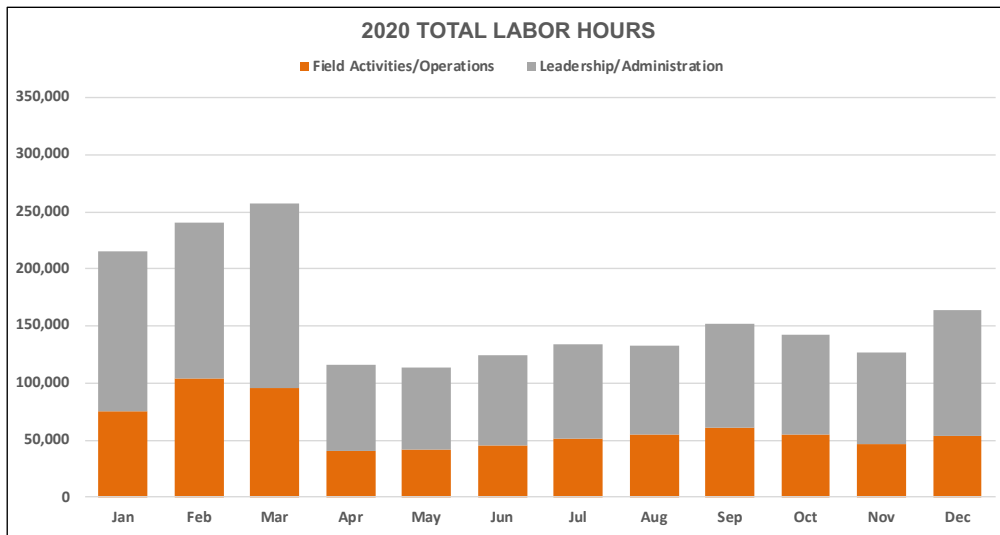
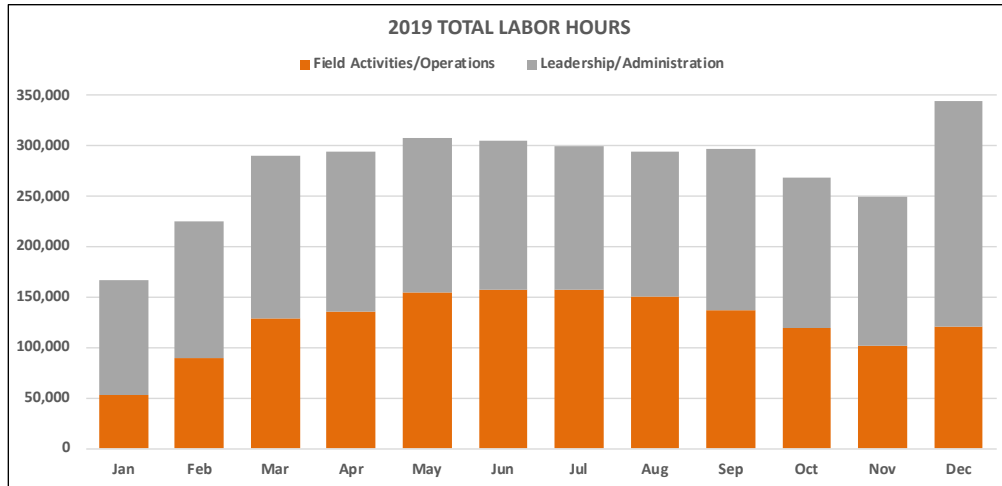
To properly frame this 2021 Valuation Study, it is instructive to begin by comparing – on a month-by-month basis and using 2019 as a “normal” baseline – the labor contributions of the Auxiliary in 2020 and 2021. The three charts that follow on the next page clearly show that the diminution of Auxiliary hours due to COVID-19 began in April 2020 and continued, with but modest gains, through 2021. The reduction in operational hours due to the FSMS transition is small, but evident, beginning in October 2021.

For the purposes of this part of the analysis, all recorded hours were aggregated into two categories: Leadership/Administration, as reflected in mission codes 99a and 99e, and Field Activities/Operations, as reflected in all other mission codes combined. This monthly taxonomy is similar to what was done in 2020, and what had been done on an annual basis prior to that. To facilitate comparison, the abscissae and ordinates are scaled identically.

To review the history, in March 2020, the provisions of ALAUX 003/20 precluded Auxiliarists from participation in missions with any risk of exposure to the COVID-19 virus, with exceptions allowable only by the Order Issuing Authority (OIA) or a District’s Director of Auxiliary (DIRAUX). The impact of this policy on Auxiliary contributions to the Coast Guard was extensively documented in the 2020 version of this Valuation report. While there was hope that the restrictions would be lifted in 2021, the virus proved to be tenacious, with Delta and Omicron variants emerging in the Spring and the Fall, respectively, of 2021. As a consequence, the recovery to a level of normalcy that had heretofore been a hallmark of Auxiliary participation was, instead, slow and erratic. ALAUX 002/21 (February) provided broad reconstitution guidance and ALAUX 021/21 (June) addressed resumption of in-person C-schools.

An additional impediment to 2021 Auxiliary activity came in the form of the transition to the Coast Guard’s Financial Systems Modernization Solution (FSMS), beginning on 1 October 2021. During the planned 6-week transition period, ALAUX 029/21 prohibited air and surface patrols unless the OIA determined them to be mission essential and the facility owner accepted a delay in reimbursement. Unexpected technical issues delayed the completion of the FSMS transition period, resulting in the patrol restrictions being in place through the end of 2021 (and into 2022). This is reflected in the data that follow. The diminution is perhaps not as significant as might be expected because only reimbursable operations (i.e., air and surface patrols) were affected; other operational activity continued as before.

To summarize, the charts demonstrate that the Auxiliary is slowly but steadily recovering from the devastating impact of COVID-19 on its programs that began in April 2020. However, there is a long way to go to regain the “normalcy” represented by 2019.



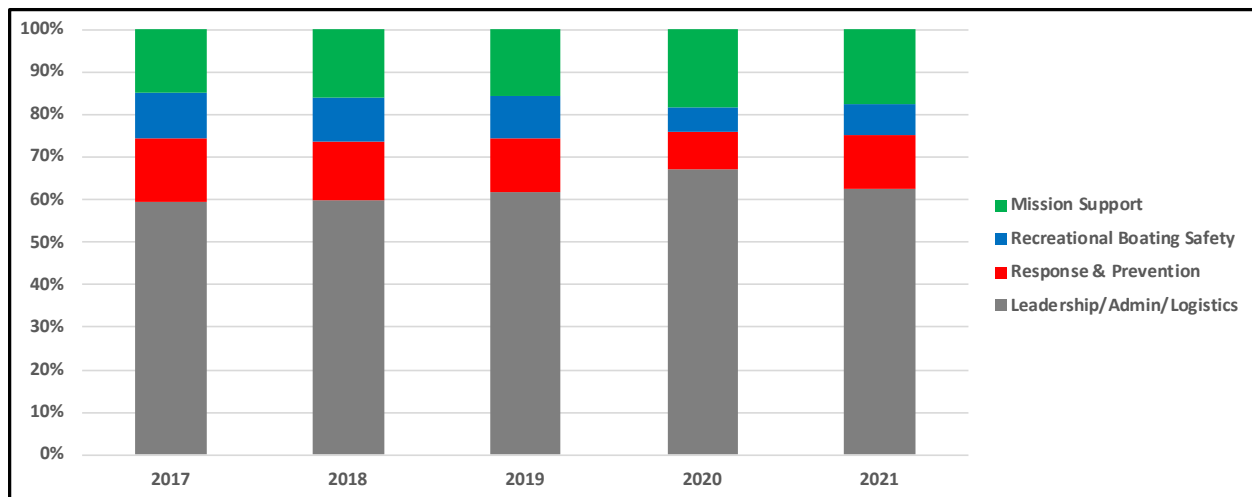
**Figure 2: Monthly labor hours in 2019, 2020, and 2021**

### Longer-term trends from a Mission Area perspective

There now exists five years of data, all collected with an identical methodology, concerning the distribution of Auxiliary activity among the three Principal Mission Areas plus “overhead” functions. The data is presented in both a tabular form and a stacked-bar chart below. There is not a great deal of difference year-to-year but, in general, Leadership/Admin/Logistics (99a&e) and Mission Support (MS) are growing, while Response & Prevention (R&P) and Recreational Boating Safety (RBS) are contracting.

	<b>99a + 99e</b>	<b>R&amp;P</b>	<b>RBS</b>	<b>MS</b>
<b>2017</b>	59.6%	14.7%	10.8%	14.9%
<b>2018</b>	59.7%	13.8%	10.7%	15.8%
<b>2019</b>	61.9%	12.4%	10.0%	15.6%
<b>2020</b>	67.0%	8.9%	5.9%	18.2%
<b>2021</b>	62.6%	12.6%	7.3%	17.5%

**Table 3: Labor distribution among Principal Mission Areas**



**Figure 3: Labor distribution among Principal Mission Areas**

# Appendix A: Background and Analytic Framework

## History

There have been at least two early attempts at Auxiliary valuation; these have been helpful in realizing that there is measurable value in Auxiliary volunteer labor and that the USCG's Return on Investment is likely to be sizable.

A 2010 paper<sup>1</sup>, written by the then-DIRAUX of District 11-North, was the first valuation of the Auxiliary. This work relied on a fixed value of a volunteer labor hour provided by the "Independent Sector," a leadership forum of charities, foundations and corporate giving programs, to derive a valuation estimate. The agreed-upon number in 2009 was \$20.25 per hour, or \$42,120 per annum. In addition, this work evaluated "maritime property saved," a metric that does not accrue directly to the USCG but, nonetheless, represents a real contribution to the civic life of the country.

A 2012 Master's degree thesis<sup>2</sup> for the Naval Postgraduate School, written by an officer then in CG-BSX-1, contributed to the valuation effort by emphasizing a quantification of the value of labor vis a vis the investment of administration to support that labor. His analysis also used a fixed common labor rate for volunteers that was equal to a civilian GS-9, Step 1: \$19.92 per hour, or \$41,434 per annum.

Unfortunately, these previous studies, valuable as they may have been, did not meet the methodological or reporting requirements of GAAP as found in Federal Accounting Standard (FAS) 116, nor did they provide the uniformity and comparability of the Full Time Equivalent (FTE) metric most useful to USCG decision makers, i.e., a direct mapping of volunteer labor skills and value to comparable active duty skills and compensation.

In 2014, Dr. Matthew Carter, a Division Chief in the Performance Measurement Directorate, conducted a scholarly analysis of the measurement of volunteer labor that appeared in each of his Auxiliary valuation reports in 2014, 2015 and 2016. His basic framework allows for the resultant analytical product to be considered GAAP-compliant, and a distillation of his theoretical framework is provided in the section that follows immediately. The 2017 report, and all subsequent reports, continue to be GAAP-compliant as before, but now in the context of a documented and repeatable audit trail, using available and approved current data.

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<sup>1</sup> Chareonsuphiphat, D. (2010). Return on Investment, The Value of the U.S. Coast Guard Auxiliary. Proceedings of the Marine Safety & Security Council, 73-75.

<sup>2</sup> Barner, M. (2012). The Future Mission Tasking and Resourcing of the U.S. Coast Guard Auxiliary. Monterey, CA: Naval Postgraduate School.

## Measurement of volunteer labor

Other organizations that rely on and measure the value of volunteer labor employ one of three measurement methods: the social benefit approach<sup>3</sup>, the opportunity cost approach<sup>4</sup>, or the replacement cost approach<sup>5</sup>. The social benefit approach measures the output value of volunteer labor, while the opportunity cost and replacement cost approaches measure the input value of volunteer labor<sup>6</sup>.

Each approach can use either observed or declared market proxies for their variables. The opportunity cost approach can rely on an observed alternative-employment wage rate or an expert-declared volunteer wage rate. The replacement cost approach can use either an observed replacement wage or declared wage amount based on management judgment. The social benefit approach can either use the observed fair market value of equivalent goods and services or the declared judgment of the beneficiary of the goods and services<sup>7</sup>.

All of these approaches rely on five primary variables to report on volunteer labor: the number of volunteers and volunteer labor hours, the skill and occupational nature of the work performed, and the industry and institutional setting in which that volunteer labor is donated. The management information system of organizations measuring the value of their volunteer labor should capture and provide these key variables to fully use one of these three measurement strategies.

GAAP requires that volunteer labor be measured at fair market value (FAS 16). The two input-based measurement approaches make conforming to GAAP standards considerably easier than the output-based social benefit approach. The replacement cost approach is “the consensus [choice] among researchers in the field” as the “most reasonable method for estimating the economic value of volunteer inputs”<sup>8</sup>.

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<sup>3</sup> Begona, A.-F., Hanley, N., and Barberan, R. (2001). The Value of Leisure Time: A Contingent Rating Approach. *Journal of Environmental Planning and Management*, 44(5), 681-699.

<sup>4</sup> Brown, E. (1999). Assessing the Value of Volunteer Activity. *Nonprofit and Voluntary Sector Quarterly*, 28(3), 3-17.

<sup>5</sup> Mook, L., Handy, F., Ginieniewicz, J., and Quarter, J. (2007). The Value of Volunteering for a Nonprofit Membership Association: The Case of ARNOVA. *Nonprofit and Voluntary Sector Quarterly*, 36(3), 504-520.

<sup>6</sup> International Labour Office. (2011). *Manual on the Measurement of Volunteer Work*. Geneva: International Labour Office.

<sup>7</sup> Salamon, L., Sokolowski, S., and Haddock, M. (2011). Measuring the Economic Value of Volunteer Work Globally: Concepts, Estimates, and a Roadmap to the Future. *Annals of Public and Cooperative Economics*, 82(3), 217-252.

<sup>8</sup> International Labour Office. (2011). *Manual on the Measurement of Volunteer Work*. Geneva: International Labour Office, page 36

Given that Auxiliary information systems do capture these variables and that USCG active duty observable equivalents exist for Auxiliary volunteer labor, this valuation will rely on observable input-based variables. Further, given the USCG's internal reporting goals of consistent and reliable side by side comparability, the replacement cost method of measurement was used in the valuation.

The replacement cost method establishes the true value of volunteer labor as the fair market value of equivalent paid labor<sup>9</sup>. "To begin the economic assessment of volunteer labor, the market value of a nonpaid position is set at the annual salary for the beginning level of the equivalent job classification grade. If volunteers fill several agency jobs, a parallel paid position must be established for each one"<sup>10</sup>.

Notwithstanding its status as the industry-standard and GAAP-approved<sup>11</sup> method for measuring the value of volunteer labor, the replacement cost approach is criticized for two potential weaknesses: the "hypothesized differences in skill and efficiency between a volunteer and a paid employee essentially doing the same job" and "the differences in wage rates for similar work in different institutional settings (nonprofit organizations, government and for-profit businesses.)"<sup>12</sup>

Because the Auxiliary shares the same institutional setting as the rest of the USCG, the second potential weakness does not exist. To accommodate the first potential weakness, this valuation will take the specialist replacement approach within the replacement cost measurement method, which asserts that paid labor can perfectly substitute for the volunteer labor being measured. The specialist approach is "very precise and likely to result in the most accurate estimate" of replacement costs, although it requires a considerable amount of effort to map volunteer tasks to equivalent paid labor tasks<sup>13</sup>. The office of the Chief Director (CG-BSX-1) provided guidance in determining these equivalencies.

In 1978, the Financial Accounting Standards Board (FASB) established four criteria that must be present for the value of volunteer labor to be included in financial statements and reporting:

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<sup>9</sup> Karn, G. (1982). Money Talks: A guide to establishing the true dollar value of volunteer time (Part I). *Voluntary Action*, 1(2), 1-17.

<sup>10</sup> Brudney, J. (1990). *Fostering Volunteer Programs in the Public Sector: Planning, Initiating, and Managing Voluntary Activities*. San Francisco: Jossey-Bass.

<sup>11</sup> Mook, L., Richmond, B., and Quarter, J. (2001). Calculating the value of volunteer contributions for financial statements. *The Philanthropist*, 18(1), 71-83.

<sup>12</sup> International Labour Office. (2011). *Manual on the Measurement of Volunteer Work*. Geneva: International Labour Office. p.36

<sup>13</sup> Mook, L., and Quarter, J. (2003). *How to Assign a Monetary Value to Volunteer Contributions*. Toronto: The Canadian Centre for Philanthropy.



1. The value must be measurable
2. The organization must manage its volunteers similarly to its employees
3. The volunteer labor services must be part of the organization's normal work that would otherwise need to be purchased
4. The volunteer labor services must be for public benefit rather than the benefit of the organization's own members.

In 1993, FAS 116 was issued by FASB to regulate the value of contributed services like volunteer labor as reported on statements "for internal and external purposes, grant proposals, and annual reports" (FAS 116). FAS 116 allows the recognition of the value of volunteer labor in financial reporting if either:

1. The service provided by a volunteer either creates or enhances a nonfinancial asset like equipment or buildings
2. The service requires specialized skills, is provided by individuals with those skills, and would otherwise need to be purchased<sup>14</sup>.

The value of the volunteer labor for GAAP is its observed fair market value, either as purchased or as a wage. Auxiliary volunteer labor clearly satisfies all of these criteria and is therefore eligible to be valued and presented within USCG financial reporting.

### **The concept of "equivalency"**

The preceding section establishes that, in order to be GAAP-compliant and FAS 116-compliant, the valuation of a volunteer's time has to be treated in the same manner as an active duty member's time. This necessitates that each level of Auxiliary qualification, or elected or appointed office, must be assigned a corresponding rank (officer equivalents) or rate (enlisted equivalents), with the process also including members having neither qualification nor office.

A table of equivalencies was originally approved by CG-BSX-1 in 2014 and, in 2017, expanded to be fully comprehensive. The term "equivalency," as used in this report, indicates only that the Auxiliarist possesses skills or responsibilities comparable to those typically held by a member of the Coast Guard holding the corresponding rank or rate. For this reason, in the consideration of equivalencies in elected or appointed office, there is not a one-to-one correspondence between the Auxiliarists insignia of office and the rank/rate insignia of the assigned equivalent. Furthermore, it does not in any way suggest that the Auxiliarist should be considered as holding that equivalent pay grade. To do so would be inconsistent with 33 CFR §5.14(a) "Auxiliary uniform insignia do not indicate rank in any military service or government agency."

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<sup>14</sup> Zietlow, J., Hankin, J., and Seidner, A. (2007). *Financial Management for Nonprofit Organizations*. Hoboken: John Wiley & Sons.

## APPENDIX B: Valuation of 99 hours

The process of developing a weighted average is complicated and, thus, relegated to this Appendix to avoid undue complexity in the body of this report. This Appendix is intended only to be illustrative, and the actual data are from 2020.

The fundamental problem is that the distribution of 99 hours among Auxiliary elected and appointed officers and other members cannot be measured accurately and, in some cases, a member holds multiple roles simultaneously. With perfect knowledge, the hours could simply be multiplied by the hourly cost and summed. In the absence of that knowledge, another technique must be employed in order to distribute hours across rank-equivalents.

We do know, empirically, that the more senior a position the elected or appointed officer holds, the more likely he/she is to work full-time (or more!) on Auxiliary business. We also know that, on the other end of the scale, a very sizeable contingent contributes little. In between, we know that the average ENS-equivalent officer contributes fewer hours to the Auxiliary than members holding higher rank-equivalents. Therefore, a set of raw weighting factors were heuristically devised to capture the elements being weighted (in this case, notional work content). The actual applied weights must be subject to the condition that the total number of 99a hours is constrained to that reported in AUXDATA, viz., 1,461,317 hours. This can be done by utilizing a Goal Seek function, embedded in Excel, that can compute an applied weight that maintains the same ratio as the raw weight, while satisfying the boundary constraint that the sum of all 99a hours must match that reported.

The mathematical underpinnings of the process are shown in the shaded area below, using 99a (Leadership) as an example, and captured in the spreadsheet that follows.

In order to develop the weighted average cost,

- let  $i$  be the index that cycles through the 8 steps from ENS to RADM rank-equivalency
- let  $N_i$  be the number of rank-equivalent members assigned to the  $i^{\text{th}}$  rank-equivalent
- let  $W_i$  be the applied weight assigned to the members holding the  $i^{\text{th}}$  rank-equivalent
- let  $\$i$  be the hourly cost associated with the  $i^{\text{th}}$  rank-equivalent

Then, the weighted average cost across all rank-equivalents, denoted  $\bar{\$}$  is:

$$\bar{\$} = \frac{\sum_{i=ENS}^{RADM} N_i W_i \$i}{\sum_{i=ENS}^{RADM} N_i W_i}$$

			1	2	3	4	5	6	7	8	9	10	11	12	13	14
Office	Equivalent Rank	Number	Equivalent Rank	Number	Hourly Cost	Raw 99a	Applied	Raw 99b-e	Applied	Weighted 99a Hours	Weighted 99b-e Hours	Weighted 99a-e Hours	99a	99b-e	Weighted	Weighted
						Weight	99a Weigh	Weight	99b-e Weig				Cost Total	Cost Total	99a Number	99b-e Number
<b>National Staff</b>																
NACO	RADM	1	RADM	1	\$145		1.000		0.00	2,080	0	2,080	\$145	\$0	1.0	0.0
VNACO	RDML	1	RDML	5	\$140		1.000		0.00	10,400	0	10,400	\$700	\$0	5.0	0.0
DNACO	RDML	4	CAPT	24	\$126	30	0.538	1	0.004	26,840	208	27,049	\$1,626	\$13	12.9	0.1
ANACO	CAPT	8	CDR	135	\$111	20	0.358	2	0.008	100,651	2,343	102,994	\$5,371	\$125	48.4	1.1
N-staff/ANACOd	CDR	56	LCDR	588	\$98	10	0.179	2	0.008	219,196	10,205	229,400	\$10,327	\$481	105.4	4.9
DIR	CDR	15	LT	1129	\$84	3	0.054	3	0.013	126,261	29,391	155,652	\$5,099	\$1,187	60.7	14.1
DIRd	LCDR	15	LTJG	2966	\$70	2	0.036	3	0.013	221,134	77,213	298,347	\$7,442	\$2,599	106.3	37.1
DVC	LCDR	70	ENS	7663	\$54	1	0.018	4	0.017	285,663	265,984	551,647	\$7,416	\$6,905	137.3	127.9
BC	LT	223	PO3	4708.5	\$45		0.000	4	0.017	0	163,433	163,433	\$0	\$3,536	0.0	78.6
BA	LTJG	129	Inactive	4708.5	\$0		0.000		0.00	0	0	0	\$0	\$0	0.0	0.0
			<b>Total</b>	<b>21928</b>						<b>992,224</b>	<b>548,777</b>	<b>1,541,001</b>	<b>\$38,127</b>	<b>\$14,845</b>	<b>477.0</b>	<b>263.8</b>
													\$79.93 >> weighted average 99a hourly cost			
													\$56.27 >> weighted average 99b-e hourly cost			
<b>Districts/Regions</b>																
DCO	CAPT	16														
DCOS	CDR	16														
DCAPT	CDR	48														
DSO	LCDR	344														
ADSO	LT	747														
DCDR	LCDR	159														
VCDR	LT	159														
SO	LTJG	2091														
FC	LTJG	746														
VFC	ENS	713														
FSO	ENS	6950														
Member	PO3	9417														
all officers		12511														
all members		21928														

Column 1-3: the equivalent rank, number of Auxiliary officers rated at that equivalent-rank, and their hourly cost. This information is identical to that in the table on page 8. For members that are not elected or appointed officers, half are considered to be third class petty officer-equivalent, and the other half are considered inactive.

Columns 4-5: these apply to elected and appointed officers only. The raw relative weights in column 4 relate the relative time consumption of the job content and grows with rank-equivalence. For example, a LT-equivalent (e.g., an ADSO or BC) would expend three times the effort as an ENS-equivalent (e.g., an FSO), while a CAPT-equivalent (e.g., DCO or ANACO) would expend three times that of LCDR-equivalent (e.g., DCDR or DVC). The most senior leadership (NACO/VNACO/DNACO) are assumed full time. The applied weights in column 5 are obtained by using the “Goal Seek” function in Excel to maintain the assumed ratios while forcing the sum of 99a hours to match the number in AUXINFO (1,461,317).

Columns 6-7: these apply to all members. The raw relative weights in column 6 relate to Code 99 time that is not in pursuit of leadership activities, i.e., Codes 99b through 99e, and diminish as rank-equivalence increases. The logic is that the less senior members (including those without elected or appointed office) will be more likely to be involved in training, marine safety, RBS, etc. than their more senior colleagues who are typically consumed with their leadership responsibilities. The applied weights in column 7 are obtained by using the “Goal Seek” function in Excel to maintain these ratios while forcing the sum of 99b-e hours to match the number in AUXINFO (977,529).

Columns 8-9: these are the number of work hours, computed by multiplying the number of members at a rank-equivalent (column 2) by 2,080 hours/year, by the applied weight in either column 5 (for 99a) or 7 (for 99b-e).

Column 10: the sum of columns 8 and 9.

Columns 11-12: the weighted cost per rank-equivalent. Computed by multiplying the number of members of a given rank-equivalent (column 2) by their respective hourly cost (column 3) by the applied weight (column 5 for 99a or column 7 for 99b-e). The total across all rank equivalents is at the bottom.

Columns 13-14: the weighted number of members per rank-equivalent. Computed by multiplying the number of members of a given rank-equivalent (column 2) by the applied weight (column 5 for 99a or column 7 for 99b-e). The total across all rank equivalents is at the bottom.

In the lower right hand corner, the weighted average hourly cost for 99a is the column 11 total divided by the column 13 total, and the weighted average hourly cost for 99b-e is the column 12 total divided by the column 14 total.

The weighted average cost for officers (99a) is \$79.93, almost that of a LT; the weighted average for all members (99b through 99e) is \$56.27, a little more than an ENS or an E-5.