The Economic Impact of Fort Lee on the Petersburg Region

Research and Technical Assistance Project

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Every year, Fort Lee channels billions of dollars of Federal Spending into the Petersburg Area and the surrounding region. Defense spending of this volume impacts the region in ways that will often be difficult to measure. Accordingly, this report provides a comprehensive picture of the ways in which spending at Fort Lee impacts both the overall size of the Petersburg-area, as well as the economy's structure and composition – specifically, the region's distinctive skew of employment and spending towards activities tied to Fort Lee.

To make these estimates, we rely on economic impact analysis. Economic impact models provide detailed information on the flows of economic activity between industries and counties. As a result, economic impact analysis allows us to trace the ways in which spending ripples through a local economy. It is especially useful for cases of federal contracting and procurement such as this one. Using the detailed economic impact model from the Minnesota Implan Group (MIG), we were able to trace spending at Fort Lee as it flowed from the Department of Defense to contractors, subcontractors and the goods and services they purchased; to military and civilian employees and their families; and to the subdivisions, retailers and service providers where Fort Lee employees and workers at defense contractors spent their hard-earned paychecks.

Based on data provided by Fort Lee, we estimate the total annual impact of Fort Lee at 28,000 jobs and $2.4 billion in economic output – approximately 13.62% of the total 2008 Gross Domestic Product (GDP) for the three-county and three-city region surrounding Fort Lee.[1]

Table 1: Total Economic Impact of Fort Lee on the Petersburg Region

Figures denote total value of goods and services produced as a result of Fort Lee activity

	Procurement	Fort Lee Personnel	Procurement + Personnel
Direct Impact: Federal spending on Fort Lee personnel and contracts; impact of spending and employment by spouses of Fort Lee personnel	83,450,527	1,457,399,754	1,540,850,281
Indirect Impact: Contractors' spending on materials, services and subcontracts	17,965,573	141,140,498	159,106,070
Induced Impact: Economic activity generated as employees of Fort Lee and its contractors spend their income	26,554,503	674,276,376	700,830,878
Total Impact:	127,970,603	2,272,816,628	2,400,787,230

[1] All figures in this report are inflation-adjusted to 2011. Following the Fort Lee Growth Management Plan, the region surrounding Fort Lee is defined as Chesterfield County, the City of Colonial Heights, Hopewell City, Dinwiddie County, Petersburg City and Prince George County.

Table 1 shows the cumulative economic impact of the main economic 'levers' at Fort Lee: procurement of goods and services, and pay to military personnel, Department of Defense civilians and on-post contractors.[2]

- ***Direct Impact*** denotes the dollar value of spending steered into the local economy from the outside. For contracting and procurement, this is the dollar value of the contracts exacted through Fort Lee. For personnel, this figure marks the total estimated value of employee compensation.

- ***Indirect Impact*** denotes the subsequent growth in economic activity at local firms that supply goods and services necessary to the day-to-day operation of Fort Lee. We estimate that the $83 million in local contracts for garrison support, construction, and mission support generates an additional $17 million of economic activity through these purchases. Please note that our estimates here are confined to maintenance, repairs, electricity generation and other services necessary to operating Fort Lee. We were not able to include the value of computer, aerospace, manufacturing and other contracts let *through* Fort Lee.

- ***Induced Impact*** denotes the business activity that occurs when Fort Lee personnel and employees of firms supplying goods to the post spend their paychecks. While direct and indirect impacts vary based on the types of goods and services being produced, induced impacts typically vary much less. Regardless of total pay levels, workers spend their income on the same bundle of goods: housing, transportation, consumer purchases, education, entertainment, etc. Fort Lee personnel are numerous and generally well compensated. The $674 million they generate in induced economic activity in the region exceeds the induced impact from employees of off-post contractors.

Table 2: Economic Impact Multipliers

Type of Impact	Military Personnel	DoD Civilians	Mission Support Contracting	Students	Garrison Support Contracting	Average
Employment	1.41	1.30	1.30	1.29	1.46	1.35
Income	1.26	1.25	1.25	1.53	1.45	1.27
Output	1.51	1.62	1.62	1.57	1.53	1.55

One way to effectively compare the relative economic importance of different components of post activities to the region is to look at economic impact multipliers. A multiplier summarizes the total impact that can be expected from change in a given economic activity. For example, a new manufacturing facility or an increase in exports by a local firm is economic changes which can spur ripple

[2] We separate mission support contractors– individuals who work alongside uniformed and DoD civilian personnel at Fort Lee – from the garrison support contractors who provide services and goods generated off-post. This allows us to trace the industry-specific economic impacts of the various goods contractors produce.

effects or spin-off activities. Multipliers simply measure the economic impact of these new exports, including the resulting spin-off activities. The greater the multiplier, the greater the resulting impact is, positive or negative.

In table 2, the 1.41 employment multiplier for the Military Personnel indicates that, on the average, every addition or subtraction of 100 soldiers at Fort Lee will result in an associated addition or subtraction of 41 jobs in the local economy. Similarly, the income multiplier of 1.26 for military personnel indicates that each addition or subtraction of $1 million in income to military personnel will result in an additional gain or loss of $260,000 in income off-post. The 1.51 output multiplier for military personnel indicates the total change in the value of goods produced that will result from changes on-post.

These multipliers represent valuable planning tools with which local officials can begin to respond to future, and at this point unpredictable, changes in mission strength at Fort Lee. For example, the announced addition of 1,000 soldiers, coupled with the reduction of 200 DoD civilians, would result in the creation of 410 and subtraction of 60 off-post jobs, respectively. These multipliers facilitate the calculation of impact estimates that improve considerably on other back-of-the-envelope math. Needless to say, obvious caveats apply. If the incoming personnel hold a lower average rank than those already working at Fort Lee, their total pay, and hence total economic impact, will be lower. Additionally, private-sector contracting let through Fort Lee may have a larger impact on the local economy than these other, readily measurable, changes. Determining the scope of this local contracting, which we were not able to add to this model, should be a priority for future planning.

These composite estimates represent the simplest distillation of a complicated set of questions and estimates about Fort Lee and its impact on the region. The report that follows investigates those questions in detail. It provides detailed accounts of the top industries impacted by Fort Lee, of the total employee compensation and tax revenues attached to Fort Lee, and of the data, methods and assumptions we used to generate our results. Equally important, it frames those results in terms of relevance to key planning and policy decisions in the area.

INTRODUCTION

Fort Lee contributes hundreds of millions of dollars in annual spending into the Petersburg Area, through the spending of the post, of service members and civilians, and of their families. Soldiers stationed on-post spend their take-home pay and housing stipends in the area. Local contractors fulfill a significant amount of the work performed on-post. Students coming through Fort Lee's various training schools spend their pay in the area, and family members visiting for graduation generate demand for hotels, restaurants and rental cars. Individually, each of these economic impacts is straightforward. However, the extent of this impact as a whole remains difficult to understand. This report provides a comprehensive assessment of the total economic impact of all known Fort Lee activities on the Petersburg region as of 2011.

Understanding the total impact of Fort Lee assists in the assessment of local economic development activities by documenting which functions at Fort Lee are most crucial to the region, and by identifying the industries that are most likely to be impacted (positively or negatively) by future mission changes. The current defense situation remains dynamic, and will likely result in unexpected changes to the forecast for Fort Lee in the wake of the last military post consolidation. The 2005 Base Realignment and Closure (BRAC) Commission designated Fort Lee a major recipient of growth. The construction, troop increases and civil servant population increases that came with that growth have already delivered a significant impact to the region. The economic contribution of each of these groups varies depending on its unique characteristics. Students, for example, will attend the training school for a number of weeks. Some will stay on post (where their lodging expenditures will not be captured by the local economy); others will stay in hotels. Permanently assigned military members (staff and cadre, not students) are likely to bring spouses and dependents who will themselves find employment locally. And the presence of these personnel will bring an undetermined number of defense contractors to the region.[3]

However, the recent growth on Fort Lee carries no guarantee of permanence. In addition to changes in the international combat posture of the armed forces, the complicated and ever-changing negotiation around federal budgeting, and prospective cuts to the Department of Defense budget suggest that the Petersburg region, like any region that hosts a major military installation, will need to respond to additional defense adjustments of unforeseeable size and composition in the near future. The impact of these adjustments – both the overall magnitude and the affected industries – will vary in accordance with the specific functions on Fort Lee targeted for adjustment.

Accordingly, this report provides economic impact multipliers that can be used to quickly assess the total scope and sectoral impact of future mission changes. We take a two-part approach to estimating economic growth in the Petersburg area. The first part of the study maps all of the Fort Lee activities that impact the area's economic output, and the second part of the study itemizes the expected impact of each one. To facilitate easy analysis and future adaptation, we use a “modular” approach that separates the marginal economic impact of each factor.[4] This approach should assist the post community in understanding the relative impact and distinct economic footprint of each post activity. Rather than measuring the impact of mission growth after BRAC 2005, we simply measure the total

[3] The build-up at Fort Lee entails two types of contractors: "base" contractors stationed on-post whose pay is pegged to the levels set in the General Schedule for federal employees and "defense" contractors who operate as private firms outside the gate. This report includes estimates for post contractors, but data for off-post defense contractors were unavailable. Estimates of the economic impact of those defense contractors will be added to the study when sufficient data are obtained.

[4] At this point in time, detailed data on defense contractor activity in the area are unavailable. However, "base" contractors who perform basic functions in the day-to-day operation of Ft. Lee are included in the study. The 'modular' organization of this study will allow estimates of defense contractor impacts to be added quickly when they become available.

estimated impact of Fort Lee on the region during the calendar year 2011. This approach provides an easily understood baseline for evaluating the impact of future changes on-post.

After estimating Fort Lee's total economic impact, we provide measures of anticipated industry-by-industry impacts. These figures should be useful for answering basic questions about market size and composition, occupational demand, and permitting needs and restrictions for different types of business activities.

To make these estimates, we employed the input-output model Implan, produced by the Minnesota IMPLAN Group (MIG). MIG assembles data from national sources and modifies them with regional information, enabling analysts to model business and household interactions and estimate economic impacts in a given study area.

MEASURING ECONOMIC ACTIVITY AT FORT LEE: Key Figures and Assumptions

Our approach to modeling the economic impact of activity at Fort Lee treats each type of post activity as a triggering event that will create subsequent rounds of activity in the local economy. Each dollar spent by a military member or Department of Defense employee will circulate through the local economy multiple times. For example, the developer hired to build a home for an incoming officer will hire workers, purchase lumber, and pay architects to design the home. The lumber distributor, construction workers and architects in turn purchase a variety of locally produced inputs in order to deliver their work products, and spend their personal compensation on a variety of consumer items. Economic impact analysis of the kind we undertake in this report traces the cumulative impact of each dollar as it circulates from industry to industry within the local economy.[5] The core measure of this spending is the economic impact multiplier, a simple measure of the total expected economic output triggered by a single dollar in new spending. Depending on the type of activity, multipliers typically fall between 1.25 and 2.

The economic models used in this kind of analysis are static, rather than dynamic.[6] Once the basic model has been determined, it is the inputs into the model – the specific assumptions about who will be moving to the Fort Lee area, where they will live, what kind of family members they will bring, and the employment benefits they will receive – that determine the overall economic impact. Static models of this type are more reliable with small economic impacts. Large impacts, such as the impact from Fort Lee, are more likely to change the very structure of the economy on which the model is based. On the other hand, while static models somewhat limit the analysis, they are much more

[5] Following the Fort Lee Growth Management Plan, we define the local area as Chesterfield County, the City of Colonial Heights, Hopewell City, Dinwiddie County, Petersburg City and Prince George County. This region includes Chesterfield County's "Brandermill" corridor, where significant post-2005 development has occurred.
[6] With a few minor, technical exceptions. Please see Appendix A for details on the technical components of the models.

straightforward, and the assumptions behind them should be transparent to all. In all cases, reports of this type should be supplemented with local, on-the-ground knowledge of current economic events.

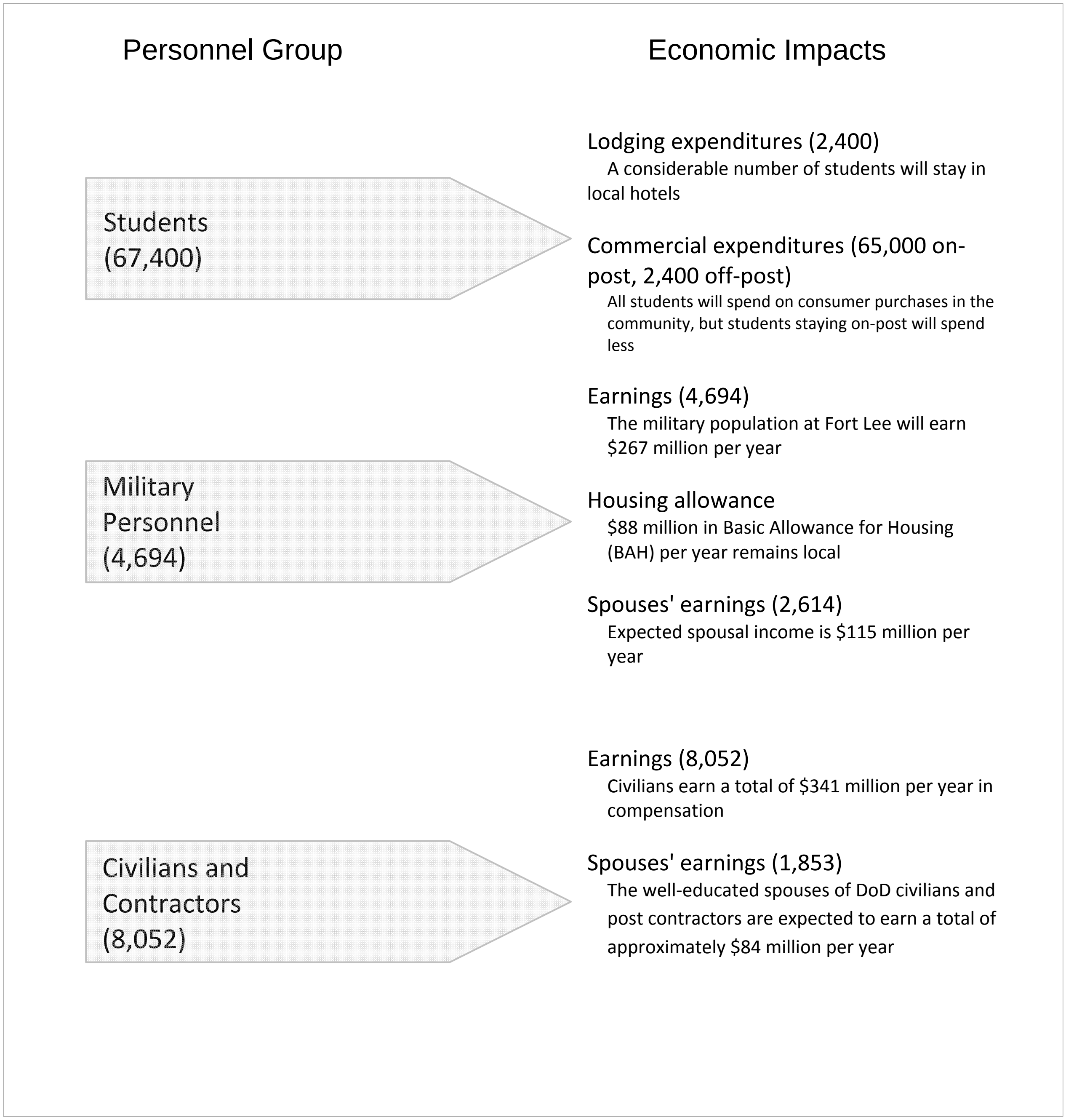
As of March 2012, BRAC coordinators at Ft. Lee identify four core groups of personnel on-post

- 67,400 students
- 4,694 military personnel
- 5,253 Department of Defense and other civilians
- 2,799 on-post contractors

Figure 1 below details the basic sets of economic impacts we track for each of these groups at Fort Lee. The rest of this section discusses the major analytical steps we used to determine the magnitude of initial change for these sources of impact.

The expected economic impact of each of these groups depends on several characteristics, such as rank (which determines salary) and support of dependents, (which determines Basic Allowance for Housing), on-post versus off-post residence (which determines the extent to which spending on housing is captured by the real estate industry) and propensity to spend locally. Figure 1 outlines the most important of these characteristics, as they influence our economic impact estimates.

Figure 1: Major Economic Impacts of Different Personnel Groups at Fort Lee



Note: Students are not a unitary population. This figure includes both the AIT and ALU categories. Please see the report's appendices for the breakdown of these two populations.

Students:
As a training-focused installation, Fort Lee brings in tens of thousands of armed forces students annually for Advanced Individual Training (AIT) courses and the Army Logistics University (ALU) training courses. Each set of students pumps money into the local economy through a combination of consumer spending, off-post hotel stays and, in the case of AIT students, by drawing family members to the region to attend graduation ceremonies. Because Fort Lee's training activities differ in terms of the students they draw and the amount of off-post spending, we enter them separately into the economic impact model.

Advanced Individual Training*:* Over the course of a 50-week training year, a total of 65,000 students attend several weeks of Advanced Individual Training. For the great majority of time, they eat, sleep, learn and recreate on post, and as a result do not engage in spending that impacts the local economy. But weekend leave is part of the program. Fort Lee estimates that 25-30% of AIT students receive two-day leaves per week. Splitting the difference, we estimate that 27.5%, or 17,875 students take leave on any weekend. Over the course of a 50-week session, this equates to 893,750 individual soldier-days of leave.

Infrequent as it is, that leave delivers a significant economic impact in the aggregate. Beginning with estimated spending of $200 per day,[7] we subtracted the mid-point estimate of local hotel rates ($79), to determine that students spent $121 per day on a mix of entertainment and local services, and the remainder on lodging.

Additionally, AIT students often draw family members to the region to attend graduation ceremonies. Based on input from the Fort Lee region, we estimate that family members of one-quarter of the students (16,250) attend graduation ceremonies in a given year. Working from an estimate of $150 spent per visiting family, we entered a mix of $2,437,500 in lodging local services and eating and drinking establishments into Implan.

Army Logistics University: As of 2011, the Army Logistics University had an average daily student load of 2,400. The main impact of these students comes from off-post lodging.[8] Over the course of 50 weeks, those students book a total of 840,000 nights of lodging in area hotels. Under the Lodging Success Program, each of those stays costs $64.43 per night. This leads to an annual total of $54.12 million spent on lodging. Additionally, a survey of the students showed that they spend $245 (2010 dollars) weekly on various consumer industries.[9] This spending totals nearly $31.5 million per year, a figure we entered into Implan in the respective industries.

[7] Please see pp. 45 and 47 in Fort Lee Growth Management Plan by RKG Associates, Inc. While those students are not directly comparable to AIT students, the survey provides the best available starting point for estimates of spending. Please see Appendix B for further details.
[8] The planned construction of on-post lodging facilities in the near future will significantly reduce the impact from this baseline estimate.
[9] Please see pp. 45 and 47 in Fort Lee Growth Management Plan by RKG Associates, Inc.

Government Sectors (Federal Military and Civilian Employment):

To estimate the impact of military presence on-post, we used the employment figures provided by Fort Lee and military personnel pay levels data.[10] We utilized RKG Associates' survey of military personnel ranks to estimate rank distribution of total military personnel on the base. This finely grained pay data provided great detail on overall compensation. But paycheck totals only represent the most readily measureable economic impact military and civilian personnel have on the local economy. Military members contribute significant additional economic activity through the use and expenditure of non-wage income:

- Basic Allowance for Housing (BAH). BAH expenditures function as an income supplement, allowing military members to spend their paychecks on other goods and services. To incorporate these expenditures into the model, we started with the total number of military personnel provided by Fort Lee. We then imputed information on rank, and family structure by rank, to develop a full list of household size for each class of enlisted soldier and officer. This allows us to add monthly BAH estimates, which ranged from $1,030 to $2,404. The total amount of BAH for Fort Lee was estimated to be $88 million.

- Basic Allowance for Subsistence (BAS). BAS is meant to offset costs for a member's meals. Because BAS is intended to provide meals for the service member, its level is linked to the price of food. Therefore, each year it is adjusted based upon the increase of the price of food as measured by the USDA food cost index. In order to incorporate spending resulting from BAS into our model, we used 2011 BAS rates, which are approximately $223 for officers and $325 for enlisted military personnel per month. The total amount of BAS for Fort Lee was estimated to be $17 million.

- Healthcare spending. Formally, military personnel receive all health care through the Armed Forces, effectively removing this significant source of spending from the private-sector economy. However, limited availability of some services on-post, as well as the convenience of off-post access, especially for family members, pushes many of these services into the private sector. According to the U.S. Office of Personnel management (OPM), the typical federal worker received healthcare benefits worth $1,464 per quarter.[11] That figure equates to $5,856 annually, approximately 15% of the typical DoD civilian's pay, and approximately 12% of the pay of a typical soldier stationed at Fort Lee. For military members, we enter $2,928 in healthcare spending into Implan. This figure reflects the assumption that military personnel consume half of their healthcare on-post, where their spending is not captured by the local economy.

[10] Available at www.militaryfactory.com
[11] See http://www.opm.gov/retire/pubs/bals/2012/12-306.pdf

- Spouses. Person per person, the military spouses in the Fort Lee area contribute significantly to the local economy. In particular, those employed in the private sector work for businesses that contribute significant “indirect” economic impacts through purchases (of real estate, office supplies, computers, utilities, legal and business services, etc.) from other local businesses. This stands in contrast to military and DoD activities, many of which operate through nationwide procurement networks that steer purchasing outside of the local economy.[12] We combined data on spousal employment (sorted by industry) from the 2009 American Community Survey with estimates of rank for Fort Lee soldiers to determine the total number of jobs held by military spouses. We entered these employment totals (2,614 military spousal employees, 1,215 civilian spouse employees, and 638 contractor spouse employees) into Implan in the relevant industries.

The process for determining the economic impact of Department of Defense civilians was more straightforward. The Crater Planning District provided total personnel counts and information on payroll figures for the Defense civilians employed on-post as of 2011. We augmented payroll information with two additional sources of local economic impact:

- Healthcare spending. According to the U.S. Office of Personnel Management (OPM), the typical payroll employee in the United States receives healthcare benefits worth on average 15% of total salary. OPM estimates the cost for health coverage for federal workers in February at $1,464 per quarter in 2012.[13] That equates to $5,856 per year. We apply the 15% figure uniformly for civilians working at Fort Lee.

- Based on a civilian payroll total of $194 million, we applied this figure to derive an estimate of health benefits spending of $29 million. Because Department of Defense civilians are insured through private carriers, we anticipate all of this spending falling within the local economy.

- Spouses. As is the case with military spouses, the spouses of Department of Defense civilians can be expected to contribute significantly to the local economy, especially when considering the propensity of highly educated workers to marry other highly educated (and comparatively well-paid) workers.[14] But a number of factors limit the propensity of those spouses to migrate to the area. In particular, the proximity of the relocated Defense Contract Management Agency command to the Washington, D.C. area from which many civilian personnel have transferred should lead a substantial number of employees to

[12] Many Army helmets, for example, are made in North Dakota, while Modular Lightweight Load Carrying Equipment (MOLLE) gear is manufactured in Missouri and Massachusetts. By contrast, military and DoD civilian spouses employed in the private sector work for businesses that pay rent to local landlords, service fees to local vendors, etc.

[13] See http://www.opm.gov/retire/pubs/bals/2012/12-306.pdf

[14] Data from the 2009 American Community Survey show that median educational attainment of federal civilian workers’ spouses rises with civilian workers’ pay level and educational attainment.

commute (either daily or weekly) rather than relocate, especially in the short term. While figures from the American Community Survey suggest that current DoD civilian employees at Fort Lee should have 2,650 employed spouses in the area, we added the assumption that 10% of those jobs were filled locally, and that 50% of the remaining DoD Civilian personnel commute weekly from the Washington area. This results in an estimate of 1,215 locally employed spouses. We entered this total into Implan, once again using American Community Survey data to estimate the number of spouses employed in particular sectors.

Contracting:
Contracting at Fort Lee impacts the local economy in two significant ways. First, Fort Lee employs a significant number of "on-post" private-sector contractors who work alongside military personnel and DoD civilians. Second, Fort Lee contracts with a number of local firms for goods and services essential to the day-to-day operation of the base. Each of these types of contracting generates substantial activity in the local economy.

In Fiscal Year 2011, Fort Lee employed approximately 2,799 on-post contractors in mission and mission support organizations. Roughly 500 of these contractors worked as instructors, and the rest worked in maintenance, IT support and logistics (280 each) or programming (792), with pay scales that roughly matched those of Department of Defense Civilians.[15] Through interviews with Fort Lee personnel, we matched these individuals' job descriptions to descriptions of the qualifications for each General Schedule grade for federal civilians. This resulted in an estimated distribution of total pay ranges. The job descriptions for maintenance personnel, for example, required minimal education and few formal skills, leading us to assign these workers grades between GS-2 and GS-4 (on a scale ranging from GS-1 to GS-12). By contrast, the educational requirements for programmers ranged from a college education to a Ph.D., leading us to assign grades between GS-5 and GS-11. These estimates led to the following distribution (Table 3):

[15] Source: Private data request from Fort Lee, June 2011.

Table 3: Estimated General Schedule Pay Grade Equivalents of Fort Lee on-post Contractors, 2011

Grade	Employee Count	Median Annual Pay
GS-1	0	$17,803
GS-2	163	$17,803
GS-3	93	$22,568
GS-4	163	$26,152
GS-5	486	$30,173
GS-6	125	$34,653
GS-7	416	$37,378
GS-8	195	$43,901
GS-9	291	$45,718
GS-10	0	$53,401
GS-11	198	$56,991
GS-12	669	$70,319

We entered these figures into Implan as payroll for current federal employees. As is the case for other non-military workers, we add 15% to total pay to reflect off-post healthcare spending. This yields total pay of $ 119 million. We applied the same spousal employment figures and assumptions used for DoD civilians to estimate that these on-post contractors have 638 spouses working in the local labor market.

The more substantial contracting impact comes from contracts issued by Fort Lee for services and goods essential to the day-to-day operation of the facility. These include contractors for construction, road and facilities maintenance, foods services, business services and waste hauling. Officials from the Crater Planning District provided a full list of these contracts, totaling $78.07 million, for Fiscal Year 2010. Because contracts issued by the post have different terms and different fulfillment processes, we compared the FY'10 contract figures to figures for previous years, and confirmed that the FY'10 data was representative of a typical year.

The next step was to adjust these figures to reflect mission growth between FY'10 and FY'11. We did this by comparing the military personnel levels reported by the Army for each fiscal year, and creating an "adjustment factor" of 1.064 to scale the overall size of these contracts to personnel strength at Fort Lee. As is the case for all data inputs, we adjusted this revised figure for inflation.

The next challenge was to identify the industries into which to enter the totals for each contract. We did this by researching the eight firms receiving contracts. In many cases, this allowed us to identify a mix of representative industry codes that more faithfully matched the work performed by these contractors than does a single, self-reported North American Industrial Classification System (NAICS) Code. For example, we were able to identify that the contractor Centennial, a construction firm, provided a mix of nonresidential construction work, maintenance and architectural and engineering services. Spreading its contract out over these industrial categories yielded a mix of projected activity that closely fits the actual work performed.

ANALYSIS AND RESULTS

An initial change or triggering event, also referred to as the direct impact, spurs subsequent indirect and induced activities resulting from interconnected economic relationships:

The direct impact is the projected change in the local economy under consideration. In this case, the direct impact being modeled is Fiscal Year 2011 troop and personnel levels at Fort Lee. Because we measure the total impact of the installation, rather than the impact of growth authorized by BRAC 2005, this number represents the impact to the region of having Fort Lee. It also includes the economic impact of spouses who live in the region due to an individual stationed at, assigned to, or employed at Fort Lee.

Indirect effects result from business-to-business interactions altered by the direct impact. An example of an indirect effect is job creation at a local building services company due to the additional work generated by the expansion of an area hotel.

Induced effects represent the impacts caused by adjustments in the consumption expenditures of households in response to changes in income resulting from the direct and indirect impacts. An example of an induced effect is an increase in area retail employment due to increased retail shopping volume after job creation in government military and government non-military sectors.

Economic impacts are measured in terms of changes in economic activity and associated changes in employment and wages. They are reported as follows:

Output is the total value of goods and services produced in an industry or industry sector across all stages of production.

Employment is calculated as the number of jobs needed to support a given amount of economic activity in an industry or industry sector. It includes all wage and salary employees, both part- and full-time, as well as self-employed workers. Employment is measured in terms of the number of annual (one-year full-time equivalent) jobs.

Tax represents the total *local and state* taxes paid by corporations, businesses, and households. In this case, we measure increased tax payments due to growth in overall economic activity.

IMPACT RESULTS AND ANALYSIS

Military personnel and their spouses are predicted to have the largest cumulative economic impact on the region. Our model indicates that post military personnel with their spouses and allowances for housing have an impact of $1.19 billion and account for the largest share of the total impact of $2.4 billion by a significant margin. Civilian personnel with their spouses account for $592 million in total output. At $168 million, students are anticipated to have a large overall economic impact, but not nearly as large as that of civilian or permanent military personnel. Table 4 itemizes total economic, employment and tax impacts by origin.

Military personnel are expected to have the largest cumulative economic impact on the region. The average military personnel salary is more than $56,000, while average annual pay for civilian personnel is around $42,000.

As a result of the commuting patterns discussed earlier and various demographic factors, the number of military spouses (2,614) moving to the area is expected to significantly exceed the number of civilian spouses (1,215). Notably, spouses tend to have a larger economic impact than people who work on post. Indirect economic impacts are the reason. As discussed above, the Army and DoD purchase most of the supplies and services needed to run Fort Lee through federal procurement plans that steer minimal economic activity into the Fort Lee area. But spouses employed in the private economy behave like other private sector employees, using a large portion of local goods and services to do their jobs. Person for person, these workers have a larger economic impact than do DoD civilians or military personnel. Thus, the anticipated high rate of spousal accompaniment for DoD civilians is a crucial component of the expected economic gains to the area.

Income is another important component of the story. The jobs that are estimated to exist as a result of activities in the area at Fort Lee comprise approximately 12.28%% of the area's 2008 employment. But they are estimated to contribute 13.62% of regional gross product. In other words, jobs at Fort Lee pay more on the average and contribute more to local economic activity than do jobs off-post.[16]

Table 5, 6, and Table 7 itemize the anticipated direct, indirect and induced impacts for employment, income, and for total economic output, respectively.

[16] Implan's output-to-employment ratios, which measure the amount of employment needed to produce a certain level of economic output, confirm this finding. While the current output-to-employee ratio is $77,348, the comparable ratio for new jobs is $87,679.

Table 4: Summary of Total Impacts by Sources of Impact

Type of Impact / Sources of Impact	Military Personnel[17]	DoD Civilians[18]	On-Post Contract Employees[19]	Students[20]	Support Contractors	Total
Employment	11,735	8,391	4,452	2,287	1,121	27,986
Output (1000$)	1,199,550	592,208	313,038	168,022	127,970	2,400,788
Income (1000$)	593,765	346,441	183,508	55,422	46,492	1,225,628
Tax (1000$)	58,418	30,077	15,819	13,323	7,152	124,789

Table 5: Summary of Employment Impacts by Types of Impact

Type of Impact	Military Personnel	DoD Civilians	On-Post Contract Employees	Students	Support Contractors	Total
Direct	8,327	6,468	3,435	1,774	769	20,773
Indirect	478	208	108	235	132	1,161
Induced	2,931	1,715	909	279	220	6,054
Total	**11,735**	**8,391**	**4,452**	**2,287**	**1,121**	**27,987**
Multiplier	***1.41***	***1.30***	***1.30***	***1.29***	***1.46***	***1.35***

Table 6: Summary of Income Impacts by Types of Impacts (1000 $)

Type of Impact	Military Personnel	DoD Civilians	On-Post Contract Employees	Students	Support Contractors	Total
Direct	470,292	277,846	147,258	36,196	32,131	963,723
Indirect	22,317	9,583	4,992	9,775	6,432	53,099
Induced	101,156	59,012	31,258	9,450	7,930	208,806
Total	**593,765**	**346,441**	**183,509**	**55,422**	**46,493**	**1,225,628**
Multiplier	***1.26***	***1.25***	***1.25***	***1.53***	***1.45***	***1.27***

Table 7: Summary of Output Impacts by Types of Impacts (1000 $)

Type of Impact	Military Personnel	DoD Civilians	On-Post Contract Employees	Students	Support Contractors	**Total**
Direct	791,886	365,320	193,110	107,084	83,451	1,540,851
Indirect	68,167	28,798	14,999	29,177	17,966	159,107
Induced	339,497	198,090	104,929	31,762	26,554	700,832
Total	**1,199,550**	**592,208**	**313,038**	**168,023**	**127,971**	**2,400**
Multiplier	***1.51***	***1.62***	***1.62***	***1.57***	***1.53***	***1.56***

[17] Military impacts include officers, enlisted personnel, their spouses, housing and health benefits.
[18] Civilian impacts include civilian government employees, their spouses, and health benefits.
[19] Contractor impacts include contractor employees, their spouses, and health benefits.
[20] Student impacts include off-post lodging and other commercial expenditure of students/trainees and spending of graduation visitors.

Economic output multipliers provide another measure of the expected impacts. An output multiplier is a simple measure that compares the direct economic impact to the total economic impacts. If $100 in new spending triggers $175 in total economic growth, the output multiplier is 1.75. Output multipliers for private sector activity typically range between 1.25 and 2.0. Figure 2 and 3 below confirm the expectation that the overall multiplier attached to the activities of Fort Lee falls in the middle of the spectrum. For every $1 spent in the military build-up, an additional 55 cent worth of output is created in the local economy. Considering that military and DoD procurement removes indirect economic impacts (which often represent approximately one quarter of the overall impact amount) this multiplier is of reasonable size, thanks in part to the high pay levels of the post personnel.

Figure 2 also facilitates comparison of the employment multiplier impacts of the various components of mission growth. This should prove a useful reference in the event that the services adjust the expected count of military personnel, civilians or students. After the installation and its purchasing needs, military personnel have the largest multiplier of any group associated with mission growth due to their high salaries and consumption patterns (despite our assumption of zero indirect impacts). As might be expected, increases or decreases in the number of personnel in these groups will have the largest proportional impact on the economy. After students, contractors and civilians have the lowest multiplier at 1.30. This can be attributed to the generally low skill levels associated with some contractor jobs, and to the necessity of excluding indirect impacts due to lack of data. Overall, the employment multipliers suggest that in relative terms, contractors, civilian personnel and students have a smaller economic impact than other groups working at Fort Lee.

Figure 2: Employment Multipliers by Sources of Impact

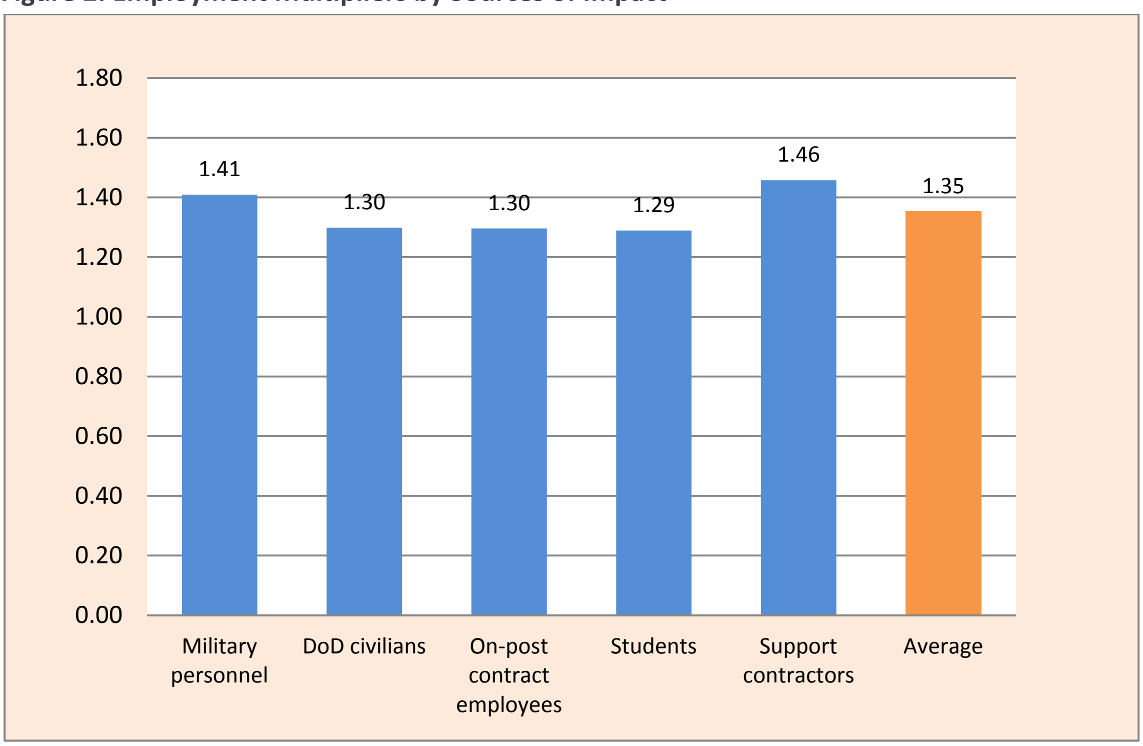
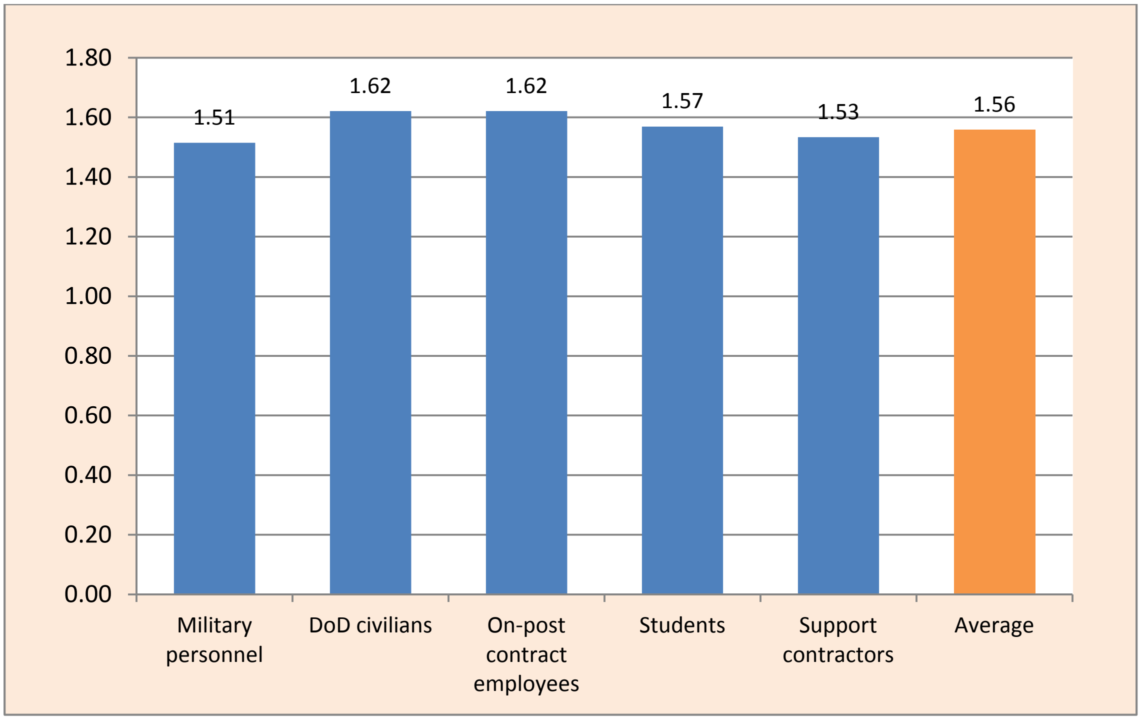


Figure 3: Output Multipliers by Sources of Impact



IMPACTS BY INDUSTRY

One of the advantages of modeling economic changes with Implan is the ability to estimate industry-level impacts. A detailed assessment of the industries that are expected to grow in the area may help decision makers to develop appropriate market analysis and policies for job training, permitting and economic development.

Table 8 shows the most heavily impacted industries in terms of net employment. As expected, government positions (both military and non-military) account for the top two positions. They are followed by eating and drinking places (1,881 employees), followed by hotels and motels (1,187 employees). These findings make sense, given what is known about the spending patterns of military personnel and the large contribution of students (many of whom stay in off post hotels and motels) to the expected mission growth. Food and drinking establishments, along with the hotel and motel industry, are the largest beneficiaries. (The food and drinking places industry typically is affected by almost any new expenditure occurring in the local economy due to indirect spending of compensation earnings. See Appendix C). In general, the list of most heavily impacted industries consists of service sectors that mostly provide jobs with minimal skills requirements.

Table 8: Employment Impacts in Top 10 Impacted Industries by Source of Impact

Sector / Sources of Impact	Military Personnel	DoD Civilians	On-Post Contract Employees	Students	Support Contractors	Total
Federal government, non-military	162	5,326	2,837	0	0	8,325
Federal government, military	5,709	0	0	0	0	5,709
Food services and drinking places	593	322	170	420	376	1,881
Hotels and motels, including casino hotels	71	29	16	1,068	3	1,187
Private hospitals	262	135	72	13	10	491
Offices of physicians, dentists, and other health practitioners	258	125	66	16	12	477
Retail Stores- General merchandise	285	106	56	13	13	472
Real estate establishments	229	113	60	31	17	451
Retail Stores - Food and beverage	161	93	50	100	11	415
Private elementary and secondary schools	249	98	51	2	1	402

Table 9 shows the relative contribution of each impact source (military personnel, civilians, spouses, students' spending, etc.) to industry growth. Again, the information presented in these tables can be used to adjust expected industry impacts in the event that planned levels of troops and/or DoD civilians change.

Table 9: Output Impacts in Top 10 Impacted Industries by Sources of Impact (Thousands of Dollars)

Sector / Sources of Impact	Military Personnel	DoD Civilians	On-Post Contract Employees	Students	Support Contractors	Total
Federal government, military	520,549	0	0	0	0	520,549
Federal government, non-military	16,326	260,246	138,579	0	0	415,151
Imputed rental activity for owner-occupied dwellings	53,396	31,090	16,466	4,981	4,300	110,233
Food services and drinking places	30,170	16,400	8,650	21,288	19,210	95,718
Hotels and motels,	5,001	2,033	1,079	71,412	204	79,729

including casino hotels						
Real estate establishments	36,584	17,938	9,505	4,690	2,870	71,587
Offices of physicians, dentists, and other health practitioners	32,454	15,678	8,327	1,947	1,579	59,985
Private hospitals	28,213	14,751	7,904	1,329	1,113	53,910
Insurance carriers	25,592	11,375	6,042	1,757	1,073	45,839
Wholesale trade businesses	23,973	10,343	5,391	2,273	2,329	44,309

APPENDIX

APPENDIX A: ASSUMPTIONS

This economic impact study was conducted using input-output modeling. Input-output models trace the purchasing relationships among businesses, government, and consumers to provide a full accounting of the way spending flows through a regional economy. By accounting for linkages across industries and other economic sectors, input-output analysis documents the multiple ways in which a change in one industry impacts other industries and consumers.

Like any other economic model, an input-output model is a simplification of the complex world. It is important to be aware of assumptions incorporated into the model when interpreting economic impact estimates and developing policy responses. A first key assumption made in the input-output model is that a one dollar increase or decrease in industry output will always have the same effect on the economy. In mathematical terms, this means that input-output analysis treats industry production as "linear", with "constant returns to scale." This is a simplification. For example, a plant that is already operating at full capacity may need to undertake larger-than-average expenditures in order to generate additional production. At the other end of the spectrum, a plant that ceases production may have already eliminated many critical functions, and the reduction in spending may be less than predicted in the model.

A second key assumption is that supplies are unconstrained. Industries have unfettered access to raw materials and their output is limited only by the demand for their products. Input scarcities are not considered.

A third key assumption is that firms do not substitute inputs. Input-output analysis will not be as accurate in cases in which a long-term spike in costs or a shortage in supply causes businesses to develop new suppliers or make their products differently.

APPENDIX B: IMPLAN ENTRIES[21]

1. ***Students***

Table B-1: Students' Expenditure on Lodging

Code	Industry	Final Change in Demand ($)
411	Hotels and motels, including casino hotels	71,141,766

AIT Students (Ordnance, Quartermaster, Culinary, Transportation)

(1) # of students = 65,000
(2) Average daily load of students = 7,200

[21] Dollar figures are adjusted for inflation using the U.S. Bureau of Labor Statistics consumer price index. All monetary figures are in 2011 dollars.

(3) Average duration of each student stay = 50 weeks
(4) # of off-post stays = [(7,200 .25) + (7,200 x .30)]/2 x 50 x 2 = 198,000[22] (total off-post stays)
(5) Average cost of off-post stay = $ 79.43[23]
(6) Annual cost of all off post student stays = (4) x (5) = 198,000 x 79.43 = $ 15,727,140

ALU Students

(1) Average daily load of students = 2,400
(2) # of weekly student stays =2,400 x 50 = 120,000
(3) # of annual stays = 120,000 x 7 = 840,000 (total off-post stays)
(4) Average cost of off-post stay = $ 64.4332[24]
(5) Annual cost of all off post student stays = (4) x (5) =840,000 x 64.4332 = $ 54,123,888

Graduation Visits

(1) # of AIT Student graduation = 65,000
(2) # of expected annual graduation visits =65,000 / 4 = 16,250
(3) Average cost of off-post stay = $ 79.43
(4) Annual cost of all visitor stays = (3) x (4) =16,250 x 79.43 = $ 1,290,738

Table B-2: Students' Commercial Spending[25]

Code	Industry	Final Change in Demand ($)
322	Retail - Electronics and appliances	3,188,626
324	Retail - Food and beverage	16,812,755
325	Retail - Health and personal care	2,029,126
327	Retail - Clothing and clothing accessories	3,478,501
328	Retail - Sporting goods, hobby, book and music	5,217,751
407	Fitness and recreational sports centers	3,768,376
413	Food services and drinking places	17,669,642
414	Automotive repair and maintenance, except car washes	2,029,126
419	Personal care services	2,319,001
	Total	**56,512,903**

A. 2. Military

Table B-3: Military personnel (employment)

Code	Industry	Final Change in Employment
440	Employment and payroll for Federal Military	4,694

[22] 25-30% of AIT students are allowed to leave post during the each weekend. These students/trainees patronize local hotels and eating and shopping establishments.
[23] Please see pp. 20 and 32 in Fort Lee Growth Management Plan by RKG Associates, Inc.
[24] Please see pp. 1, 20 and 32 in Fort Lee Growth Management Plan by RKG Associates, Inc.
[25] Please see pp. 45 and 47 in Fort Lee Growth Management Plan by RKG Associates, Inc.

Table B-4: Military personnel (payroll)

Code	Industry	Change in Employee Compensation ($)
440	Employment and payroll for Federal Military	267,236,631

Table B-5: Housing Allowances for Military Personnel

Code	Industry	Change in Employee Compensation ($)
440	Employment and payroll for Federal Military	88,113,567

Table B-6: Military Spousal Employment

Code	Industry	Final Change in Employment
2	Grain farming	3
11	Cattle ranching and farming	3
20	Oil and gas extraction	3
31	Electric power generation, transmission, and distribution	3
33	Water, sewage and other systems	3
34	Construction of new nonresidential commercial and health care structures	46
59	Animal (except poultry) slaughtering, rendering, and processing	3
62	Bread and bakery product manufacturing	3
69	All other food manufacturing	3
70	Soft drink and ice manufacturing	3
78	Broad-woven fabric mills	8
85	All other textile product mills	3
99	Other cut and sew apparel manufacturing	3
113	Printing	5
122	Synthetic dye and pigment manufacturing	3
133	Pharmaceutical preparation manufacturing	3
154	Brick, tile, and other structural clay product manufacturing	3
170	Iron and steel mills and ferroalloy manufacturing	3
234	Electronic computer manufacturing	3
239	Other communications equipment manufacturing	3
246	Printed circuit assembly (electronic assembly) manufacturing	3
249	Search, detection, and navigation instruments manufacturing	3
272	Communication and energy wire and cable manufacturing	3
283	Motor vehicle parts manufacturing	19
298	Wood kitchen cabinet and countertop manufacturing	3
305	Surgical and medical instrument manufacturing	3
313	Office supplies (except paper) manufacturing	8
319	Wholesale trade	27
320	Retail - Motor vehicle and parts	19

321	Retail - Furniture and home furnishings	11
322	Retail - Electronics and appliances	19
323	Retail - Building material and garden supply	24
324	Retail - Food and beverage	49
325	Retail - Health and personal care	40
326	Retail - Gasoline stations	11
327	Retail - Clothing and clothing accessories	30
328	Retail - Sporting goods, hobby, book and music	19
329	Retail - General merchandise	154
330	Retail - Miscellaneous	46
331	Retail - Nonstore	13
332	Air transportation	5
335	Truck transportation	8
336	Transit and ground passenger transportation	8
338	Scenic and sightseeing transportation and support activities for transportation	5
339	Couriers and messengers	3
340	Warehousing and storage	3
341	Newspaper publishers	8
342	Periodical publishers	3
346	Motion picture and video industries	5
348	Radio and television broadcasting	11
351	Telecommunications	16
352	Data processing, hosting, and related services	3
353	Other information services	11
354	Monetary authorities and depository credit intermediation	78
355	Non-depository credit intermediation and related activities	19
356	Securities, commodity contracts, investments, and related activities	13
357	Insurance carriers	43
360	Real estate	51
362	Automotive equipment rental and leasing	3
364	Video tape and disc rental	13
367	Legal services	30
368	Accounting, tax preparation, bookkeeping, and payroll services	16
369	Architectural, engineering, and related services	19
370	Specialized design services	3
371	Custom computer programming services	13
374	Management, scientific, and technical consulting services	16
376	Scientific research and development services	8
377	Advertising and related services	3
379	Veterinary services	24

380	All other miscellaneous professional, scientific, and technical services	11
382	Employment services	30
383	Travel arrangement and reservation services	8
384	Office administrative services	13
386	Business support services	27
387	Investigation and security services	13
388	Services to buildings and dwellings	11
390	Waste management and remediation services	3
391	Elementary and secondary schools	232
392	Junior colleges, colleges, universities, and professional schools	30
393	Other educational services	19
394	Offices of physicians, dentists, and other health practitioners	92
395	Home health care services	24
396	Medical and diagnostic labs and outpatient and other ambulatory care services	65
397	Hospitals	129
398	Nursing and residential care facilities	59
399	Child day care services	121
400	Individual and family services	27
401	Community food, housing, and other relief services, including rehabilitation services	3
402	Performing arts companies	5
406	Museums, historical sites, zoos, and parks	8
409	Amusement parks, arcades, and gambling industries	38
411	Hotels and motels, including casino hotels	46
412	Other accommodations	3
413	Food services and drinking places	181
414	Automotive repair and maintenance, except car washes	13
415	Car washes	5
417	Commercial and industrial machinery and equipment repair and maintenance	3
418	Personal and household goods repair and maintenance	3
419	Personal care services	32
420	Death care services	5
421	Dry-cleaning and laundry services	3
422	Other personal services	5
423	Religious organizations	8
424	Grant making, giving, and social advocacy organizations	16
425	Civic, social, professional, and similar organizations	3
426	Private households	13
427	Postal service	8
437	Employment and payroll for SL Government Non-Education	86

439	Employment and payroll for Federal Non-Military	162
Total		**2,614**

3. Civilian

Table B-7: Civilians (employment)

Code	Industry	Final Change in Employment
439	Employment and payroll for Federal Non-Military	5,253

Table B-8: Civilians (payroll and health care benefits)

Code	Industry	Change in Employee Compensation ($)
439	Employment and payroll for Federal Non-Military	222,627,621

Table B-9: Civilian Spousal Employment

Code	Industry	Final Change in Employment
34	Construction of new nonresidential commercial and health care structures	44
283	Motor vehicle parts manufacturing	30
319	Wholesale trade	14
320	Retail - Motor vehicle and parts	15
322	Retail - Electronics and appliances	15
323	Retail - Building material and garden supply	15
324	Retail - Food and beverage	28
325	Retail - Health and personal care	15
327	Retail - Clothing and clothing accessories	14
328	Retail - Sporting goods, hobby, book and music	15
329	Retail - General merchandise	29
330	Retail - Miscellaneous	15
335	Truck transportation	15
338	Scenic and sightseeing transportation and support activities for transportation	15
351	Telecommunications	15
354	Monetary authorities and depository credit intermediation	28
355	Non-depository credit intermediation and related activities	15
356	Securities, commodity contracts, investments, and related activities	15
357	Insurance carriers	15
360	Real estate	15
367	Lessors of nonfinancial intangible assets	15
368	Accounting, tax preparation, bookkeeping, and payroll services	15
369	Architectural, engineering, and related services	28

371	Custom computer programming services	14
374	Management, scientific, and technical consulting services	15
376	Scientific research and development services	15
382	Employment services	15
387	Investigation and security services	15
388	Services to buildings and dwellings	15
391	Elementary and secondary schools	88
392	Junior colleges, colleges, universities, and professional schools	28
393	Other educational services	15
394	Offices of physicians, dentists, and other health practitioners	28
395	Home health care services	15
396	Medical and diagnostic labs and outpatient and other ambulatory care services	14
397	Hospitals	57
398	Nursing and residential care facilities	15
399	Child day care services	28
400	Individual and family services	15
402	Performing arts companies	15
406	Museums, historical sites, zoos, and parks	15
409	Amusement parks, arcades, and gambling industries	14
411	Hotels and motels, including casino hotels	15
413	Food services and drinking places	88
414	Automotive repair and maintenance, except car washes	15
419	Personal care services	15
423	Religious organizations	15
424	Grantmaking, giving, and social advocacy organizations	15
426	Private households	15
427	Postal service	15
437	Employment and payroll for SL Government Non-Education	73
439	Employment and payroll for Federal Non-Military	73
Total		**1,215**

4. *Mission Support Contracting*

Table B-10: Contractors (employment)

Code	Industry	Final Change in Employment
439	Employment and payroll for Federal Non-Military	2,799

Table B-11: Contractors (payroll and health care benefits)

Code	Industry	Change in Employee Compensation ($)
439	Employment and payroll for Federal Non-Military	118,624,541

Table B-12: Contractors' Spousal Employment

Code	Industry	Final Change in Employment
34	Construction of new nonresidential commercial and health care structures	23
283	Motor vehicle parts manufacturing	14
319	Wholesale trade	6
320	Retail - Motor vehicle and parts	7
322	Retail - Electronics and appliances	7
323	Retail - Building material and garden supply	7
324	Retail - Food and beverage	15
325	Retail - Health and personal care	7
327	Retail - Clothing and clothing accessories	6
328	Retail - Sporting goods, hobby, book and music	8
329	Retail - General merchandise	15
330	Retail - Miscellaneous	8
335	Truck transportation	8
338	Scenic and sightseeing transportation and support activities for transportation	8
351	Telecommunications	8
354	Monetary authorities and depository credit intermediation	15
355	Non-depository credit intermediation and related activities	8
356	Securities, commodity contracts, investments, and related activities	8
357	Insurance carriers	8
360	Real estate	8
367	Lessors of nonfinancial intangible assets	8
368	Accounting, tax preparation, bookkeeping, and payroll services	8
369	Architectural, engineering, and related services	15
371	Custom computer programming services	6
374	Management, scientific, and technical consulting services	8
376	Scientific research and development services	8
382	Employment services	8
387	Investigation and security services	8
388	Services to buildings and dwellings	8
391	Elementary and secondary schools	46
392	Junior colleges, colleges, universities, and professional schools	15
393	Other educational services	15
394	Offices of physicians, dentists, and other health practitioners	15
395	Home health care services	8
396	Medical and diagnostic labs and outpatient and other ambulatory care services	6

397	Hospitals	31
398	Nursing and residential care facilities	8
399	Child day care services	15
400	Individual and family services	8
402	Performing arts companies	8
406	Museums, historical sites, zoos, and parks	8
409	Amusement parks, arcades, and gambling industries	6
411	Hotels and motels, including casino hotels	8
413	Food services and drinking places	46
414	Automotive repair and maintenance, except car washes	8
419	Personal care services	8
423	Religious organizations	8
424	Grant making, giving, and social advocacy organizations	8
426	Private households	8
427	Postal service	8
437	Employment and payroll for SL Government Non-Education	38
439	Employment and payroll for Federal Non-Military	38
Total		**638**

5. Garrison Support Contracting

Table B-13: Installation Costs at Fort Lee in 2011

Contractors	Amount of Contracting in 2010	Amount of Contracting in 2011	Industries to be Directly Impacted	Share of Industry (%)	% of Local Change	Amount of Change in Demand in 2011[26]
Centennial	18,792,088	20,013,282	36 Construction of other new nonresidential structures	50	100	10,306,840
			39 Maintenance and repair construction of nonresidential structures	40	100	8,245,472
			369 Architectural, engineering, and related services	10	100	2,061,368
Dominion VA Power	15,123,907	16,106,726	31 Electric power generation, transmission, and distribution	100	100	16,589,928
GENCO	20,082,820	21,387,892	39 Maintenance and repair construction of nonresidential structures	100	100	22,029,528
Commonwealth of Virginia Dept of Blind and Vision Impaired	15,784,075	16,809,795	413 Food services and drinking places	100	100	17,314,089
Logistics Management Resources Inc - LMR	4,208,632	4,208,632	386 Business support services	100	100	4,616,592
Platinum One	1,993,949	2,123,525	36 Construction of other new nonresidential structures	50	0	0
			39 Maintenance and repair construction of nonresidential structures	50	0	0
Mark Dunning	1,189,969	1,267,299	390 Waste management and	100	100	1,305,317

[26] 2011 contracting figures are estimated based on post population projections at Fort Lee. It is assumed that amount of contracting will increase in proportional to post population change.

Industries			remediation services			
BP Short	894,669	952,809	36 Construction of other new nonresidential structures	50	100	490,696
			39 Maintenance and repair construction of nonresidential structures	50	100	490,696
Total	**78,070,108**	**83,143,454**				**83,450,528**

APPENDIX C: ECONOMIC IMPACTS BY SOURCES OF IMPACT

1. Military

Summary of the Impacts

Impact Type	Employment	Labor Income ($)	Output ($)	Tax ($)
Direct	4,694	267,236,624	391,472,096	n.a.
Indirect	0	0	0	n.a.
Induced	1,615	54,845,145	184,240,688	n.a.
Total	**6,309**	**322,081,769**	**575,712,784**	**25,674,615**

Top 10 industries Impacted by Employment

Industry	Employment	Labor Income ($)	Total Value Added ($)	Output ($)
Federal government, military	4,694	267,236,624	391,472,096	391,472,096
Food services and drinking places	206	3,328,709	4,937,406	10,425,367
Offices of physicians, dentists, and other health practitioners	91	6,716,188	7,806,011	11,339,348
Real estate establishments	74	1,924,787	8,891,907	11,269,876
Private hospitals	73	3,655,936	3,839,463	7,750,226
Retail Stores - General merchandise	71	1,604,484	2,388,621	3,730,148
Retail Stores - Food and beverage	61	1,388,849	2,127,640	3,375,060
Nursing and residential care facilities	50	1,548,990	1,607,654	2,150,610
Retail Stores - Motor vehicle and parts	44	1,980,768	2,474,230	3,343,487
Wholesale trade businesses	41	2,990,347	5,162,760	7,921,690

2. Basic Allowance for Housing (BAH)

Summary of the Impacts

Impact Type	Employment	Labor Income ($)	Output ($)	Tax ($)
Direct	1,015	88,113,568	129,076,632	n.a.
Indirect	0	0	0	n.a.
Induced	533	18,083,605	60,748,051	n.a.
Total	**1,547**	**106,197,173**	**189,824,683**	**8,465,464**

Top 10 industries Impacted by Employment

Industry	Employment	Labor Income ($)	Total Value Added ($)	Output ($)
Federal government, military	1,015	88,113,568	129,076,628	129,076,632
Food services and drinking places	68	1,097,546	1,627,967	3,437,464
Offices of physicians, dentists, and other health practitioners	30	2,214,470	2,573,807	3,738,824
Real estate establishments	24	634,643	2,931,849	3,715,916
Private hospitals	24	1,205,440	1,265,952	2,555,414
Retail Stores - General merchandise	23	529,032	787,579	1,229,908
Retail Stores - Food and beverage	20	457,933	701,528	1,112,829
Nursing and residential care facilities	17	510,735	530,078	709,102
Retail Stores - Motor vehicle and parts	14	653,101	815,806	1,102,418
Wholesale trade businesses	14	985,981	1,702,271	2,611,949

3. Military Spouses

Summary of the Impacts

Impact Type	Employment	Labor Income ($)	Output ($)	Tax ($)
Direct	2,618	114,941,407	271,337,538	n.a.
Indirect	478	22,316,984	68,166,756	n.a.
Induced	783	28,227,530	94,507,788	n.a.
Total	**3,879**	**165,485,921**	**434,012,082**	**24,277,449**

Top 10 industries Impacted by Employment

Industry	Employment	Labor Income ($)	Total Value Added ($)	Output ($)
Food services and drinking places	319	5,492,050	8,146,245	16,307,508
Private elementary and secondary schools	237	6,599,981	6,790,313	9,041,184
Retail Stores - General merchandise	190	4,565,521	6,796,765	4,310,430
Private hospitals	165	8,737,460	9,176,078	18,507,038
Federal government, non-military	162	17,287,818	19,637,725	16,326,419
Child day care services	138	1,972,291	3,303,107	5,289,652

Offices of physicians, dentists, and other health practitioners	136	10,639,326	12,365,749	17,375,824
Real estate establishments	131	3,642,338	16,826,448	21,598,079
Monetary authorities and depository credit intermediation activities	96	5,296,080	13,883,764	19,252,815
Employment services	91	2,522,994	2,715,989	3,444,562

4. Civilians

Summary of the Impacts

Impact Type	Employment	Labor Income ($)	Output ($)	Tax ($)
Direct	5,253	222,627,616	252,889,088	n.a.
Indirect	0	0	0	n.a.
Induced	1,346	45,690,010	153,485,940	n.a.
Total	6,599	268,317,626	406,375,028	**19,521,735**

Top 10 industries Impacted by Employment

Industry	Employment	Labor Income ($)	Total Value Added ($)	Output ($)
Federal government, non-military	5,253	222,627,616	252,889,052	252,889,088
Food services and drinking places	171	2,773,0581,795,388	4,113,219	8,685,091
Offices of physicians, dentists, and other health practitioners	76	5,595,076	6,502,978	9,446,506
Real estate establishments	61	1,603,488	7,407,608	9,388,630
Private hospitals	61	3,045,662	3,198,553	6,456,504
Retail Stores - General merchandise	59	1,336,652	1,989,895	3,107,485
Retail Stores - Food and beverage	51	1,157,013	1,772,479	2,811,671
Nursing and residential care facilities	42	1,290,422	1,339,294	1,791,615
Retail Stores - Motor vehicle and parts	37	1,650,124	2,061,215	2,785,369
Wholesale trade businesses	34	2,491,177	4,300,956	6,599,346

5. Civilian Spouses

Summary of the Impacts

Impact Type	Employment	Labor Income ($)	Output ($)	Tax ($)
Direct	1,215	55,217,938	112,431,136	n.a.
Indirect	208	9,582,809	28,797,531	n.a.
Induced	370	13,322,250	44,603,571	n.a.
Total	1,792	78,122,998	185,832,239	**10,555,299**

Top 10 industries Impacted by Employment

Industry	Employment	Labor Income ($)	Total Value Added ($)	Output ($)
Food services and drinking places	151	2,598,285	3,853,982	7,715,069
Private elementary and secondary schools	90	2,515,681	2,588,229	3,446,182
Private hospitals	74	3,915,948	4,112,527	8,294,471
State and Local Government, non-Education	73	3,785,064	4,287,097	2,951,905
Federal government, non-Military	73	7,790,189	8,849,098	7,356,967
Real estate establishments	52	1,441,753	6,660,443	8,549,206
Offices of physicians, dentists, and other health practitioners	49	3,815,511	4,434,646	6,231,376
Retail Stores - General merchandise	46	1,111,271	1,654,366	1,388,699
Construction of new nonresidential commercial and health care structures	44	2,287,957	2,602,474	7,165,705
Retail Stores - Food and beverage	43	1,040,047	1,593,294	1,364,821

6. Contractors

Summary of the Impacts

Impact Type	Employment	Labor Income ($)	Output ($)	Tax ($)
Direct	2,799	118,624,544	134,749,008	n.a.
Indirect	0	0	0	n.a.
Induced	717	24,345,390	81,783,198	n.a.
Total	**3,516**	**142,969,934**	**216,532,206**	**10,401,930**

Top 10 industries Impacted by Employment

Industry	Employment	Labor Income ($)	Total Value Added ($)	Output ($)
Federal government, non-military	2,799	118,624,544	134,748,999	134,749,008
Food services and drinking places	91	1,477,591	2,191,681	4,627,749
Offices of physicians, dentists, and other health practitioners	41	2,981,271	3,465,036	5,033,461
Real estate establishments	33	854,400	3,947,057	5,002,622
Private hospitals	33	1,622,845	1,704,312	3,440,273
Retail Stores - General merchandise	32	712,220	1,060,293	1,655,787
Retail Stores - Food and beverage	27	616,501	944,445	1,498,166
Nursing and residential care facilities	22	687,587	713,627	954,642
Retail Stores - Motor vehicle and parts	20	879,249	1,098,294	1,484,151
Wholesale trade businesses	18	1,327,395	2,291,715	3,516,385

7. Contractors' Spouses

Summary of the Impacts

Impact Type	Employment	Labor Income ($)	Output ($)	Tax ($)
Direct	636	28,633,041	58,360,571	n.a.
Indirect	108	4,992,338	14,999,454	n.a.
Induced	192	6,913,056	23,145,366	n.a.
Total	**936**	**40,538,435**	**96,505,391**	**5,417,253**

Top 10 industries Impacted by Employment

Industry	Employment	Labor Income ($)	Total Value Added ($)	Output ($)
Food services and drinking places	79	1,354,694	2,009,390	4,022,485
Private elementary and secondary schools	47	1,314,785	1,352,701	1,801,098
Private hospitals	40	2,107,562	2,213,361	4,464,081
State and Local Government, non-education	38	1,970,307	2,231,640	1,536,608
Federal government, non-	38	4,055,167	4,606,380	3,829,654

military				
Real estate establishments	27	759,237	3,507,434	4,502,069
Offices of physicians, dentists, and other health practitioners	26	2,016,596	2,343,825	3,293,444
Retail Stores - General merchandise	24	575,175	856,272	719,164
Construction of new nonresidential commercial and health care structures	23	1,195,977	1,360,384	3,745,709
Retail Stores - Food and beverage	23	550,887	843,929	715,823

8. **Students**

Summary of the Impacts

Impact Type	Employment	Labor Income ($)	Output ($)	Tax ($)
Direct	1,774	36,196,420	107,083,685	n.a.
Indirect	235	9,775,487	29,176,756	n.a.
Induced	279	9,449,999	31,761,773	n.a.
Total	**2,287**	**55,421,907**	**168,022,214**	**13,323,491**

Industries Impacted by Employment

Industry	Emp.	Labor Income ($)	Total Value Added ($)	Output ($)
Hotels and motels, including casino hotels	1,068	23,202,296	42,320,497	71,412,083
Food services and drinking places	420	6,796,910	10,081,717	21,287,614
Fitness and recreational sports centers	109	1,692,780	1,813,623	3,850,099
Retail Stores - Food and beverage	100	2,293,412	3,513,381	5,573,249
Retail Stores - Sporting goods, hobby, book and music	50	842,952	1,393,779	2,221,011
Personal care services	46	982,193	1,584,302	2,535,490
Retail Stores - Clothing and clothing accessories	37	638,613	1,309,430	1,996,390
Real estate establishments	31	800,927	3,700,031	4,689,533
Automotive repair and maintenance, except car washes	28	980,760	1,463,335	2,558,624
Services to buildings and	28	569,812	697,887	1,362,420

dwellings				

9. **Installation**

Summary of the Impacts

Impact Type	Employment	Labor Income ($)	Output ($)	Tax ($)
Direct	769	32,130,640	83,450,527	n.a.
Indirect	132	6,431,553	17,965,573	n.a.
Induced	220	7,930,488	26,554,503	n.a.
Total	**1,121**	**46,492,682**	**127,970,602**	**7,152,451**

Top 10 industries Impacted by Employment

Industry	Emp.	Labor Income ($)	Total Value Added ($)	Output ($)
Food services and drinking places	376	6,469,554	9,596,156	19,210,003
Maintenance and repair construction of nonresidential structures	273	15,644,783	16,426,870	31,215,974
Construction of other new nonresidential structures	72	3,718,955	3,934,818	10,797,538
Business support services	50	2,288,082	3,081,683	4,737,699
Architectural, engineering, and related services	31	2,534,250	2,570,870	4,188,211
Electric power generation, transmission, and distribution	20	3,570,969	13,016,096	17,805,409
Real estate establishments	17	483,918	2,235,548	2,869,503
Retail Stores - General merchandise	13	309,123	460,197	709,111
Offices of physicians, dentists, and other health practitioners	12	966,954	1,123,859	1,579,199
Employment services	12	339,242	365,192	463,156