Metropolitan Washington
Council of Governments

MEMORANDUM

TO: Cooperative Forecasting and Data Subcommittee
FROM: DCPS Staff
SUBJECT: Update to Suggested Baseline Employment Estimates
DATE: March 18, 2022

This memo provides an update to the suggested baseline employment estimates for the Metropolitan Washington Council of Government's Cooperative Forecasting program.

The baseline employment estimates are updated to reflect new and revised federal employment estimates, including: (1) revised 2010-2019 and new 2020 Bureau of Labor Statistics estimates, (2) 2019 and 2020 Census Public Use Microdata Sample (PUMS) 1-Year files, and (3) derived military estimates.[1] While described in detail, there is no change to the suggested approach for baseline employment estimates. It is recommended that the new 2020 baseline employment be the baseline for the Round 10 Cooperative Forecast.

Table 1 Suggested Baseline Employment Estimates (Thousands), 2010, 2015, 2016-2020

Jurisdiction	2010	2015	2016	2017	2018	2019	2020
District of Columbia	756.02	802.93	815.00	819.48	832.98	833.02	785.89
Arlington County	184.12	197.27	200.64	204.98	210.88	211.54	205.66
Alexandria City	105.63	106.77	104.87	105.75	105.03	101.59	96.29
Montgomery County	495.77	515.19	513.44	526.40	525.63	530.49	495.71
Prince George's County	345.41	350.19	361.09	369.17	372.59	375.50	343.47
Fairfax County	636.60	651.45	670.73	677.63	694.62	709.54	676.57
City of Fairfax	21.83	21.58	21.52	21.48	22.16	22.28	20.48
City of Falls Church	13.61	12.73	13.10	13.55	13.99	13.88	12.38
Loudoun County	145.32	170.48	178.79	184.07	190.05	200.07	190.23
Prince William County	120.33	138.97	145.12	145.56	149.99	156.42	147.92
City of Manassas	26.07	25.12	25.32	25.01	25.07	26.68	25.89
City of Manassas Park	3.10	3.29	3.67	3.92	4.11	4.30	4.32
Charles County	45.31	48.97	49.25	48.10	47.83	48.30	43.87
Frederick County	102.33	107.77	109.46	111.66	114.46	117.82	109.25
Region	3,001.43	3,154.45	3,211.98	3,256.74	3,309.38	3,351.44	3,157.92

---

[1] Military estimates are a function of Baseline Reports 2010-2014, and 2016 and the Defense Manpower Data Center Personnel Data. For more detail, see page 6.

METHODOLOGY

Below is an overview of how the baseline employment estimates are developed using the latest available data from the following sources:

- Quarterly Census for Employment and Wages (QCEW)
- Current Employment Statistics (CES)
- American Community Survey (ACS)
- Defense Manpower Data Center (DMDC)

While the 2018 baseline employment estimates include latest data from specified sources, given data limitations, not all referenced data is from the year 2018. To account for mismatched data availability, a series of smoothing-oriented assumptions were considered in order to produce estimates that perform a semblance of continuity. As a note, the BLS data in particular is subject to post hoc revision, though any changes are typically small.
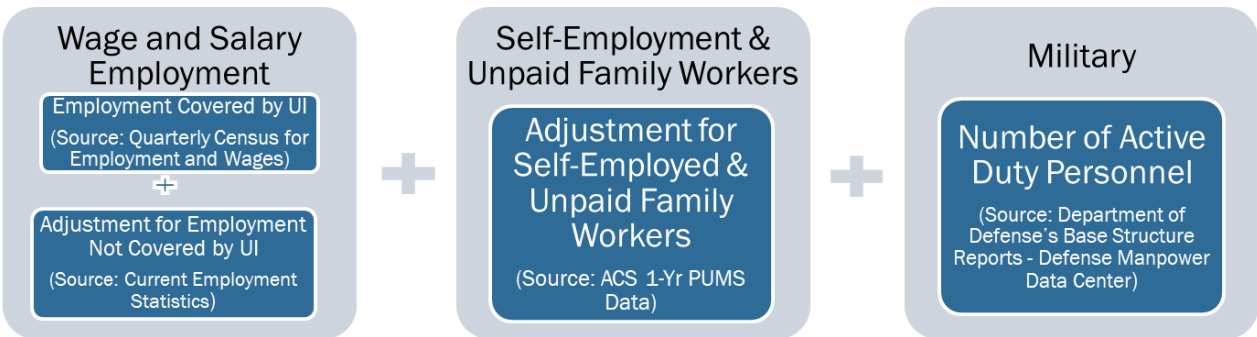

Figure 1 Baseline Employment Method Overview

Figure 2 Baseline Employment Method Detailed

Ultimately, to obtain the baseline employment, as outlined in Figure 2, the QCEW is multiplied by the CES Adjustment Factor to produce the total wage and salary employment. Next, the total wage and salary employment is multiplied by the Self-Employment (and Unpaid Family Workers) Adjustment Factor to produce total civilian employment. Finally, military employment is added to obtain total employment.

1. Wage and Salary Employment

The Wage and Salary Employment component entails data from the Bureau of Labor Statistics' (BLS) Quarterly Census for Employment and Wages (QCEW) program and the Current Employment Survey (CES).

Employment Covered by Unemployment Insurance (UI)

The Wage and Salary Employment component entails data from the Bureau of Labor Statistics' (BLS) Quarterly Census for Employment and Wages (QCEW) program.[2] These estimates are shown, in thousands, in the below table.

Table 2 Employment Covered by Unemployment Insurance, 2020 (Thousands)

Jurisdiction	Employment
District of Columbia	726.08
Arlington County	174.42
Alexandria City	83.92
Montgomery County	439.26
Prince George's County	295.52
Fairfax County	591.64
City of Fairfax	18.02
City of Falls Church	10.90
Loudoun County	165.17
Prince William County	125.25
City of Manassas	22.41
City of Manassas Park	3.74
Charles County	38.44
Frederick County	96.98
Region	**2,791.75**

Source: BLS QCEW

Employment covered by the UI programs represents about 95% of wage and salary civilian employment in the country. While there are slight differences in coverage between the District of Columbia (DC), Maryland (MD), and Virginia (VA) (see Appendix A), the following types of employment are typically excluded by UI coverage:

- Unincorporated self-employed workers
- Unpaid family workers
- Agricultural workers on small farms
- Religious organizations
- Very small non-profit organizations
- Railroad workers

---

[2] QCEW, also known as the ES-202 program, publishes a quarterly count of employment and wages of establishments which report to the unemployment insurance (UI) programs of the United States.

- Service by students and spouses of students in the employ of a school, college, or university by a student enrolled and regularly attending classes at such school; spouse is excluded provided employment is under a program designed to give financial assistance to the student
- Domestic service in a private home, local college club, or local chapter of a college fraternity or sorority.
- Service performed for government entities:
  - As an elected official;
  - As a member of a legislative body or a member of the judiciary;
  - As a member of the state National Guard or Air National Guard;
  - As an employee serving on a temporary basis in case of fire, storm, snow, earthquake, flood, or similar declared emergency;
  - In a position which, under the state law, is designated as a major, non-tenured, policymaking or advisory position, or a part-time policymaking position which ordinarily requires 8 or fewer hours a week;
  - Or as a member of the military
- U.S. residents employed by foreign government (including embassies and consulates) or international organization
- Military and certain national security agencies
- Commissioned Corps of the National Oceanic and Atmospheric Administration
- Individuals serving on a temporary basis in case of fire, storm, earthquake, or other similar emergency
- Individuals employed under a Federal relief program to relieve them from unemployment

Employment Not Covered by UI

Data from BLS' Current Employment Statistics (CES) program is used to account for wage and salary civilian employment that is not covered by UI.[3] The CES has a broader definition of employment than the QCEW and includes persons on establishment payrolls who worked or received pay for any part of the pay period that includes the 12th day of the month. BLS constructs an annual benchmark for its CES program to (1) realign the sample-based employment totals with the UI based counts for March, and (2) account for wage and salary civilian employment not covered by UI[4].

However, unlike QCEW, the CES is not published at the County level. The lowest level of geography at which the CES is available is the metropolitan areas and divisions. As shown in Table 3 and 4, estimates for the National Capital Region and Northern Virginia were derived respectively in order to:

---

[3] CES accounts for industry estimates of nonfarm employment, hours, and earnings of workers on payrolls.
[4] Sources of data used to account for noncovered employment include: Railroad Retirement Board, Census Bureau's County Business Patterns and Annual Survey of Public Employment and Payroll (ASPEP), and Labor Market Information Agencies (LMI).

- adjust and help better geographically match MWCOG's planning area and TPB's modeled region
- derive and apportion relative non-covered employment for COG jurisdictions aligned with CES metro designations

For the National Capital Region, the employment estimates for the following areas are used

- District of Columbia
- 43524 – Silver Spring- Frederick-Rockville, MD Metropolitan Division,
- 94781 – Calvert County, Charles County, Prince George's County.

For Northern Virginia, employment was derived by subtracting the total employment of the following areas from the CES designated 47894- Washington-Arlington-Alexandria, D.C.-Va.-Md.-W.Va. Metropolitan Division[5]

- District of Columbia
- 94781 - Calvert County, Charles County, Prince George's County

Table 3 Wage and Salary Civilian Employment for Northern Virginia (Thousands), 2020

Metropolitan Area or Division	Employment
47894- Washington-Arlington-Alexandria, D.C.-Va.-Md.-W.Va. Metropolitan Division	2,429.40
District of Columbia	726.08
94781 - Calvert County, Charles County, Prince George's County	354.78
Northern Virginia	1,348.53

Source: BLS CES

After identifying and assigning the appropriate relative CES values for COG jurisdictions, a CES Wage and Salary Adjustment Factor, the ratio of CES to QCEW, is derived and makes the following assumption:

- COG jurisdictions within a given CES designation, the ratio of covered employment to non-covered employment is constant.

As shown in Table 4, in order to arrive at this ratio, QCEW values were aggregated as appropriate for all jurisdictions aligned with a given CES designation (to establish the same geographic basis for comparison). It should be noted that these adjustment factors vary over time due to cyclical and structural changes in the region's economy.

---

[5]This leaves a CES value that covers Northern Virginia as well as Jefferson County, WV. While BLS produces a separate estimate for the non-standard CES Area, Northern Virginia, that area also covers Culpeper County and Rappahannock County (and now Madison County).

Table 4 CES Adjustment Factors, 2020

Jurisdiction	CES State or Metro Area	QCEW (Thousands)	CES (Thousands)	Adjustment factor
District of Columbia	District of Columbia	726.08	747.20	1.03
Montgomery, Frederick	43524 - Silver Spring-Frederick-Rockville, MD Metropolitan Division	536.24	559.90	1.04
Calvert, Charles, Prince George's	94781 - Calvert County, Charles County, Prince George's County	354.78	385.00	1.09
Arlington, Clarke, Fairfax, Fauquier, Loudoun, Prince William, Spotsylvania, Stafford, Warren, City of Alexandria, City of Fairfax, City of Falls Church, City of Fredericksburg, City of Manassas, City of Manassas Park, Jefferson County, WV	47894 - Washington-Arlington-Alexandria, DC-VA-MD-WV Metropolitan Division **minus sum** (District of Columbia **and** 94781 - Calvert County, Charles County, Prince George's County)	1,348.53	1,458.80	1.08
Region		**2,965.64**	**3,150.90**	**1.06**

Source: BLS CES and QCEW

1. Self-Employment and Unpaid Family Workers

Self-employed as well as unpaid family workers should also be included in the employment estimate. The Census Bureau's American Community Survey (ACS) provides data on the class of worker including wage and salary, self-employed not incorporated, and unpaid family worker. The Public Use Microdata Sample (PUMS) 1-Year files are used to summarize the data by place of work.

The availability of the ACS data usually lags the other data sets reference by about 1 year, so in this instance, in order to normalize the self-employed relative to 2020 wage and salary employment (previously derived), a time-based adjustment factor is produced applying "forward" the ACS-specific relationship between total workers and wage and salary employment (presuming self-employed as the differential between total workers and wage and salary). The ratio, as shown in Table 5, is constituted by the following:

- the ratio of total workers (the sum of covered employment plus self-employed not incorporated and unpaid family workers) to covered employment

Please note that this assumes:

- The relationship between wage and salary and total workers enumerated in the ACS, applies to the QCEW-CES adjusted wage and salary employment
- The 2017 relationship was constant and applicable for 2018

For the baseline employment estimates shown in Table 1, the 2013 Self-Employment (and Unpaid Family Workers) Adjustment Factor is applied to the CES adjusted wage and salary employment for years prior to 2015 (in 2010), and the 2015 Self-Employment Adjustment Factor is applied to the CES adjusted wage and salary employment for 2015, the 2016 Self-Employment Adjustment factor is applied to the CES adjusted wage and salary employment for 2016, and the 2017 Self-Employment Adjustment factor is applied to the CES adjusted wage and salary employment for 2016 and 2017. The 2018, 2019, and 2020 Self-Employment Adjustment factors are applied to the CES adjusted wage and salary employment for 2018, 2019, and 2020.

Table 5 Self-Employment (and Unpaid Family Workers) Adjustment Factor, 2020

Jurisdiction	Wage and Salary Employment (Thousands)	Self-Employed Not Incorporated & Unpaid Family (Thousands)	Total Workers (Thousands)	Self-Employment Factor
District of Columbia	663.21	27.02	690.23	1.04
Arlington County	180.58	6.75	187.33	1.04
City of Alexandria	94.34	5.73	100.06	1.06
Montgomery County	472.07	33.74	505.81	1.07
Prince George's County	337.19	17.55	354.73	1.05
Fairfax County / City of Fairfax / City of Falls Church	653.08	32.73	685.81	1.05
Loudoun County	205.02	13.27	218.29	1.06
Prince William County/ City of Manassas / City of Manassas Park	178.50	12.11	190.60	1.07
Charles County	43.47	1.68	45.14	1.04
Frederick County	112.48	7.82	120.30	1.07
Region	2,939.92	158.38	3,098.30	1.05

Source: Census ACS PUMS 1-Year Files

2. Military

The Department of Defense's (DOD) Base Structure reports include an appendix with Personnel Data from the Defense Manpower Data Center (DMDC). However, in recent years the personnel data has not been included in the base reports. The below table reports an estimated value of Active Duty Total by County which relates the county specific data featured in base structure reports to the state level data reported by the DMDC.

These estimates make the following assumptions:

- The DOD Base structure data is the same data being reported by DMDC just at a more granular level
- The aggregate of the base report data for all counties in a given state, with reasonable margin for error, reflects state totals being reported by DMDC
- A given county's share of a state's military total is relatively constant over time.

Operating on these assumptions, a distribution factor was developed for each COG jurisdiction to apportion the 2017 and 2018 state totals reported by the Defense Manpower Data Center.

Table 6 Military Active-Duty Employment Estimate (Thousands), 2017,2018,2019, and 2020

Jurisdiction	2017	2018	2019	2020
District of Columbia	9.95	9.93	8.25	8.25
Arlington County	8.57	12.13	9.92	9.92
City of Alexandria	0.02	0.02	0.00	0.00
Montgomery County	4.25	4.29	4.29	4.29
Prince George's County	5.62	5.68	6.10	6.10
Fairfax County	4.32	6.12	4.47	4.47
City of Fairfax	0.00	0.00	0.00	0.00
City of Falls Church	0.00	0.00	0.00	0.00
Loudoun County	0.00	0.00	0.00	0.00
Prince William County	2.48	3.49	3.23	3.23
City of Manassas	0.00	0.00	0.00	0.00
City of Manassas Park	0.00	0.00	0.00	0.00
Charles County	0.73	0.74	0.55	0.55
Frederick County	0.94	0.95	0.95	0.95
Region	**36.86**	**43.35**	**37.76**	**37.76**

Source: COG, DOD Base Structure Report

In cases where jurisdiction staff is in direct contact with the military and is provided with a direct source of military employment estimates, COG recommends using those and requests the data be shared with the Cooperative Forecasting Committee. In addition, employment estimates that reflect the presence of the Central Intelligence Agency, National Security Agency, the National Imagery and Mapping Agency, and/or the Defense Intelligence Agency, should be included as well.

As of May 2021, the last Department of Defense's (DOD) Base Structure report continues to be the FY18 report. Unlike the military estimate for 2018, for the 2019 military estimate, COG staff consulted with members of the Cooperative Forecasting Committee or COG staff would research a variety of sources to obtain a military estimate for 2019. In some cases, members would consult with a military contact to confirm a military 'Active Duty" estimate for their jurisdiction. It was determined that Marine Corps Base Quantico should be evenly split the "Active Duty" estimate between Prince William and Stafford counties. An adjustment (~3,500) was made to the Prince William County military estimate for years 2015 – 2018 to take this in account. This would change baseline employment totals for Prince William County and the region. For 2020, COG staff would consult with local staff and adjust as necessary.

RESULTS

To obtain the baseline employment, as outlined in Figure 2, the QCEW is multiplied by the CES Adjustment Factor to produce the total wage and salary employment. Next, the total wage and salary employment is multiplied by the Self-Employment (and Unpaid Family Workers) Adjustment Factor to produce total civilian employment. Finally, military employment is added to obtain total employment.

Table 7 Baseline Employment, 2020

Jurisdiction	QCEW (Thousands)	CES Adjustment Factor	Self-Employment Adjustment Factor	Military Employment (Thousands)	Baseline Employment (Thousands)
District of Columbia	726.08	1.03	1.04	8.24	785.89
Arlington County	174.42	1.08	1.04	9.91	205.66
City of Alexandria	83.92	1.08	1.06	0.00	96.29
Montgomery County	439.26	1.04	1.07	4.29	495.71
Prince George's County	295.52	1.09	1.05	6.09	343.47
Fairfax County	591.64	1.08	1.05	4.47	676.57
City of Fairfax	18.02	1.08	1.05	0.00	20.48
City of Falls Church	10.90	1.08	1.05	0.00	12.38
Loudoun County	165.17	1.08	1.06	0.00	190.23
Prince William County	125.25	1.08	1.07	3.23	147.92
City of Manassas	22.41	1.08	1.07	0.00	25.89
City of Manassas Park	3.74	1.08	1.07	0.00	4.32
Charles County	38.44	1.09	1.04	0.55	43.87
Frederick County	96.98	1.04	1.07	0.95	109.25
Region	**2,791.75**	**1.06**	**1.05**	**37.761**	**3,157.92**

RECOMMENDATION

For consistency purposes, COG suggests the method described in this memo be used to develop baseline employment estimates for the Cooperative Forecasting Program.[6] If jurisdictions have access to additional data to inform these baseline employment estimates or choose to utilize a different methodology, please share it with the Committee and include a description as a part of the transmittal package.

---

[6] Please note the method used to derive active duty military employment is an option to consider, not necessarily a suggestion.

NOTE

This approach is tailored for jurisdictions where estimates from the Bureau of Labor Statistics (BLS) Quarterly Census of Employment and Wages (QCEW) are available. While the QCEW is published for independent cities in Virginia, this data is not available for cities in Maryland. It is recommended that cities in Maryland should work with their surrounding county and use other existing resources to develop Baseline Employment Estimates.

SOURCES
https://www.bls.gov/cew/datatoc.htm
https://download.bls.gov/pub/time.series/sm/
http://workforcesecurity.doleta.gov/unemploy/pdf/uilawcompar/2015/coverage.pdf
http://www.irs.gov/Individuals/International-Taxpayers/Persons-Employed-by-a-Foreign-Government-or-International-Organization---FUTA
http://www.bls.gov/cew/cewfaq.htm#Q14

CREATE CUSTOMIZED TABLES – BLS WEBSITE

Employment, Hours, and Earnings – State and Metro Areas
(Current Employment Statistics – CES)
 https://data.bls.gov/cgi-bin/dsrv?sm

State and County Employment and Wages
(Quarterly Census of Employment & Wages – QCEW)
https://data.bls.gov/cgi-bin/dsrv?en

ATTACHMENTS
Appendix A. Employment Not Covered by QCEW

Metropolitan Washington Council of Governments

Employment Not Covered by Unemployment Insurance (UI)		District of Columbia	Maryland	Virginia
Self-Employment		X	X	X
Unpaid Family Workers		X	X	X
Religious Organizations	A church, convention, or association of churches	X	X	X
	An organization operated primarily for religious purposes, which is operated, supervised, controlled, or principally supported by a church, convention, or association of churches	X	X	X
	An elementary or secondary school operated primarily for religious purposes, regardless of affiliation with a church, convention, or association of churches	X	X	X
Non-Profit Organizations with 4 or fewer Employees		Expanded coverage provisions beyond Federal Requirements, States cover organizations with 1 or more employees	Expanded coverage provisions beyond Federal Requirements, States cover organizations with 1 or more employees	X
Railroad Workers		X	X	X
Insurance Agents on Commission		X	X	X
Real Estate Agents on Commission			X	X
Part-time Service for Nonprofit Organizations Exempt from Federal Income Tax		X	X	X

Not Covered by QCEW		District of Columbia	Maryland	Virginia
Service by Students and Spouses of Students in the employ of a school, college, or university by a student enrolled and regularly attending classes at such school; Spouse is excluded provided employment is under a program designed to give financial assistance to the student	Student Nurses and Interns in Employ of a Hospital	X	X	X
	Students Working for Schools	X (Do not exclude service by the spouse of a student in the employ of the school)	X	X (Do not exclude service by the spouse of a student in the employ of the school)
Domestic service in a private home, local college club, or local chapter of a college fraternity or sorority.		Quarterly payroll less than $500	Quarterly payroll less than $1,000	Exclude: (1) Medical services performed by an individual employed to perform those services in a private residence or medical institution if the employing unit is the person receiving the services; and (2) services performed under agreement with a Public Human Service Agency in the home of the recipient of the service or the provider of the service

Not Covered by QCEW	District of Columbia	Maryland	Virginia
Government Entities, service performed: • As an elected official; • As a member of a legislative body or a member of the judiciary; • As a member of the state National Guard or Air National Guard; • As an employee serving on a temporary basis in case of fire, storm, snow, earthquake, flood, or similar declared emergency; • in a position which, under the state law, is designated as a major, non-tenured, policymaking or advisory position, or a part-time policymaking position which ordinarily requires 8 or fewer hours a week • Military	X	X	X
U.S. Residents employed by Foreign Government (including embassies and consulates) or International Organization located within the U.S.	X	X	X

X=Not covered by UI (not represented in QCEW)