

**Job and Household Allocation; Expected Tax Revenue
DoD BRAC Movements into Maryland**

December 2006

Prepared on behalf of:

The Maryland Department of Business and Economic Development
Office of Military and Federal Affairs
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1.0 Executive Summary

RESI was tasked with producing the economic and fiscal impacts for Maryland arising from the BRAC decisions. Our findings and assumptions are premised on the report produced by SAIC entitled “BRAC Activities Affecting Aberdeen Proving Grounds, Andrews Air Force Base, Bethesda Naval Hospital and Fort Meade in the State of Maryland”, March 31st, 2006.

The SAIC report details to the extent that the information was available to SAIC, the number and types of jobs likely to move to Maryland between 2006 and 2020 as well as the likely payroll accompanying these jobs.

To conduct this analysis, RESI (along with the Maryland Department of Planning and the Baltimore Metropolitan Council) made several assumptions regarding the phasing of the BRAC impacts, the number of individuals who would move with their jobs (civilian and contractors) into Maryland as well as the distribution of the jobs within Maryland. These will be detailed in the body of the report

To determine which Counties the employees of the BRAC related jobs would likely reside in, RESI relied on commuting patterns data from the 2000 census as well as input from the Maryland Department of Planning and the Baltimore Metropolitan Council. RESI made several assumptions regarding household income and home purchases. Our general findings are summarized as follows:

- over 45,000 jobs of which 15,000 are direct jobs, 22,000 indirect jobs and the balance are induced jobs;
- the average wages of all these new jobs are over \$70,000;
- the average household income of households likely to move to Maryland due to BRAC exceeds \$110,000;
- the annual income and property tax revenues (local and state) approach half billion dollars derived from the nearly 28,000 new households estimated to locate to Maryland;
- Anne Arundel County will see its household population increase by nearly 4,500;
- Harford County will see its household population increase by over 6,500; and
- of the 28,000 household, over 24,000 are predicted to be homeowners.

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Table 1: Summary of BRAC Job Impacts by County

County	Direct	Indirect (non-embedded contractors)	Indirect (all others)	Induced	Total
Anne Arundel	5,718	922	1,903	1,506	10,049
Baltimore	-	1,678	1,676	544	3,898
Cecil	-	750	523	1,329	2,602
Harford	9,155	870	939	1,748	12,712
Howard	-	581	1,500	178	2,259
Montgomery	-	500	3,673	63	4,236
Prince George's	400	500	2,297	266	3,463
Baltimore City	-	1,932	823	390	3,145
Rest of MD	-	267	1,388	1,213	2,868
Total	15,273	8,000	14,722	7,237	45,232

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Table 2: Summary of BRAC Job Impacts by NAICS

Industrial Sector	Direct	Indirect (non- embedded contractors)	Indirect (all others)	Induced	Total
Agriculture	-	-	18	39	57
Mining	-	-	2	3	5
Utilities	-	-	34	20	54
Construction	-	-	309	77	386
Manufacturing	-	-	528	174	702
Wholesale Trade	-	-	248	197	445
Transportation and Warehousing	1,749	590	1,038	200	3,577
Retail Trade	-	-	279	1,327	1,606
Information	2,727	2,000	1,822	82	6,631
Finance and Insurance	-	-	419	318	737
Real Estate and Rental and Leasing	-	-	933	235	1,168
Professional, Scientific and Technical Services	7,421	3,936	3,759	342	15,458
Management of Companies and Enterprises	1,841	804	82	24	2,751
Administrative and Support and Waste Management and Remediation Services	860	592	3,470	324	5,246
Educational Services	-	-	48	267	315
Health Care and Social Services	-	-	1	1,440	1,441
Arts, Entertainment and Recreation	-	-	441	234	675
Accommodation and Food Services	-	-	676	869	1,545
Other Services*	675	78	534	599	1,886
Government	-	-	81	466	547
Total	15,273	8,000	14,722	7,237	45,232

* Other Services NAICS classification includes Repair and Maintenance; Personal and Laundry Service; Religious, Grantmaking, Civic, Professional and Similar Organizations; and Private Households.

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Table 3: Summary of BRAC Wages by NAICS

NAICS Sectors	Direct	Indirect (Non- Embedded Contractors)	Indirect	Induced	Total
Agriculture			\$22,598	\$13,866	\$17,053
Mining			\$46,396	\$27,931	\$34,646
Utilities			\$145,760	\$108,320	\$143,337
Construction			\$49,844	\$43,007	\$49,971
Manufacturing			\$59,580	\$50,740	\$59,123
Wholesale Trade			\$65,021	\$56,703	\$64,988
Transportation and Warehousing	\$69,136	\$89,963	\$44,004	\$14,532	\$62,764
Retail Trade			\$27,226	\$24,115	\$27,217
Information	\$98,258	\$105,380	\$79,333	\$51,874	\$80,731
Finance and Insurance			\$65,593	\$53,367	\$63,110
Real Estate and Rental and Leasing			\$34,903	\$27,072	\$34,108
Professional, Scientific and Technical Services	\$110,118	\$129,044	\$66,336	\$42,128	\$96,644
Management of Companies and Enterprises	\$97,082	\$90,045	\$61,817	\$53,682	\$93,460
Administrative and Support and Waste Management and Remediation Services	\$82,366	\$90,071	\$27,992	\$23,266	\$43,279
Educational Services			\$39,814	\$28,715	\$33,256
Health Care and Social Services			\$62,265	\$37,128	\$41,764
Arts, Entertainment and Recreation			\$20,530	\$16,019	\$19,418
Accommodation and Food Services			\$20,576	\$15,754	\$18,708
Other Services	\$51,139	\$90,237	\$34,650	\$23,511	\$37,972
Government			\$58,295	\$54,311	\$60,207
Total	\$97,566	\$113,064	\$49,316	\$31,752	\$70,388

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Table 4: Summary of BRAC Household Impacts

County	Direct	Indirect (Non-Embedded Contractors)	Indirect	Induced	Total
Anne Arundel	2,044	583	1,142	689	4,457
Baltimore	749	1,215	1,178	511	3,653
Cecil	472	393	332	800	1,997
Harford	4,397	594	607	936	6,533
Howard	650	325	725	154	1,853
Montgomery	131	288	1,777	78	2,274
Prince George's	389	277	1,169	161	1,996
Baltimore City	365	1,057	777	349	2,548
Rest of MD	313	374	1,354	824	2,864
Total	9,509	5,105	9,061	4,501	28,176
<i>Average Household Income</i>	<i>\$155,957</i>	<i>\$180,730</i>	<i>\$78,830</i>	<i>\$50,755</i>	<i>\$112,513</i>

Table 5: Summary of BRAC Homeowner Impacts

County	Direct	Indirect (Non-Embedded Contractors)	Indirect	Induced	Total
Anne Arundel	1,748	520	973	588	3,829
Baltimore	641	1,087	1,004	436	3,167
Cecil	388	353	286	682	1,709
Harford	3,775	530	517	797	5,620
Howard	557	291	617	131	1,596
Montgomery	112	258	1,514	66	1,951
Prince George's	333	248	996	137	1,714
Baltimore City	314	945	662	296	2,218
Rest of MD	270	341	1,155	702	2,468
Total	8,137	4,575	7,724	3,835	24,271

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Table 6: Summary of BRAC Renter Impacts

County	Direct	Indirect (Non-Embedded Contractors)	Indirect	Induced	Total
Anne Arundel	295	63	169	101	627
Baltimore	107	129	174	76	486
Cecil	26	98	46	118	289
Harford	622	63	90	138	913
Howard	93	34	107	23	257
Montgomery	19	30	263	11	324
Prince George's	56	29	173	24	282
Baltimore City	51	112	115	53	331
Rest of MD	45	40	201	122	408
Total	1,315	598	1,338	666	3,917

Table 7: Summary of BRAC Tax Revenue Impacts

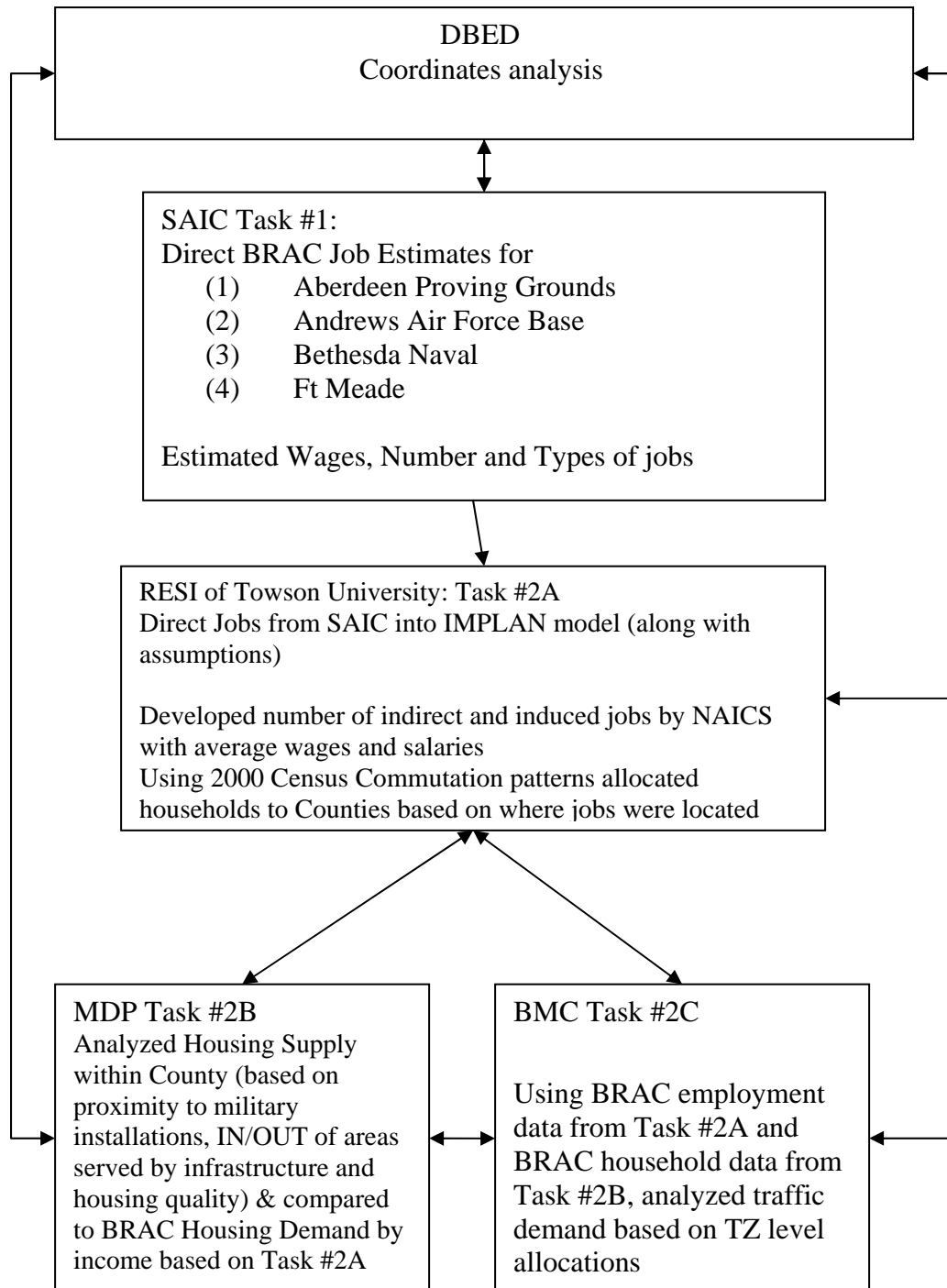
County	Local		State			Total
	Property Taxes	Income Taxes	Property taxes	Income taxes	Other State and Local taxes	
Anne Arundel	\$ 18,481,483	\$11,662,701	\$ 2,582,744	\$ 20,500,841	\$ 17,134,567	\$ 70,362,336
Baltimore	\$ 18,291,485	\$10,692,025	\$ 2,165,449	\$ 17,001,453	\$ 14,209,784	\$ 62,360,196
Cecil	\$ 8,193,425	\$ 4,947,376	\$ 977,161	\$ 7,951,139	\$ 6,645,548	\$ 28,714,648
Harford	\$ 36,877,473	\$22,563,000	\$ 4,229,171	\$ 33,180,882	\$ 27,732,523	\$124,583,048
Howard	\$ 8,368,150	\$ 5,976,412	\$ 1,058,042	\$ 8,404,330	\$ 7,024,324	\$ 30,831,257
Montgomery	\$ 5,384,138	\$ 5,752,785	\$ 980,151	\$ 8,089,854	\$ 6,761,486	\$ 26,968,414
Prince George's	\$ 7,868,875	\$ 5,605,140	\$ 972,469	\$ 7,882,227	\$ 6,587,952	\$ 28,916,663
Baltimore City	\$ 27,389,589	\$ 8,277,201	\$ 1,566,476	\$ 12,212,263	\$ 10,206,988	\$ 59,652,517
Rest of MD	\$ 10,170,873	\$ 6,283,477	\$ 1,214,958	\$ 9,966,387	\$ 8,329,889	\$ 35,965,584
Total	\$141,025,489	\$81,760,115	\$15,746,621	\$125,189,377	\$104,633,060	\$468,354,662

2.0 Introduction

RESI was tasked with producing the economic and fiscal impacts for Maryland arising from the BRAC decisions. Our findings and assumptions are premised on the report produced by SAIC entitled “BRAC Activities Affecting Aberdeen Proving Grounds, Andrews Air Force Base, Bethesda Naval Hospital and Fort Meade in the State of Maryland”, March 31st, 2006. The SAIC report details to the extent that the information was available to SAIC, the number and types of jobs likely to move to Maryland between 2006 and 2020 as well as the likely payroll accompanying these jobs.

To undertake the analysis of economic and fiscal impacts of the Base Realignment and Closure (BRAC) Commission’s decisions regarding Maryland, the State’s Department of Economic and Business Development (DBED) contracted with Science Applications International Corporation (SAIC), RESI of Towson University, Maryland’s Department of Planning (MDP) and the Baltimore Metropolitan Council (BMC). Each contractor was responsible for a specific portion of the study. Figure 1 illustrates the relationships between each of the work products.

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As indicated in figure 1, SAIC determined the number and type of direct BRAC jobs (direct civilian and embedded contractor jobs) associated with each installation. SAIC also estimated the number of BRAC non-embedded contractor jobs for Aberdeen Proving Grounds (APG) and Ft. Meade. SAIC determined the average BRAC salaries and payroll for each of these jobs. RESI used these data as inputs into their IMPLAN model, an input-output model, to determine the economic and fiscal impacts associated with the BRAC job movements.

3.0 Input Data

To undertake the analysis of determining the economic and fiscal impacts associated with the BRAC job movements, RESI employed data from the SAIC report dated March 31st, 2006. The data received from SAIC was further refined by mapping the jobs into the appropriate IMPLAN industry sectors. The number of jobs was easily identified from SAIC's report. For example, table 1 of RESI's analysis lists the direct jobs for Harford County as determined by SAIC in exhibit 5 of the SAIC report. Similarly, for the analysis of Andrews Airforce base (AFB), the direct jobs shown in table 1 for Prince Georges' County were drawn from exhibit 14 in SAIC's report. For Fort Meade, the direct jobs listed for Anne Arundel County were drawn from exhibit 25 in SAIC's report. In addition, there were 4,000 non-embedded contractor jobs that are likely to be located proximate to each installation.¹ The distribution of these jobs was based upon a 45 minute commuting pattern identified by the Baltimore Metropolitan Council. The distribution of the jobs by county can be seen in table 1.

The identification and categorization of the types of jobs moving to Maryland was more challenging given that these occupations were to be mapped into the appropriate IMPLAN industry sector. To begin the process of identifying the types of jobs expected to move to Maryland as a result of BRAC, RESI drew from exhibit 7 in the SAIC report (refers to APG). For Ft. Meade, RESI drew from exhibit 25 and section 5.1.3 "Educational Requirements". Since there was very little information regarding additional jobs expected to move to Maryland, RESI extrapolated information from exhibit 7, exhibit 25 and section 5.1.3 of SAIC's report to account for the balance of the jobs (both direct jobs-civilian DOD and embedded contractors and indirect jobs-non-embedded contractors). These are jobs slated to move to Maryland but were not specifically identified by job type in SAIC's report. RESI then assigned each of the job types to an IMPLAN industry sector based upon the predominance of those occupations in specific industry sectors as well as what was the primary mission of each of the organizations moving into Maryland as a result of BRAC. The distribution of direct jobs for all of the BRAC impacts by industry sector can be seen in table 2.

4.0 Output

RESI inputted the employment data from above into the IMPLAN Model, an input-output model that is based upon standard input-output techniques. Input-output analysis is a technique developed by Wassily Leontif in 1965.² In the most basic sense, it accounts for all of the inputs used to produce a particular good or service on a per dollar basis. This basic premise is then

¹ According to SAIC's report, both APG and Ft. Meade will receive between 3,000 and 5,000 non-embedded contractor jobs. For the purposes of the analysis, we assumed the number to be 4,000.

² He was awarded a Noble prize in Economics for his research in this area in 1973.

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expanded to all industries in the economy. So a perturbation to an industry will affect all of the industries in the economy, some to a larger degree and others to a lesser degree. This in turn affects other industries and so on and so on. The input output model captures all of these effects and enumerates them into an economic impact. In order to quantify the economic impact of the BRAC impacts considered in this analysis, RESI utilized the IMPLAN input/output model. This model enumerates the employment and fiscal impact of each dollar earned and spent by the following: employees of the new business, other supporting vendors (business services, retail, etc.), each dollar spent by these vendors on other firms and each dollar spent by the households of the new business' employees, other vendors' employees, and other businesses' employees.

To quantify the economic impact of a new business entering into an area, economists measure three types of economic impacts: direct, indirect, and induced impacts. The direct economic effects are generated as new businesses create jobs and hire workers to fill new positions. The indirect economic impacts occur as new firms purchase goods and services from other firms. In either case the increases in employment generate an increase in household income, as new job opportunities are created and income levels rise. This drives the induced economic impacts that result from households increasing their purchases at local businesses.

Consider the following example. A new firm opens in a region and directly employs 100 workers. The firm purchases supplies, both from outside the region as well as from local suppliers, which leads to increased business for local firms, thereby creating jobs for say, another 100 workers. This is called the indirect effect. The workers at the firm and at suppliers spend their income mostly in the local area, creating jobs for hypothetically another 50 workers. This is the induced effect. The direct, indirect, and induced effects add up to 250 jobs created from the original 100 jobs. Thus, in terms of employment, the total economic impact of the hypothetical firm in our example is 250.³

The IMPLAN model produces several types of reports, but for the purposes of this analysis, we used four reports-employment, wages, output and taxes. Table 2 is an example of the type of employment report produced by IMPLAN with two notable exceptions. First, RESI modified the IMPLAN output by substituting IMPLAN's default salary figures with salaries identified by SAIC (exhibits 7, 14, and 25). These installation-specific figures were inserted into IMPLAN's wage table, replacing the standard wage information. Second, RESI added the estimated 4,000 non-embedded contractor jobs for APG as well as the 4,000 non-embedded contractor jobs for Ft. Meade to the indirect jobs calculated by IMPLAN.

³ Total economic impact is defined as the sum of direct, indirect and induced effects.

5.0 BRAC Timing

RESI assumed that the impacts of BRAC related jobs and household movements would occur in phases. The movements are detailed in the table below.

Table 8: BRAC Job and Household Phase Schedule

Jobs	Phase I: 2006-11	Phase II: 2012-15	Phase III: 2016-20	Total
Direct	100%			100%
Indirect (Non-embedded Contractors)	50%	50%		100%
Indirect (All Others)		100%		100%
Induced		30%	70%	100%

Households	Phase I: 2006-11	Phase II: 2012-15	Total	hhs to Jobs
Direct	30%	70%	100%	0.67
Indirect (Non-embedded Contractors)	15%	85%	100%	0.67
Indirect (All Others)		100%	100%	0.67
Induced		100%	100%	0.67

Phase I-Job Formation: This phase is defined as extending from 2006 through 2011(year-end). During Phase I, we assume that Maryland will absorb 100% of the DOD job creation and 100% of the embedded contractor job creation.⁴ We also expect 50% of the non-embedded contractor jobs to be created during Phase 1.⁵

Phase I-Household Formation: This phase is defined as extending from 2006 through 2011(year-end). We know that some portion of the jobs created by the end of Phase I will be filled by employees who will relocate to Maryland and will thus create new Maryland households. We assume that the ratio of household formation to job formation (for jobs created by 2011) is 3:10 or 30%.⁶ This assumption is based on SAIC’s finding that “30% of the civilian employees from Fort Monmouth will transfer to APG”⁷. This assumption also corresponds to survey results for Fort Meade which suggest that 33 percent of DISA personnel would consider relocating to Maryland.⁸

Phase II-Job Formation: This phase is defined as extending from 2012 through 2015 (year-end). During this phase we expect the remaining 50% of the non-embedded contractor movement to occur. We also expect 100% of the IMPLAN-generated indirect job creation to occur.

⁴ According to RESI, MDP and BMC, these two job categories are considered to be the “direct” jobs generated by BRAC.

⁵ We know that some of the non-embedded contractor movement is already occurring, thus a portion should be included in Phase 1. However, neither data nor estimates exist that indicate the extent to which non-embedded contractor movement is expected to occur. For the purposes of the BRAC analysis, we assume half will occur in Phase 1 and half will occur in Phase II. This is an assumption agreed on by MDP and RESI.

⁶ It should be noted that while we expect the household to jobs ratio to be 3:10 or 30%, not all of these new households are expected to occur in Maryland. Roughly 5 percent are expected to occur outside of Maryland (based on commutation patterns data). The same applies to the 2:3 household to jobs ratio referenced throughout this document.

⁷ SAIC Report, page 2-8.

⁸ SAIC Report, page 6-2.

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Moreover, we expect a portion of the induced job creation to occur (This portion will be in line with household formation expected to occur over the Phase II time frame).

Phase II-Household Formation: This phase is defined as extending from 2012 through 2015 (year-end). This phase has two components. First, we assume that the household growth corresponding to the job formation in Phase 1 (jobs occurring through 2011-year-end) will ramp up. Specifically, by 2015, we assume that the ratio of household formation to job formation (for jobs created by 2011) is 2:3 or 67%.⁹ This figure is based upon the current

The second component of Phase II-household formation is comprised of households associated with job formation from 2012 through 2015. Again, we assume that the ratio of household formation to job formation (for jobs created by 2015) is ultimately 2:3 or 67%. We expect 100% of the total number households associated with Phase II job formation to be created by 2015 year-end.

Phase III – Job Formation: This phase is defined as extending from 2016 through 2020 (year-end). Since induced job impacts are directly tied to household formation, a portion of the induced job formation is expected to occur during this time frame. This portion of induced jobs will follow with the household formation expected to occur between 2012 and 2015.

6.0 Job and Household Allocation Assumptions

RESI used several assumptions to allocate jobs and households across Maryland jurisdictions. For the direct jobs (Civilian DOD and embedded contractor), we assumed that these jobs will be onsite at each installation and thus we assumed that these jobs will be located in the jurisdiction that houses each installation. For the non-embedded contractor jobs, we assumed that those jobs will be proximate to the installation, and again we assumed that these jobs will be distributed based upon a 45 minute commuter shed identified by BMC. For the indirect jobs, we used the most recent county employment forecast from MDP and the existing ES-202 distribution of jobs to allocate the jobs to the counties. For the induced jobs, we determined the distribution of new households and allocated the induced jobs according to this distribution.

The allocation of new households was based on the 2000 Census commutation patterns, the commutation patterns for Fort Meade and adjusted by BMC and MDP based upon housing availability. Furthermore, we assumed that in the first phase of BRAC, 71.2% of the new BRAC employees are homeowners but that in the second phase, homeownership rates among BRAC households would be based upon household income as detailed in table 9.

⁹ This figure is based upon the current (2005) household formation to jobs formation was 63.4%

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Table 9: Homeownership Rates by Income

Household Income	Percentage Homeownership
\$ -	45.54%
1-4,999	44.79%
5,000-9,999	42.31%
10,000-14,999	51.88%
15,000-19,999	53.41%
20,000-24,999	55.45%
25,000-29,999	56.03%
30,000-34,999	60.67%
35,000-39,999	62.59%
40,000-49,999	69.81%
50,000-59,999	74.44%
60,000-79,999	81.18%
80,000-99,999	85.36%
100,000-119,999	89.56%
120,000 or more	92.63%

Source: Housing and Urban Development

We assumed that every three BRAC jobs coming into Maryland would translate into two households living in Maryland. This assumption was made on the basis that some individuals who would be employed by APG or Ft. Meade would commute from Delaware, Pennsylvania or Virginia in higher numbers than what the Census commutation patterns would indicate for job-holders in Maryland who are out-of state residents. Some of the current job holders already reside in Maryland and not every new BRAC household will just have one BRAC related job holder.

7.0 Household Income and Tax Revenues

To estimate the household income of the individuals likely to fill the BRAC jobs, RESI examined Maryland household income data from the Census, IMPLAN and Office of Personnel Management (OPM) data. By using the ratio of the earnings of single income households to the earnings of dual income households, RESI then calculated a weighted average of household income. This average household income figure was the basis for the local and state income taxes. In addition, we used this estimate to determine the value of a home that could be purchased by this household. The resulting home value was used to estimate the local and state property tax revenue that would be generated by this household.

The local and state income taxes were derived from the published income tax rates and average household income.¹⁰ The value of the homes purchased by these new households was based upon a set of assumptions regarding a down payment, other credit obligations and average household income.¹¹ Using the household income data and assuming a 20% down payment, we

¹⁰ In our past experience, 83% of gross household income approximates taxable income.

¹¹ The BRAC jobs are coming to Maryland and there will be some new household formation. However, whether it is individuals from New Jersey, Northern Virginia, or Maryland that fill these jobs, new households will likely be created.

estimated what each household could afford in terms of a house. Based upon the information provided by IMPLAN, we were able to estimate additional state and local tax revenue. These tax revenues include but are not limited to sales tax, fines and forfeitures and licensing fees, among others.

8.0 IMPLAN Model Overview

In order to quantify the economic impact of the BRAC impacts considered in this analysis, RESI utilized the IMPLAN input/output model. This model enumerates the employment and fiscal impact of each dollar earned and spent by the following: employees of the new business, other supporting vendors (business services, retail, etc.), each dollar spent by these vendors on other firms and each dollar spent by the households of the new business' employees, other vendors' employees, and other businesses' employees.

To quantify the economic impact of a new business entering into an area, economists measure three types of economic impacts: direct, indirect, and induced impacts. The direct economic effects are generated as new businesses create jobs and hire workers to fill new positions. The indirect economic impacts occur as new firms purchase goods and services from other firms. In either case the increases in employment generate an increase in household income, as new job opportunities are created and income levels rise. This drives the induced economic impacts that result from households increasing their purchases at local businesses.

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8.1 What is IMPLAN?

IMPLAN is an economic impact assessment software system. The system was originally developed and is now maintained by the Minnesota IMPLAN Group (MIG). It combines a set of extensive databases concerning economic factors, multipliers and demographic statistics with a highly refined and detailed system of modeling software. IMPLAN allows the user to develop local-level input-output models that can estimate the economic impact of new firms moving into an area as well as the impacts of professional sports teams, recreation and tourism, and residential development. The model accomplishes this by identifying direct impacts by sector, then developing a set of indirect and induced impacts by sector through the use of industry-specific multipliers, local purchase coefficients, income-to-output ratios, and other factors and relationships.

¹² Total economic impact is defined as the sum of direct, indirect and induced effects.

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There are two major components to IMPLAN: data files and software. An impact analysis using IMPLAN starts by identifying expenditures in terms of the sectoring scheme for the model. Each spending category becomes a “group” of “events” in IMPLAN, where each event specifies the portion of price allocated to a specific IMPLAN sector. Groups of events can then be used to run impact analysis individually or can be combined into a project consisting of several groups. The overall movement of specific jobs and contractor jobs into Maryland is defined as the direct economic impact. Once the direct economic impacts have been identified, IMPLAN can calculate the indirect and induced impacts based on a set of multipliers and additional factors.

The hallmark of IMPLAN is the specificity of its economic datasets. The database includes information for five-hundred-and-twenty-eight different industries (generally at the four or five digit North American Industrial Classification level), and twenty-one different economic variables. Along with these data files, national input-output structural matrices detail the interrelationships between and among these sectors. The database also contains a full schedule of Social Accounting Matrix (SAM) data. All of this data is available at the national, state, and county level.

Another strength of the IMPLAN system is its flexibility. It allows the user to augment any of the data or algorithmic relationships within each model in order to more precisely account for regional relationships. This includes inputting different output-to-income ratios for a given industry, different wage rates, and different multipliers where appropriate. IMPLAN also provides the user with a choice of trade-flow assumptions, including the modification of regional purchase coefficients, which determine the mix of goods and services purchased locally with each dollar in each sector. Moreover, the system also allows the user to create custom impact analyses by entering changes in final demand. This flexibility is a critically important feature in terms of the RESI proposed approach. RESI is uniquely qualified to develop data and factors tailored to this project, and, where appropriate, overwrite the default data contained in the IMPLAN database.

Another major advantage of IMPLAN is its credibility and acceptance within the profession. There are over five hundred active users of IMPLAN databases and software within the federal and state governments, universities, and among private sector consultants. Figure 1 provides a sampling of IMPLAN users.

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Figure 1: Sampling of IMPLAN Users

<u>Academic Institutions</u>	<u>State Governments</u>
Alabama A&M University	MD Dep't of Natural Resources
Albany State University	Missouri Dep't of Economic Dev.
Auburn University	California Energy Commission
Cornell University	Florida Division of Forestry
Duke University	Illinois Dep't of Natural Resources
Iowa State University	New Mexico Dep't of Tourism
Michigan Tech University	South Carolina Empl Security
Ohio State	Utah Dep't of Natural Resources
Penn State University	Wisconsin Dep't of Transportation
Portland State University	
Purdue University	Private Consulting Firms
Stanford University	
Texas A&M University	Coopers & Lybrand
University of California – Berkeley	Batelle Pacific NW Laboratories
University of Wisconsin	Boise Cascade Corporation
University of Minnesota	Charles River Associates
Virginia Tech	CIC Research
West Virginia University	BTG/Delta Research Division
Marshall University College of Business	Crestar Bank
	Deloitte & Touche
Federal Government	Ernst & Young
	Jack Faucett Associates
Argonne National Lab	KPMG Peat Marwick
Federal Emergency Management Agency (FEMA)	Price Waterhouse LLP
US Dep't of Agriculture, Forest Service	SMS Research
US Dep't of Agriculture, Econ Research Service	Economic Research Associates
US Dep't of Interior, Bureau of Land Mgmt	American Economics Group, Inc.
US Dep't of Interior, Fish and Wildlife Service	L.E. Peabody Associates, Inc.
US Dep't of Interior, National Parks Service	The Kalorama Consulting Group
US Army Corps of Engineers	West Virginia Research League

The paradigmatic centerpiece of an economic impact study is the classification of impacts. The economic impacts of a given event or circumstance (such as new jobs) are classified into three general groups: direct impacts, indirect impacts, and induced impacts. In the case of the BRAC impacts, the direct impacts include the creation of jobs in specific industries and businesses. Indirect impacts measure the positive effect on the economy resulting from businesses selling goods and services to the households. Induced impacts include the effects of increased household spending resulting from direct and indirect effects. Put another way, direct impacts are the immediate impacts of the BRAC Jobs. Indirect and induced impacts are derivative, flowing from direct impacts.

Indirect and induced impacts are estimated by applying multipliers to direct impacts. Multipliers are factors that are applied to a dollar expended toward a particular use. These factors estimate the total value of that dollar as it propagates through the economy. For instance, suppose that a dollar is spent in a certain industry. That dollar will increase the number of jobs in that industry by a certain amount. Furthermore, some of that dollar will go to pay the increased earnings in that industry, resulting in higher personal income. In turn, consumers will spend some share of

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that increase in personal income. The ultimate impact of that dollar initially spent in that certain industry, therefore, is greater than its direct impact on the earnings of that industry. Multipliers are industry-specific factors that estimate the value of a dollar spent in an industry, including not only its direct impacts, but also its indirect and induced impacts.

RESI integrate the IMPLAN model into its methodology for conducting the economic impact analysis of the BRAC Impacts. Specifically, RESI would develop a schedule of direct impacts related the BRAC related job movements. The study team would then create sets of direct impact vectors, which would be input into IMPLAN. The resulting runs would produce indirect and induced impacts related to those direct impact vectors.

The primary advantage of the RESI approach is that it provides geographic and industry detail without sacrificing attention to the individual characteristics BRAC jobs and the state. The geographic and industry detail are provided by the IMPLAN databases, upon which IMPLAN models are constructed. The attention to the unique characteristics and situation of these households are preserved because RESI will develop the direct impact vectors outside of the model, tailoring them to Maryland and the jobs, and utilizing the IMPLAN runs to develop indirect and induced impacts, vis-à-vis those tailored direct impact vectors.

The intimate relationship between the RESI impact model and BRAC's unique situation will be further preserved and enhanced by another aspect of the proposed RESI methodology. To wit, RESI will tailor the operation of the IMPLAN model itself to Maryland and its Counties. Using its extensive knowledge of the Maryland economy, RESI will augment the information contained in the IMPLAN model with detailed assumptions about parameters such as multipliers and output-to-employment ratios.

RESI is uniquely qualified to assess the validity of the multipliers utilized by IMPLAN in terms of their applicability to these BRAC job's contribution to Maryland's economy. RESI is perhaps the leading source of expertise and knowledge concerning the Maryland economy. Through its work on other projects and developing state and county level economic reports, RESI has developed sets of multipliers for the Maryland economy. Economic models (and, for that matter, practically all economic impact studies) rely on broader regional, multi-state multipliers, typically the RIMS II multipliers, produced by the Bureau of Economic Analysis of the Department of Commerce. RESI will examine carefully the regional multipliers used by IMPLAN. RESI will ensure that they are appropriate for use in the methodology. Where necessary, RESI will develop new multipliers that are tailored to Maryland.

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9.0 Detailed Overall Results

The overall economic and fiscal impacts of the BRAC decisions by phase and by county are detailed in the tables below.

Table 10: Summary of BRAC Job Impacts by County and by Phase

County	Direct	Indirect (non-embedded contractors)	Indirect (all others)	Induced	Total
Anne Arundel	5,718	461			6,179
Baltimore		839			839
Cecil		375			375
Harford	9,155	435			9,590
Howard		291			291
Montgomery		250			250
Prince George's	400	250			650
Baltimore City		966			966
Rest of MD		134			134
<i>Phase I</i>	15,273	4,000	-	-	19,273
Anne Arundel		461	1,903	452	2,816
Baltimore		839	1,676	163	2,678
Cecil		375	523	399	1,297
Harford		435	939	524	1,898
Howard		291	1,500	53	1,844
Montgomery		250	3,673	19	3,942
Prince George's		250	2,297	80	2,627
Baltimore City		966	823	117	1,906
Rest of MD		134	1,388	364	1,885
<i>Phase II</i>		4,000	14,722	2,171	20,893
Anne Arundel				1,054	1,054
Baltimore				381	381
Cecil				930	930
Harford				1,224	1,224
Howard				125	125
Montgomery				44	44
Prince George's				186	186
Baltimore City				273	273
Rest of MD				849	849
<i>Phase III</i>				5,066	5,066

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Table 11: Summary of BRAC Job Impacts by NAICS, Phase I

Industrial Sector	Direct	Indirect (non- embedded contractors)	Indirect (all others)	Induced	Total
Agriculture	-	-	-	-	-
Mining	-	-	-	-	-
Utilities	-	-	-	-	-
Construction	-	-	-	-	-
Manufacturing	-	-	-	-	-
Wholesale Trade	-	-	-	-	-
Transportation and Warehousing	1,749	295	-	-	2,044
Retail Trade	-	-	-	-	-
Information	2,727	1,000	-	-	3,727
Finance and Insurance	-	-	-	-	-
Real Estate and Rental and Leasing	-	-	-	-	-
Professional, Scientific and Technical Services	7,421	1,968	-	-	9,389
Management of Companies and Enterprises	1,841	402	-	-	2,243
Administrative and Support and Waste Management and Remediation Services	860	296	-	-	1,156
Educational Services	-	-	-	-	-
Health Care and Social Services	-	-	-	-	-
Arts, Entertainment and Recreation	-	-	-	-	-
Accommodation and Food Services	-	-	-	-	-
Other Services*	675	39	-	-	714
Government	-	-	-	-	-
Total	15,273	4,000	-	-	19,273

* Other Services NAICS classification includes Repair and Maintenance; Personal and Laundry Service; Religious, Grantmaking, Civic, Professional and Similar Organizations; and Private Households.

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Table 12: Summary of BRAC Job Impacts by NAICS, Phase II

Industrial Sector	Direct	Indirect (non- embedded contractors)	Indirect (all others)	Induced	Total
Agriculture	-	-	18	12	30
Mining	-	-	2	1	3
Utilities	-	-	34	6	40
Construction	-	-	309	23	332
Manufacturing	-	-	528	52	580
Wholesale Trade	-	-	248	59	307
Transportation and Warehousing	-	295	1,038	60	1,393
Retail Trade	-	-	279	398	677
Information	-	1,000	1,822	25	2,847
Finance and Insurance	-	-	419	95	514
Real Estate and Rental and Leasing	-	-	933	71	1,004
Professional, Scientific and Technical Services	-	1,968	3,759	103	5,830
Management of Companies and Enterprises	-	402	82	7	491
Administrative and Support and Waste Management and Remediation Services	-	296	3,470	97	3,863
Educational Services	-	-	48	80	128
Health Care and Social Services	-	-	1	432	433
Arts, Entertainment and Recreation	-	-	441	70	511
Accommodation and Food Services	-	-	676	261	937
Other Services*	-	39	534	180	753
Government	-	-	81	140	221
Total	-	4,000	14,722	2,171	20,893

* Other Services NAICS classification includes Repair and Maintenance; Personal and Laundry Service; Religious, Grantmaking, Civic, Professional and Similar Organizations; and Private Households.

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Table 13: Summary of BRAC Job Impacts by NAICS, Phase III

Industrial Sector	Direct	Indirect (non- embedded contractors)	Indirect (all others)	Induced	Total
Agriculture	-	-	-	27	27
Mining	-	-	-	2	2
Utilities	-	-	-	14	14
Construction	-	-	-	54	54
Manufacturing	-	-	-	122	122
Wholesale Trade	-	-	-	138	138
Transportation and Warehousing	-	-	-	140	140
Retail Trade	-	-	-	929	929
Information	-	-	-	57	57
Finance and Insurance	-	-	-	223	223
Real Estate and Rental and Leasing	-	-	-	165	165
Professional, Scientific and Technical Services	-	-	-	239	239
Management of Companies and Enterprises	-	-	-	17	17
Administrative and Support and Waste Management and Remediation Services	-	-	-	227	227
Educational Services	-	-	-	187	187
Health Care and Social Services	-	-	-	1,008	1,008
Arts, Entertainment and Recreation	-	-	-	164	164
Accommodation and Food Services	-	-	-	608	608
Other Services*	-	-	-	419	419
Government	-	-	-	326	326
Total	-	-	-	5,066	5,066

* Other Services NAICS classification includes Repair and Maintenance; Personal and Laundry Service; Religious, Grantmaking, Civic, Professional and Similar Organizations; and Private Households.

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Table 14: Summary of BRAC Household Movements by Phase

County	Direct	Indirect (Non- Embedded Contractors)	Indirect	Induced	Total
Anne Arundel	620	94	-	-	714
Baltimore	226	183	-	-	410
Cecil	248	76	-	-	324
Harford	1,239	89	-	-	1,328
Howard	195	49	-	-	244
Montgomery	39	43	-	-	83
Prince George's	118	42	-	-	159
Baltimore City	106	159	-	-	264
Rest of MD	92	54	-	-	146
Phase I	2,886	792	-	-	3,672
Anne Arundel	1,424	488	1,142	689	3,743
Baltimore	523	1,031	1,178	511	3,243
Cecil	224	317	332	800	1,673
Harford	3,158	505	607	936	5,205
Howard	455	276	725	154	1,609
Montgomery	92	245	1,777	78	2,191
Prince George's	271	235	1,169	161	1,837
Baltimore City	260	899	777	349	2,284
Rest of MD	219	321	1,354	824	2,718
Phase II	6,625	4,319	9,061	4,501	24,504

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Table 15: Summary of BRAC Tax Revenue Impacts by phases

County	Local		State			Total
	Property Taxes	Income Taxes	Property taxes	Income taxes	Other State and Local taxes	
Anne Arundel	\$ 3,265,964	\$ 2,416,330	\$ 456,411	\$ 4,247,454	\$ 3,550,015	\$ 13,936,174
Baltimore	\$ 2,320,527	\$ 1,607,661	\$ 274,717	\$ 2,556,351	\$ 2,136,594	\$ 8,895,850
Cecil	\$ 1,762,954	\$ 1,217,439	\$ 210,253	\$ 1,956,598	\$ 1,635,321	\$ 6,782,563
Harford	\$ 7,317,341	\$ 5,316,918	\$ 839,165	\$ 7,818,997	\$ 6,535,104	\$ 27,827,524
Howard	\$ 1,245,166	\$ 1,041,843	\$ 157,435	\$ 1,465,092	\$ 1,224,521	\$ 5,134,057
Montgomery	\$ 307,706	\$ 370,660	\$ 56,016	\$ 521,241	\$ 435,653	\$ 1,691,276
Prince George's	\$ 839,673	\$ 686,701	\$ 103,770	\$ 965,673	\$ 807,108	\$ 3,402,925
Baltimore City	\$ 3,148,671	\$ 1,142,091	\$ 180,080	\$ 1,685,052	\$ 1,408,363	\$ 7,564,257
Rest of MD	\$ 843,804	\$ 591,357	\$ 100,796	\$ 937,968	\$ 783,952	\$ 3,257,877
Phase I	\$ 21,051,805	\$14,390,999	\$ 2,378,643	\$ 22,154,426	\$ 18,516,630	\$ 78,492,503
Anne Arundel	\$ 15,215,518	\$ 9,246,371	\$ 2,126,333	\$ 16,253,387	\$ 13,584,552	\$ 56,426,162
Baltimore	\$ 15,970,958	\$ 9,084,364	\$ 1,890,732	\$ 14,445,101	\$ 12,073,190	\$ 53,464,346
Cecil	\$ 6,430,471	\$ 3,729,937	\$ 766,908	\$ 5,994,542	\$ 5,010,227	\$ 21,932,085
Harford	\$ 29,560,132	\$17,246,082	\$ 3,390,006	\$ 25,361,885	\$ 21,197,419	\$ 96,755,524
Howard	\$ 7,122,984	\$ 4,934,569	\$ 900,607	\$ 6,939,238	\$ 5,799,803	\$ 25,697,201
Montgomery	\$ 5,076,432	\$ 5,382,125	\$ 924,135	\$ 7,568,613	\$ 6,325,833	\$ 25,277,138
Prince George's	\$ 7,029,202	\$ 4,918,439	\$ 868,699	\$ 6,916,554	\$ 5,780,844	\$ 25,513,738
Baltimore City	\$ 24,240,917	\$ 7,135,110	\$ 1,386,396	\$ 10,527,211	\$ 8,798,625	\$ 52,088,259
Rest of MD	\$ 9,327,068	\$ 5,692,119	\$ 1,114,161	\$ 9,028,420	\$ 7,545,937	\$ 32,707,707
Phase II	\$119,973,683	\$67,369,116	\$13,367,977	\$103,034,952	\$ 86,116,430	\$389,862,159

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Table 16: Employment by BRAC movement

	Direct	Indirect (Non- Embedded Contractors)	Indirect	Induced	Total
Aberdeen Proving Ground					
Anne Arundel		-	981	912	1,892
Baltimore		1,245	863	329	2,438
Cecil		750	269	804	1,824
Harford	9,156	870	484	1,058	11,567
Howard		-	773	108	881
Montgomery		-	1,893	38	1,931
Prince George's		-	1,184	144	1,328
Baltimore City		885	424	236	1,545
Rest of MD		250	715	750	1,716
Total	9,156	4,000	7,586	4,379	25,121
Andrews Airforce Base					
Anne Arundel			43	39	82
Baltimore			38	14	52
Cecil			12	34	46
Harford			21	45	66
Howard			34	5	38
Montgomery			83	2	84
Prince George's	400		52	6	458
Baltimore City			19	10	29
Rest of MD			31	32	63
Total	400	-	331	187	919
Fort Meade					
Anne Arundel	5,718	922	880	556	8,076
Baltimore		433	775	201	1,408
Cecil		-	242	490	732
Harford		-	434	645	1,079
Howard		581	693	66	1,340
Montgomery		500	1,698	23	2,221
Prince George's		500	1,062	88	1,650
Baltimore City		1,047	380	144	1,571
Rest of MD		17	642	458	1,116
Total	5,718	4,000	6,805	2,671	19,194

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Table 17: Households by BRAC movement

	Direct	Indirect (Non- Embedded Contractors)	Indirect	Induced	Total
Aberdeen Proving Ground					
Anne Arundel	61	88	608	428	1,185
Baltimore	488	704	600	302	2,094
Cecil	461	497	153	467	1,578
Harford	4,279	530	313	565	5,686
Howard	21	55	373	92	542
Montgomery	9	13	916	46	983
Prince George's	9	18	603	92	721
Baltimore City	188	528	408	214	1,339
Rest of MD	55	214	698	506	1,474
Total	5,570	2,648	4,672	2,713	15,603
Andrews Airforce Base					
Anne Arundel	25	-	27	18	69
Baltimore	4	-	27	13	44
Cecil	0	-	6	18	24
Harford	1	-	15	26	41
Howard	13	-	16	4	33
Montgomery	24	-	40	2	66
Prince George's	141	-	26	4	171
Baltimore City	3	-	12	8	24
Rest of MD	27	-	33	24	83
Total	238	-	202	116	557
Fort Meade					
Anne Arundel	1,942	502	508	251	3,203
Baltimore	257	511	553	193	1,514
Cecil	2	2	143	247	394
Harford	46	77	293	360	777
Howard	617	269	335	56	1,278
Montgomery	100	275	821	28	1,225
Prince George's	240	268	541	56	1,105
Baltimore City	172	526	355	131	1,184
Rest of MD	234	167	627	309	1,337
Total	3,611	2,598	4,176	1,631	12,016

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Table 18: Direct Jobs by NAICS and by County

NAICS Sectors	Anne Arundel	Baltimore	Cecil	Harford	Howard	Montgomery	Prince George's	Baltimore City	Rest of MD	Total
Agriculture	-	-	-	-	-	-	-	-	-	-
Mining	-	-	-	-	-	-	-	-	-	-
Utilities	-	-	-	-	-	-	-	-	-	-
Construction	-	-	-	-	-	-	-	-	-	-
Manufacturing	-	-	-	-	-	-	-	-	-	-
Wholesale Trade	-	-	-	-	-	-	-	-	-	-
Transportation and Warehousing	-	-	-	1,349	-	-	400	-	-	1,749
Retail Trade	-	-	-	-	-	-	-	-	-	-
Information	2,718	-	-	-	-	-	-	-	-	2,718
Finance and Insurance	-	-	-	-	-	-	-	-	-	-
Real Estate and Rental and Leasing	-	-	-	-	-	-	-	-	-	-
Professional, Scientific and Technical Services	3,000	-	-	4,430	-	-	-	-	-	7,430
Management of Companies and Enterprises	-	-	-	1,841	-	-	-	-	-	1,841
Administrative and Support and Waste Management and Remediation Services	-	-	-	860	-	-	-	-	-	860
Educational Services	-	-	-	-	-	-	-	-	-	-
Health Care and Social Services	-	-	-	-	-	-	-	-	-	-
Arts, Entertainment and Recreation	-	-	-	-	-	-	-	-	-	-
Accommodation and Food Services	-	-	-	-	-	-	-	-	-	-
Other Services	-	-	-	675	-	-	-	-	-	675
Government	-	-	-	-	-	-	-	-	-	-
Total	5,718	-	-	9,155	-	-	400	-	-	15,273

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Table 19: Indirect (non-embedded contractor) Jobs by NAICS and by County

NAICS Sectors	Anne Arundel	Baltimore	Cecil	Harford	Howard	Montgomery	Prince George's	Baltimore City	Rest of MD	Total
Agriculture	-	-	-	-	-	-	-	-	-	-
Mining	-	-	-	-	-	-	-	-	-	-
Utilities	-	-	-	-	-	-	-	-	-	-
Construction	-	-	-	-	-	-	-	-	-	-
Manufacturing	-	-	-	-	-	-	-	-	-	-
Wholesale Trade	-	-	-	-	-	-	-	-	-	-
Transportation and Warehousing	-	184	111	128	-	-	-	131	37	590
Retail Trade	-	-	-	-	-	-	-	-	-	-
Information	461	217	-	-	291	250	250	524	9	2,000
Finance and Insurance	-	-	-	-	-	-	-	-	-	-
Real Estate and Rental and Leasing	-	-	-	-	-	-	-	-	-	-
Professional, Scientific and Technical Services	461	819	363	421	291	250	250	952	130	3,936
Management of Companies and Enterprises	-	250	151	175	-	-	-	178	50	804
Administrative and Support and Waste Management and Remediation Services	-	184	111	129	-	-	-	131	37	592
Educational Services	-	-	-	-	-	-	-	-	-	-
Health Care and Social Services	-	-	-	-	-	-	-	-	-	-
Arts, Entertainment and Recreation	-	-	-	-	-	-	-	-	-	-
Accommodation and Food Services	-	-	-	-	-	-	-	-	-	-
Other Services	-	24	15	17	-	-	-	17	5	78
Government	-	-	-	-	-	-	-	-	-	-
Total	922	1,678	750	870	581	500	500	1,932	267	8,000

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Table 20: Indirect Jobs by NAICS and by County

NAICS Sectors	Anne Arundel	Baltimore	Cecil	Harford	Howard	Montgomery	Prince George's	Baltimore City	Rest of MD	Total
Agriculture	2	2	1	1	2	5	3	1	2	18
Mining	0	0	0	0	0	0	0	0	0	2
Utilities	4	4	1	2	3	8	5	2	3	34
Construction	40	35	11	20	32	77	48	17	29	309
Manufacturing	68	60	19	34	54	132	82	30	50	528
Wholesale Trade	32	28	9	16	25	62	39	14	23	248
Transportation and Warehousing	134	118	37	66	106	259	162	58	98	1,038
Retail Trade	36	32	10	18	28	70	44	16	26	279
Information	235	207	65	116	186	455	284	102	172	1,822
Finance and Insurance	54	48	15	27	43	105	65	23	40	419
Real Estate and Rental and Leasing	121	106	33	59	95	233	146	52	88	933
Professional, Scientific and Technical Services	486	428	134	240	383	938	587	210	354	3,759
Management of Companies and Enterprises	11	9	3	5	8	20	13	5	8	82
Administrative and Support and Waste Management and Remediation Services	448	395	123	221	354	866	541	194	327	3,469
Educational Services	6	5	2	3	5	12	8	3	5	48
Health Care and Social Services	0	0	0	0	0	0	0	0	0	1
Arts, Entertainment and Recreation	57	50	16	28	45	110	69	25	42	441
Accommodation and Food Services	87	77	24	43	69	169	105	38	64	676
Other Services	69	61	19	34	54	133	83	30	50	534
Government	11	9	3	5	8	20	13	5	8	81
Total	1,903	1,676	523	939	1,500	3,673	2,297	823	1,388	14,722

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Table 21: Induced Jobs by NAICS and by County

NAICS Sectors	Anne Arundel	Baltimore	Cecil	Harford	Howard	Montgomery	Prince George's	Baltimore City	Rest of MD	Total
Agriculture	8	3	7	9	1	0	1	2	7	39
Mining	1	0	1	1	0	0	0	0	1	3
Utilities	4	1	4	5	0	0	1	1	3	20
Construction	16	6	14	19	2	1	3	4	13	77
Manufacturing	36	13	32	42	4	2	6	9	30	174
Wholesale Trade	41	15	36	48	5	2	6	11	34	197
Transportation and Warehousing	42	15	37	48	5	2	7	11	34	200
Retail Trade	276	100	244	320	33	12	44	72	227	1,327
Information	17	6	15	20	2	1	3	4	14	82
Finance and Insurance	66	24	58	77	8	3	10	17	55	318
Real Estate and Rental and Leasing	49	18	43	57	6	2	8	13	40	235
Professional, Scientific and Technical Services	71	26	63	83	8	3	11	18	59	342
Management of Companies and Enterprises	5	2	4	6	1	0	1	1	4	24
Administrative and Support and Waste Management and Remediation Services	67	24	60	78	8	3	11	17	56	324
Educational Services	56	20	49	65	7	2	9	14	46	267
Health Care and Social Services	300	108	264	348	35	13	47	78	247	1,440
Arts, Entertainment and Recreation	49	18	43	57	6	2	8	13	40	234
Accommodation and Food Services	181	65	160	210	21	8	29	47	149	869
Other Services	125	45	110	145	15	5	20	32	103	599
Government	97	35	86	112	11	4	15	25	80	466
Total	1,506	544	1,329	1,748	178	63	239	390	1,240	7,237

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Table 22: Aberdeen Proving Ground Direct Jobs by NAICS and by County

NAICS Sectors	Anne Arundel	Baltimore	Cecil	Harford	Howard	Montgomery	Prince George's	Baltimore City	Rest of MD	Total
Agriculture				-						
Mining				-						
Utilities				-						
Construction				-						
Manufacturing				-						
Wholesale Trade				-						
Transportation and Warehousing				1,350						
Retail Trade				-						
Information				-						
Finance and Insurance				-						
Real Estate and Rental and Leasing				-						
Professional, Scientific and Technical Services				4,430						
Management of Companies and Enterprises				1,841						
Administrative and Support and Waste Management and Remediation Services				860						
Educational Services				-						
Health Care and Social Services				-						
Arts, Entertainment and Recreation				-						
Accommodation and Food Services				-						
Other Services				675						
Government				-						
Total				9,156						

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Table 23: Aberdeen Proving Ground Indirect (non-embedded contractor) jobs by NAICS and by County

NAICS Sectors	Anne Arundel	Baltimore	Cecil	Harford	Howard	Montgomery	Prince George's	Baltimore City	Rest of MD	Total
Agriculture	-	-	-	-	-	-	-	-	-	-
Mining	-	-	-	-	-	-	-	-	-	-
Utilities	-	-	-	-	-	-	-	-	-	-
Construction	-	-	-	-	-	-	-	-	-	-
Manufacturing	-	-	-	-	-	-	-	-	-	-
Wholesale Trade	-	-	-	-	-	-	-	-	-	-
Transportation and Warehousing	-	184	111	128	-	-	-	131	37	590
Retail Trade	-	-	-	-	-	-	-	-	-	-
Information	-	-	-	-	-	-	-	-	-	-
Finance and Insurance	-	-	-	-	-	-	-	-	-	-
Real Estate and Rental and Leasing	-	-	-	-	-	-	-	-	-	-
Professional, Scientific and Technical Services	-	603	363	421	-	-	-	428	121	1,936
Management of Companies and Enterprises	-	250	151	175	-	-	-	178	50	804
Administrative and Support and Waste Management and Remediation Services	-	184	111	129	-	-	-	131	37	592
Educational Services	-	-	-	-	-	-	-	-	-	-
Health Care and Social Services	-	-	-	-	-	-	-	-	-	-
Arts, Entertainment and Recreation	-	-	-	-	-	-	-	-	-	-
Accommodation and Food Services	-	-	-	-	-	-	-	-	-	-
Other Services	-	24	15	17	-	-	-	17	5	78
Government	-	-	-	-	-	-	-	-	-	-
Total	-	1,245	750	870	-	-	-	885	250	4,000

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Table 24: Aberdeen Proving Ground Indirect Jobs by NAICS and by County

NAICS Sectors	Anne Arundel	Baltimore	Cecil	Harford	Howard	Montgomery	Prince George's	Baltimore City	Rest of MD	Total
Agriculture	2	1	0	1	1	3	2	1	1	13
Mining	0	0	0	0	0	0	0	0	0	1
Utilities	3	3	1	2	3	6	4	1	2	25
Construction	30	26	8	15	23	57	36	13	22	228
Manufacturing	39	34	11	19	31	75	47	17	28	302
Wholesale Trade	18	16	5	9	14	35	22	8	13	142
Transportation and Warehousing	81	71	22	40	64	156	98	35	59	626
Retail Trade	24	21	7	12	19	47	29	11	18	188
Information	47	41	13	23	37	90	57	20	34	362
Finance and Insurance	31	28	9	15	25	61	38	14	23	243
Real Estate and Rental and Leasing	80	70	22	39	63	153	96	34	58	615
Professional, Scientific and Technical Services	220	194	61	109	174	426	266	95	161	1,706
Management of Companies and Enterprises	6	5	2	3	5	12	7	3	4	47
Administrative and Support and Waste Management and Remediation Services	275	242	76	136	217	531	332	119	201	2,129
Educational Services	2	2	1	1	2	4	2	1	1	15
Health Care and Social Services	0	0	0	0	0	0	0	0	0	1
Arts, Entertainment and Recreation	21	18	6	10	16	40	25	9	15	159
Accommodation and Food Services	51	45	14	25	41	99	62	22	38	398
Other Services	43	38	12	21	34	83	52	19	31	332
Government	7	6	2	3	5	13	8	3	5	51
Total	981	863	269	484	773	1,893	1,184	424	715	7,586

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Table 25: Aberdeen Proving Ground Induced Jobs by NAICS and by County

NAICS Sectors	Anne Arundel	Baltimore	Cecil	Harford	Howard	Montgomery	Prince George's	Baltimore City	Rest of MD	Total
Agriculture	5	2	4	6	1	0	1	1	4	24
Mining	0	0	0	0	0	0	0	0	0	1
Utilities	2	1	2	3	0	0	0	1	2	12
Construction	9	3	8	11	1	0	1	2	7	44
Manufacturing	22	8	19	26	3	1	3	6	18	106
Wholesale Trade	25	9	22	29	3	1	4	6	21	120
Transportation and Warehousing	25	9	22	29	3	1	4	6	21	120
Retail Trade	170	61	150	197	20	7	27	44	140	814
Information	10	4	9	12	1	0	2	3	9	50
Finance and Insurance	40	15	36	47	5	2	6	10	33	195
Real Estate and Rental and Leasing	30	11	26	34	4	1	5	8	24	143
Professional, Scientific and Technical Services	42	15	37	49	5	2	7	11	35	203
Management of Companies and Enterprises	3	1	3	4	0	0	0	1	3	15
Administrative and Support and Waste Management and Remediation Services	40	15	36	47	5	2	6	10	33	195
Educational Services	34	12	30	40	4	1	5	9	28	164
Health Care and Social Services	184	66	162	214	22	8	29	48	152	884
Arts, Entertainment and Recreation	30	11	26	35	4	1	5	8	25	143
Accommodation and Food Services	111	40	98	129	13	5	18	29	91	533
Other Services	76	28	67	89	9	3	12	20	63	367
Government	51	19	45	60	6	2	8	13	42	247
Total	912	329	804	1,058	108	38	144	236	750	4,379

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Table 26: Andrews Airforce Base Direct Jobs by NAICS and by County

NAICS Sectors	Anne Arundel	Baltimore	Cecil	Harford	Howard	Montgomery	Prince George's	Baltimore City	Rest of MD	Total
Agriculture							-			
Mining							-			
Utilities							-			
Construction							-			
Manufacturing							-			
Wholesale Trade							-			
Transportation and Warehousing							400			400
Retail Trade							-			
Information							-			
Finance and Insurance							-			
Real Estate and Rental and Leasing							-			
Professional, Scientific and Technical Services							-			
Management of Companies and Enterprises							-			
Administrative and Support and Waste Management and Remediation Services							-			
Educational Services							-			
Health Care and Social Services							-			
Arts, Entertainment and Recreation							-			
Accommodation and Food Services							-			
Other Services							-			
Government							-			
Total							400			400

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Table 27: Andrews Airforce Base Indirect jobs by NAICS and by County

NAICS Sectors	Anne Arundel	Baltimore	Cecil	Harford	Howard	Montgomery	Prince George's	Baltimore City	Rest of MD	Total
Agriculture	-	-	-	-	-	-	-	-	-	-
Mining	-	-	-	-	-	-	-	-	-	-
Utilities	0	0	0	0	0	0	0	0	0	1
Construction	1	1	0	0	1	2	1	0	1	7
Manufacturing	1	1	0	0	1	2	1	0	1	7
Wholesale Trade	1	1	0	0	1	2	1	0	1	7
Transportation and Warehousing	10	9	3	5	8	20	12	4	7	79
Retail Trade	1	1	0	0	1	2	1	0	1	8
Information	2	2	1	1	2	4	2	1	1	15
Finance and Insurance	1	1	0	1	1	3	2	1	1	10
Real Estate and Rental and Leasing	3	3	1	2	2	6	4	1	2	24
Professional, Scientific and Technical Services	13	12	4	6	10	25	16	6	10	101
Management of Companies and Enterprises	0	0	0	0	0	0	0	0	0	1
Administrative and Support and Waste Management and Remediation Services	5	4	1	2	4	10	6	2	4	39
Educational Services	0	0	0	0	0	1	1	0	0	4
Health Care and Social Services	-	-	-	-	-	-	-	-	-	-
Arts, Entertainment and Recreation	0	0	0	0	0	1	0	0	0	3
Accommodation and Food Services	1	1	0	1	1	2	1	1	1	9
Other Services	2	2	0	1	1	3	2	1	1	13
Government	1	1	0	0	0	1	1	0	0	5
Total	43	38	12	21	34	83	52	19	31	331

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Table 28: Andrews Airforce Base Induced Jobs by NAICS and by County

NAICS Sectors	Anne Arundel	Baltimore	Cecil	Harford	Howard	Montgomery	Prince George's	Baltimore City	Rest of MD	Total
Agriculture	0	0	0	0	0	0	0	0	0	1
Mining	0	0	0	0	0	0	0	0	0	0
Utilities	0	0	0	0	0	0	0	0	0	1
Construction	1	0	1	1	0	0	0	0	0	3
Manufacturing	1	0	1	1	0	0	0	0	1	4
Wholesale Trade	1	0	1	1	0	0	0	0	1	5
Transportation and Warehousing	1	0	1	1	0	0	0	0	1	5
Retail Trade	7	2	6	8	1	0	1	2	5	31
Information	0	0	0	0	0	0	0	0	0	2
Finance and Insurance	2	1	1	2	0	0	0	0	1	8
Real Estate and Rental and Leasing	1	0	1	1	0	0	0	0	1	6
Professional, Scientific and Technical Services	2	1	2	2	0	0	0	1	2	10
Management of Companies and Enterprises	0	0	0	0	0	0	0	0	0	1
Administrative and Support and Waste Management and Remediation Services	2	1	2	2	0	0	0	0	2	9
Educational Services	1	0	1	2	0	0	0	0	1	6
Health Care and Social Services	7	3	6	8	1	0	1	2	6	34
Arts, Entertainment and Recreation	1	0	1	1	0	0	0	0	1	6
Accommodation and Food Services	4	2	4	5	1	0	1	1	4	21
Other Services	3	1	3	3	0	0	0	1	2	14
Government	4	2	4	5	1	0	1	1	4	21
Total	39	14	34	45	5	2	6	10	32	187

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Table 29: Fort Meade Direct Jobs by NAICS and by County

NAICS Sectors	Anne Arundel	Baltimore	Cecil	Harford	Howard	Montgomery	Prince George's	Baltimore City	Rest of MD	Total
Agriculture	-									
Mining	-									
Utilities	-									
Construction	-									
Manufacturing	-									
Wholesale Trade	-									
Transportation and Warehousing	-									
Retail Trade	-									
Information	2,718									2,718
Finance and Insurance	-									
Real Estate and Rental and Leasing	-									
Professional, Scientific and Technical Services	3,000									3,000
Management of Companies and Enterprises	-									
Administrative and Support and Waste Management and Remediation Services	-									
Educational Services	-									
Health Care and Social Services	-									
Arts, Entertainment and Recreation	-									
Accommodation and Food Services	-									
Other Services	-									
Government	-									
Total	5,718									5,718

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Table 30: Fort Meade Indirect (non-embedded contractor) jobs by NAICS and by County

NAICS Sectors	Anne Arundel	Baltimore	Cecil	Harford	Howard	Montgomery	Prince George's	Baltimore City	Rest of MD	Total
Agriculture	-	-	-	-	-	-	-	-	-	-
Mining	-	-	-	-	-	-	-	-	-	-
Utilities	-	-	-	-	-	-	-	-	-	-
Construction	-	-	-	-	-	-	-	-	-	-
Manufacturing	-	-	-	-	-	-	-	-	-	-
Wholesale Trade	-	-	-	-	-	-	-	-	-	-
Transportation and Warehousing	-	-	-	-	-	-	-	-	-	-
Retail Trade	-	-	-	-	-	-	-	-	-	-
Information	461	217	-	-	291	250	250	524	9	2,000
Finance and Insurance	-	-	-	-	-	-	-	-	-	-
Real Estate and Rental and Leasing	-	-	-	-	-	-	-	-	-	-
Professional, Scientific and Technical Services	461	217	-	-	291	250	250	524	8	2,000
Management of Companies and Enterprises	-	-	-	-	-	-	-	-	-	-
Administrative and Support and Waste Management and Remediation Services	-	-	-	-	-	-	-	-	-	-
Educational Services	-	-	-	-	-	-	-	-	-	-
Health Care and Social Services	-	-	-	-	-	-	-	-	-	-
Arts, Entertainment and Recreation	-	-	-	-	-	-	-	-	-	-
Accommodation and Food Services	-	-	-	-	-	-	-	-	-	-
Other Services	-	-	-	-	-	-	-	-	-	-
Government	-	-	-	-	-	-	-	-	-	-
Total	922	433	-	-	581	500	500	1,047	17	4,000

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Table 31: Fort Meade Indirect Jobs by NAICS and by County

NAICS Sectors	Anne Arundel	Baltimore	Cecil	Harford	Howard	Montgomery	Prince George's	Baltimore City	Rest of MD	Total
Agriculture	1	1	0	0	1	1	1	0	0	5
Mining	0	0	0	0	0	0	0	0	0	1
Utilities	1	1	0	1	1	2	1	0	1	8
Construction	10	8	3	5	8	19	12	4	7	74
Manufacturing	28	25	8	14	22	55	34	12	21	219
Wholesale Trade	13	11	4	6	10	25	16	6	9	100
Transportation and Warehousing	43	38	12	21	34	83	52	19	31	333
Retail Trade	11	9	3	5	8	21	13	5	8	83
Information	187	164	51	92	147	360	225	81	136	1,444
Finance and Insurance	21	19	6	11	17	41	26	9	16	166
Real Estate and Rental and Leasing	38	34	10	19	30	73	46	16	28	294
Professional, Scientific and Technical Services	252	222	69	124	199	487	305	109	184	1,952
Management of Companies and Enterprises	4	4	1	2	3	8	5	2	3	34
Administrative and Support and Waste Management and Remediation Services	168	148	46	83	133	325	203	73	123	1,301
Educational Services	4	3	1	2	3	7	5	2	3	29
Health Care and Social Services	0	0	0	0	0	0	0	0	0	0
Arts, Entertainment and Recreation	36	32	10	18	28	70	43	16	26	279
Accommodation and Food Services	35	31	10	17	27	67	42	15	25	268
Other Services	24	21	7	12	19	47	29	11	18	189
Government	3	3	1	2	3	6	4	1	2	25
Total	880	775	242	434	693	1,698	1,062	380	642	6,805

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Table 32: Fort Meade Induced Jobs by NAICS and by County

NAICS Sectors	Anne Arundel	Baltimore	Cecil	Harford	Howard	Montgomery	Prince George's	Baltimore City	Rest of MD	Total
Agriculture	3	1	3	3	0	0	0	1	2	14
Mining	0	0	0	1	0	0	0	0	0	2
Utilities	2	1	1	2	0	0	0	0	1	7
Construction	6	2	6	7	1	0	1	2	5	30
Manufacturing	13	5	12	16	2	1	2	3	11	65
Wholesale Trade	15	5	13	17	2	1	2	4	12	72
Transportation and Warehousing	15	6	14	18	2	1	2	4	13	74
Retail Trade	100	36	88	116	12	4	16	26	82	481
Information	6	2	6	7	1	0	1	2	5	30
Finance and Insurance	24	9	21	28	3	1	4	6	20	116
Real Estate and Rental and Leasing	18	7	16	21	2	1	3	5	15	87
Professional, Scientific and Technical Services	27	10	24	31	3	1	4	7	22	129
Management of Companies and Enterprises	2	1	2	2	0	0	0	0	2	9
Administrative and Support and Waste Management and Remediation Services	25	9	22	29	3	1	4	7	21	121
Educational Services	20	7	18	23	2	1	3	5	17	97
Health Care and Social Services	109	39	96	126	13	5	17	28	89	522
Arts, Entertainment and Recreation	18	6	16	20	2	1	3	5	15	85
Accommodation and Food Services	66	24	58	76	8	3	10	17	54	315
Other Services	45	16	40	53	5	2	7	12	37	218
Government	41	15	36	48	5	2	7	11	34	197
Total	556	201	490	645	66	23	88	144	458	2,671