CHAPTER ONE

ISSUE IDENTIFICATION AND ASSESSMENT OF EXISTING CONDITIONS

presented to

MADISON COUNTY COMMISSION

by

CHAMBER OF COMMERCE OF HUNTSVILLE/MADISON COUNTY

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TENNESSEE VALLEY REGIONAL GROWTH COORDINATION PLAN

DISCLAIMER

This study was prepared under contract with the Madison County Commission, Alabama, with financial support from the Office of Economic Adjustment, Department of Defense. The content does not necessarily reflect the views of the Office of Economic Adjustment.

This report is intended as an aid to planners, managers, elected officials, and other decision makers in the Tennessee Valley/Redstone Arsenal region. Our aim is not to dictate what should be done, but to assist in ongoing efforts to achieve goals and objectives identified and valued by the residents of the region. The recommendations presented in this report are suggestions for how the region could work towards those goals and objectives, based on best available information and current understandings.

The information, projections, and estimates in this report are based upon publicly available data and have been prepared using generally accepted methodologies and formulas. The projections and needs presented in this report are based upon best estimates using the available data. It is important to note that currently available information and understandings are incomplete and cannot account for the inevitable, but unpredictable, impacts of unexpected global, national, state, and/or local events. Actual results and needs may differ significantly from the projections of this report due to such unforeseen factors and conditions, as well as inaccuracy of available data, and/or factors and conditions not within the scope of this project. Persons using this information to make business and financial decisions are cautioned to examine the available data for themselves and not to rely solely on this report.

Neither the Madison County Commission, the Chamber of Commerce of Huntsville/Madison County, nor its subcontractors guarantee or warrant that the projections set forth in this report will, in fact, occur. The Madison County Commission, the Tennessee Valley Regional Growth Coordination Plan Advisory Committee and Task Forces, and the Chamber of Commerce of Huntsville/Madison County and its subcontractors disclaim any liability for any errors or inaccuracies in the information, projections, and needs analysis, regardless of how the data is used, or any decisions made or actions taken by any person in reliance upon any information and/or data furnished herein.

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EXECUTIVE SUMMARY

The **Base Realignment and Closure Commission (BRAC) 2005** will generate significant economic growth in the **Study Area**[1] over the next five years. The new missions at Redstone Arsenal (Arsenal) and the contractor jobs will require housing, create a need to educate more K-12 students, and create more demand on public and transportation services.

This Issue Identification & Assessment of Conditions Report outlines the economic and socioeconomic impacts of the Study Area over the next five years. These estimates were prepared by Taimerica Management Company (Taimerica) in early 2008 using the best and most current data available. Because of the complexity of the study and the use of secondary source data and assumptions, these estimates are subject to significant variances. The Consultant Team worked diligently to minimize errors, but cannot control the uncertainties inherent in a study of this magnitude. The reader should understand that these are the best estimates that can be prepared using the finest modeling techniques available; however, these estimates are not intended to be exact forecasts of the future. The estimates and key assumptions are given in this section of the **Tennessee Valley Regional Growth Coordination Plan (TVRGCP)**, but the technical issues related to the data, models and assumptions are captured in the Appendix of the TVRGCP. Following are the highlights of findings.

- The Study Area will witness a permanent increase of approximately 19,700 jobs as a result of new BRAC missions at the Arsenal and the corresponding Contractor Tail. About half of these jobs will be spin-off jobs outside of the contractor, military and civil service workforce. Approximately 22% of these jobs had already come to the Study Area as of January 2008, meaning that only the balance of 15,400 permanent jobs can be expected between 2008 and 2011. While the majority of new jobs will occur in the **Primary Study Area (PSA)**, about 1,350 of these jobs will be held by residents of the **Broader Impact Region (BIR)**.

- The greatest uncertainty in these estimates is due to the undetermined size of the Contractor Tail that can be expected from a BRAC move of this size and complexity. The **Contractor Tail** includes contractors who work off-base or on-base in the privately developed **Enhanced Use Lease (EUL)** area, as well as in Cummings Research Park or other business parks in the region. A best estimate, based on five different data sets, suggests that the Contractor Tail at the Arsenal will average about 1.3 jobs for every job on-base from embedded contractors or from federal civilian employees.

[1] The **Study Area** consists of thirteen counties within the Tennessee Valley and includes the **Primary Study Area (PSA)** and the **Broader Impact Region (BIR)**. The PSA includes three counties (Limestone, Madison, and Morgan) in Alabama. The BIR includes six counties (Colbert, Cullman, Jackson, Lauderdale, Lawrence, and Marshall) in Alabama and four counties (Franklin, Giles, Lawrence, and Lincoln) in Tennessee.

- Not all of the jobs will be filled by new residents. Some of the contractor and civilian jobs, based on past BRACs at the Arsenal, will be filled by military or civil service retirees who re-enter the workforce. It is estimated that about 5% of the total jobs will be filled by local hires. This figure is important for estimating future population and housing needs. The model estimates that the BRAC-related population in the Study Area will grow by 37,000 between 2005 and 2011. About 78% of this population (29,000 people) will relocate to the 13 county Study Area between 2008 and 2011. These new residents in the Study Area will occupy an estimated 10,000 housing units between 2008 and 2011.

- The BRAC process will generate about $2 billion of new construction in the Study Area over the next four years. That spending will generate about 12,000 jobs at the peak of construction in 2011. The job impacts from construction will end as construction work finishes in 2012.

- Because of the overlap between construction and permanent jobs, job growth will peak in 2010 and decline approximately 20% by 2012, topping out at a permanent job growth of about 19,700.

- The new households will bring additional K-12 students into public school systems in the Study Area. It is estimated that about 5,000 to 6,200 new students will attend regional schools, or an additional 4,000 to 4,800 increase over 2007-08 enrollment levels. Most of the new students will attend schools in Madison County.

- Water and wastewater consumption will grow with the new population. It is estimated that the demand for water will grow region-wide (Study Area) by about 5.8 million gallons per day between 2008 and 2011 (wastewater demand is estimated as 60% of water consumption).

- The addition of over $1.1 billion of new payroll in the Study Area will generate additional retail sales and sales taxes of various kinds. State sales tax revenues will grow permanently by about $15.7 million per year in the PSA. Local sales taxes in the PSA will grow permanently by about $17.6 million per year.

- State income tax revenues in Alabama resulting from BRAC are estimated at $43.4 million per year by 2011.

- Property taxes will grow with new population and commercial activity. It is estimated that state property tax will grow by $3.4 million per year in the PSA, while county property taxes in the PSA will grow by $10.9 million per year in the same year.

- School taxes will grow by about $8 million per year in the PSA between 2005 and 2011. Note that these estimates do not include commercial or personal property or vehicles. Only the increased value in real property assessments is estimated. State tax collections should exceed $69 million annually from the permanent impact of BRAC

2005. This is about twice the tax collections by counties, cities, and school districts combined.

Primary recommendations included in this Chapter of the TVRGCP are:

1. Surveys of potential contractors and further research on the Contractor Tail should be undertaken to better estimate the direct impacts likely to occur in the Study Area from the non-DoD employment.

2. The Consultant Team was unable to estimate additional capital and operating costs for public services and schools from the data at hand. Further study of these costs is needed so that accurate estimates of funding gaps can be prepared for each of the school districts, municipalities, and counties within the PSA.

BACKGROUND

The **Madison County Commission (MCC)** issued a Request for Proposal (RFP) to develop the **Tennessee Valley Regional Growth Coordination Plan (TVRGCP)**. Funding for this study was provided by the **U.S. Department of Defense (DoD)**, **Office of Economic Adjustment (OEA)** to prepare the Tennessee Valley for the impact of **Base Realignment and Closure (BRAC) 2005** at **Redstone Arsenal (Arsenal).**

The **Chamber of Commerce of Huntsville/Madison County (Chamber)** submitted a proposal in response to MCC's nationwide search for a consultant as addressed in RFP P-2007-01. This proposal identified the Chamber as the lead consultant with Wadley-Donovan GrowthTech, LLC (WDG) serving as a subcontractor. After completing a competitive bid process, MCC awarded the contract to the Chamber with a Notice-to-Proceed date of October 29, 2007.

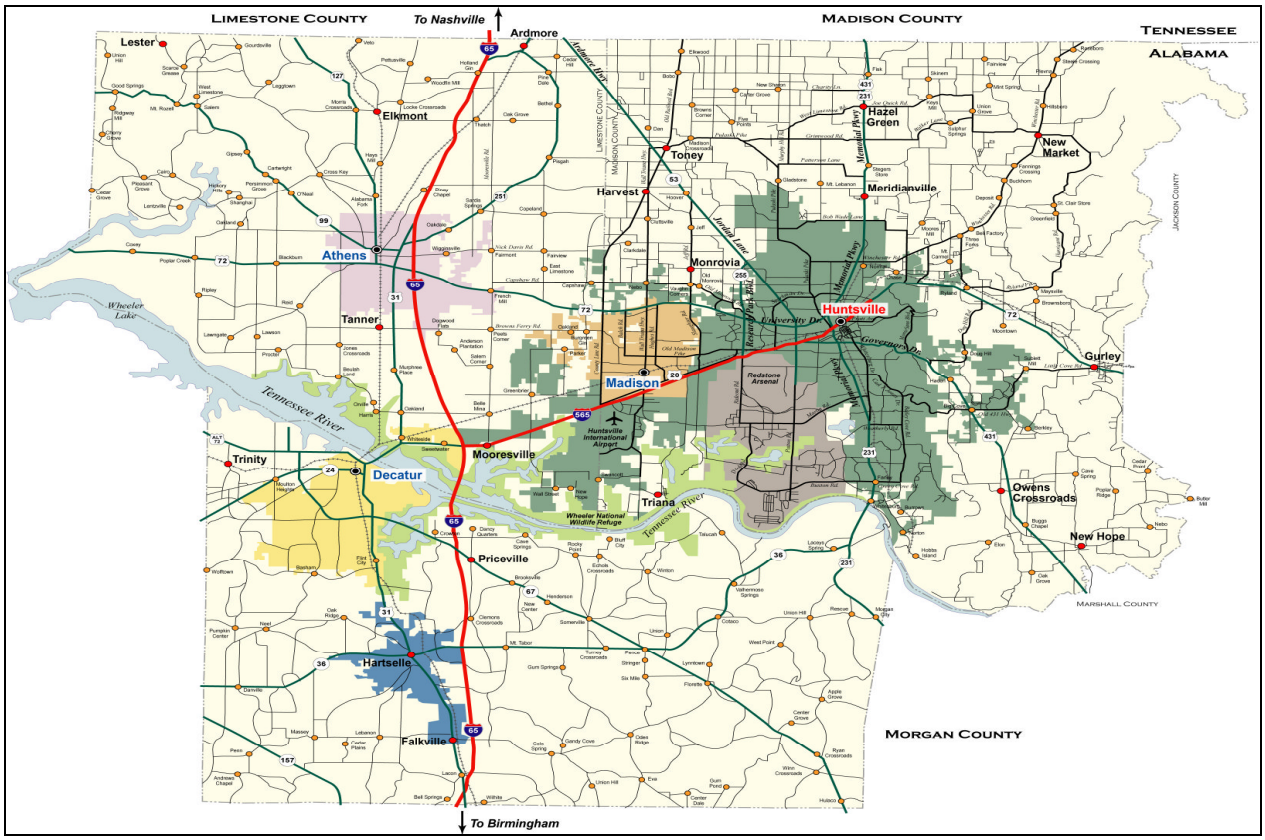
The Tennessee Valley **Study Area** for this project includes thirteen counties in northern Alabama and southern Tennessee within an eighty-mile-radius of the Arsenal. The **Primary Study Area (PSA)** includes the three Alabama counties of Limestone, Madison, and Morgan. The **Broader Impact Region (BIR)** includes the additional six counties in Alabama (Colbert, Cullman, Jackson, Lauderdale, Lawrence, and Marshall) and four counties in Tennessee (Franklin, Giles, Lawrence, and Lincoln). A map of the Study Area is shown in Figure 1-1.

Figure 1-1
Tennessee Valley Regional Growth Coordination Plan Study Area

PRIMARY STUDY AREA

The Primary Study Area (PSA) consists of three counties in Alabama, Limestone, Madison, and Morgan, surrounding Redstone Arsenal (Arsenal). Figure 1-2 shows the relationship of the Arsenal to the three counties and primary cities.

Figure 1-2
Primary Study Area



Source: City of Huntsville Planning Division and the North Central Alabama Regional Council of Governments

The PSA contains numerous incorporated areas, both large and small, as summarized below:

County	Large Municipalities	Small Municipalities
Madison	Huntsville, Madison	Gurley, New Hope, Owens Cross Roads, Triana
Limestone	Athens	Ardmore, Elkmont, Lester, Mooresville
Morgan	Decatur	Hartselle, Priceville, Trinity

The PSA includes a large amount of unincorporated area in all three of its counties. Alabama State Law allows the annexation of portions of a county by a municipality located in an adjacent county. Thus, the Cities of Huntsville, Madison, and Decatur have annexed portions of Limestone County; this is particularly the case along the I-565/Alabama Highway 20 corridor in the vicinity of I-65 (although this is not the only location).

PURPOSE

The purpose of this chapter of the TVRGCP is to review and analyze background data germane to the BRAC 2005 buildup to provide an inventory of existing conditions and growth influences in the Study Area, with particular reference to the Primary Study Area. Upon this background understanding of the region's "normal" development conditions and trends, the additional direct, indirect and induced impacts of the influx of people and activities to the area caused by BRAC 2005 is then assessed. While particular attention is paid to the 2007 – 2011 period during which the majority of BRAC moves to the region will occur, some impacts are longer ranging and are discussed where appropriate.

METHODOLOGY

The research and analysis in this Chapter is complex and explained in more detail throughout the analysis to assist the reader in understanding the process used to arrive at the conclusions presented. In more general terms, this Chapter was prepared using the following methods:

- Detailed information was obtained from Redstone Arsenal on anticipated unit and personnel arrivals, personnel counts and timing, as well as information on current conditions or those that existed prior to BRAC 2005.

- All previous and relevant reports prepared by other sources were obtained and reviewed.

- Reports and analyses of other BRAC or similar relocations from across the country were obtained and reviewed.

- Selected interviews were conducted with Arsenal representatives or other individuals.

- A combination of standard statistical analysis tools and proprietary methods developed by Taimerica Management Company were used to evaluate collected data and make initial forecasts.

- These forecasts were reviewed with the TVRGCP Advisory Committee and necessary revisions to assumptions and conclusions were made.

- Final forecasts of the impacts of BRAC 2005 on the PSA were prepared and form the basis of this Chapter.

INTRODUCTION

The Base Realignment and Closure Commission (BRAC) 2005 will generate significant economic growth in the thirteen-county Study Area within the Tennessee Valley over the next five years. New BRAC related missions at Redstone Arsenal (Arsenal), coupled with a significant buildup among private sector contractors, will stimulate a significant jump in regional jobs, income and population[2]. This expansion will also generate demand for more housing, will produce more K-12 students and traffic, and will create more demands on public services. This report details the findings about these impacts. This report does not estimate all of the regional growth that is expected over the period of the BRAC buildup, nor does it estimate all of the potential growth anticipated at the Arsenal. The fiscal and economic impacts are strictly those estimated for the relocation of the BRAC 2005 related movements.

This report models BRAC 2005 impacts as of January 2008. The actual number of jobs generated at the Arsenal could increase from the repositioning of units and personnel by various commands subsequent to these BRAC moves. These changes, which could have a significant impact on the Tennessee Valley, are beyond the scope of this study.

Economic impact numbers are specific to a particular geographic area. These numbers, estimated for a thirteen-county Study Area in Alabama and Tennessee, are not comparable to those for previous impact studies. The study by the Center for Business and Economic Research (CBER) at the University of Alabama modeled the economic impacts for four counties and for the State of Alabama; therefore the numbers in this report differ. Readers should not try to reconcile the two reports because of this. The differences in impact estimates are a normal outcome for studies with different geographic scopes.

ORGANIZATION OF THE REPORT

The Consultant Team organized this report so that it presents findings in a non-technical format. The mechanics of the data sources, key assumptions, and mathematical techniques are covered in the Appendix that accompanies this report. Key assumptions are stated in tabular form whenever required for an interpretation of findings.

Because of the use of secondary source data and assumptions, this analysis is subject to significant possible variances. The Consultant Team worked aggressively to minimize the potential for error, but cannot control the uncertainties involved in a project of this complexity. These numbers are best estimates rather than precise forecasts of the future. This is the nature of forecasting in the social sciences. The Consultant Team discusses this in a

[2] This report only estimates the BRAC related impacts of these commands: Army Materiel Command (AMC), Aviation Technical Test Center (ATTC), US Army Security Assistance Command (USASAC), Space & Missile Defense Command (SMDC), Second Recruiting Brigade, and Missile Defense Agency (MDA). Other announced moves into Redstone Arsenal are excluded.

later section of the report that provides additional insights regarding the Defense Contractor Tail that will accompany the Arsenal moves.

Because the Study Area was expanded to include Lawrence County, Alabama after the majority of the model was completed, some of the county level estimates do not total to regional estimates. However, the differentials are within .01%.

This report presents the socioeconomic and fiscal impacts for 2011, when the permanent impacts of BRAC 2005 are complete. The Consultant Team used this method of presentation because all the impacts for other years are a percentage of the peak year. **All estimates in this model are based on the gross direct employment by year supplied by the Arsenal.** The peak numbers are presented in each of the report tables. Readers can calculate annual estimates, if needed, based on Table 1-1. (The employment numbers supplied by the Arsenal are included in Table 1-26 in the Appendix.)

Table 1-1

Year	Cum. Pct. of Permanent Impact
Prior to 2008	22
Dec. 2008	37
Dec. 2009	43
Dec. 2010	87
Dec. 2011 and beyond	100

Source: Taimerica Management Company
Note: All data, estimates, and projections are subject to variation.

BASELINE ESTIMATES

Population estimates for each of the counties in the Study Area are available from the Centers for Business and Economic Research (CBERs) at the University of Alabama and the University of Tennessee. Employment projections at the county level are not available in either state from government sources, but projections are available from Claritas, a private data supplier.

Baseline projections of population based on trend lines of historic growth suggest that the PSA will grow about 1% per year, while job growth will average about 0.6% per year (see Table 1-2). Growth in the BIR is more modest averaging about 0.4% per year in both population and employment. (These figures are derived by dividing the total growth rate shown by 5, the number of years considered.) However, this data does not include the stimulus from the BRAC relocations in 2008 through 2011.

Table 1-2
Baseline Growth Rates in PSA and BIR

	Population		Jobs		2007-2012 Growth		2007-2012 Growth Rate (%)	
Study Area/County	**2007**	**2012**	**2007**	**2012**	**Pop.**	**Jobs**	**Pop.**	**Jobs**
Primary Study Area								
Limestone, AL	71,982	76,400	35,573	36,735	4,418	1,162	6	3
Madison, AL	304,756	323,298	161,066	167,523	18,542	6,457	6	4
Morgan, AL	114,637	117,050	55,117	55,777	2,413	660	2	1
Total PSA	**491,375**	**516,748**	**251,756**	**260,035**	**25,373**	**8,279**	**5**	**3**
Broader Impact Region								
Giles, TN	29,275	29,147	12,600	14,335	-128	1,735	0	14
Franklin, TN	41,464	42,943	19,330	19,916	1,479	586	4	3
Lawrence, TN	41,477	42,567	15,140	18,774	1,090	3,634	3	24
Lincoln, TN	32,779	33,833	16,330	16,593	1,054	263	3	2
Colbert, AL	54,630	54,334	24,570	23,999	-296	-571	-1	-2
Cullman, AL	80,823	83,230	38,336	39,022	2,407	686	3	2
Jackson, AL	53,541	53,150	25,905	25,498	-391	-407	-1	-2
Lauderdale, AL	87,939	88,029	41,544	40,482	90	-1,062	0	-3
Lawrence, AL	NA	NA	NA	NA	NA	NA	NA	NA
Marshall, AL	86,784	89,974	40,212	40,218	3,190	6	4	0
Total BIR	**508,712**	**517,207**	**233,967**	**238,837**	**8,495**	**4,870**	**2**	**2**

Sources: Claritas for population and 2012 jobs; AL and TN Labor Depts. for 2007 jobs. All data, estimates, and projections are subject to variation.

These projections are conservative because of the economic diversification occurring in the region. Economic growth accelerated starting in 2004, prior to the BRAC 2005 announcement, led by a diverse range of companies not associated with BRAC or defense and space industries (see Table 1-3).

Table 1-3
Company Locations Since 2004

Company	Year	Announced Jobs	Industry
Cinram	2004	950	DC/DVD replication
Kohler	2004	200	Plumbing products
LG Electronics	2004	350	Electronics refurbishing
Toyota Motor	2004	300	Auto engines
Direct TV	2004	1,000	Teleservice
West Corp.	2004	300	Teleservice
Hudson-Alpha	2005	1,065	Biotechnology
International Diesel	2006	125	Auto engines
Verizon	2006	1,300	Teleservices
Palco Telecomm	2007	150	Electronic equipment
Sanmina-SCI	2007	1,000	Electronic computers
Comcast	2007	200	Cable networks
DRS Test	2007	200	Electronic components
Total	**2004-2007**	**7,140**	

Source: Taimerica Management Company
Note: All data, estimates, and projections are subject to variation.

This growth is apparent in employment totals for the PSA produced by the Bureau of Labor Statistics. Rather than experiencing historic employment growth rates of 1% a year, annual employment growth rates in the PSA jumped to 1.6% beginning in 2004 and have accelerated to 2.8 - 3.0% with the beginning of BRAC movements into the Study Area.

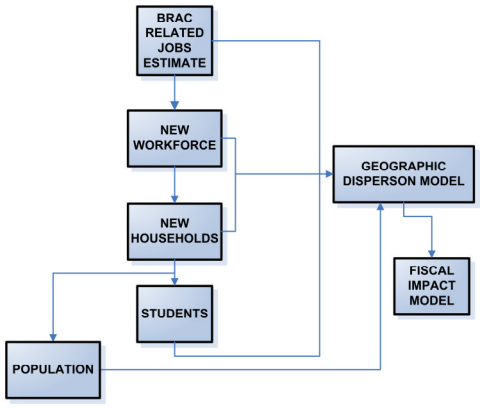
The population projections produced by CBER for the PSA prior to BRAC suggest that population in the PSA will grow by about 20,000 between 2007 and 2011. For facility planning purposes, this "organic" growth should be added to BRAC growth calculations, which will be discussed further in the "Combined Estimates" section later in this report.

ABOUT IMPACT MODELS

Impact models are built on the well-documented fact that dollars attracted to a region circulate among businesses and consumers in that region many times in business-to-business transactions or in consumer purchases before depleting themselves. In other words, new payroll dollars or business purchases for the supplies and inputs needed to run a business multiply themselves among the region's business base. Input-output models capture these multiplier relationships, which vary from industry-to-industry. The multipliers also vary from region-to-region because some regions, typically those that are larger, supply a larger share of the total inputs needed by a business and therefore exhibit higher multiplier effects. The most critical component of an impact model is these multipliers. A flowchart of the impact modeling and estimating process is in Figure 1-3.

Figure 1-3

Note: margin of error in estimates increases with the number of steps involved in a calculation. In other words, BRAC jobs estimates have the lowest margin of error and student populations have the largest.



Source: Taimerica Management Company

The model for this study uses RIMS II multipliers furnished by the U.S. Department of Commerce. These multipliers are specific to the three counties in the PSA and the thirteen counties in the Study Area. The Consultant Team chose this particular source for multipliers because these multipliers are based on the specific economic structure of the region rather than on the national input-output tables. For example, past research by members of the Consultant Team suggested that the RIMS II multipliers provided a better estimate of future impacts in the auto assembly industry than the econometric models produced from national data. Using data specific to a region of interest will provide a better estimate than more generic econometric methods for the case of the BRAC moves at the Arsenal.

Impact models compute three types of impacts:

1. The first impact is termed "Direct Effects," which consists of the payroll and operating budgets added to the regional economy as a result of the BRAC moves. In the case of the Study Area's BRAC, these direct effects consist of the net new military and civilian payrolls at the Arsenal, the operating expenses for its new missions, and the payrolls and operating expenses for contractor operations that will invest in the region as a result of these new commands.

2. The second impact is termed "Indirect Effects," which involves all of the business-to-business purchases that these new commands and contractors make within the geographic boundaries of the Tennessee Valley.

3. The third impact is termed "Induced Impacts," which consists of the consumer purchases made as a result of the new payrolls added to the Study Area resulting from the BRAC process.

The Total Impact consists of the combination of these three different levels of spending in the Study Area. In other words:

Total Impact = Direct Effects + Indirect Effects+ Induced Impacts

Figures on the total impact are used to compute most of the other impacts such as population growth, housing demand, and the other socioeconomic and fiscal impacts from BRAC.

MODEL COMPONENTS AND DESIGN

This model has five interconnected sub-models (see Figure 1-3 for an illustration of the sequence of calculations in the model). The modeling process began with estimates of the total economic impacts from the Tennessee Valley BRAC. These impacts consist of annual estimates for the construction phase (see Figure 1-8 in the Appendix), followed by annual estimates for the permanent operations from the new BRAC missions and expanded contractor services.

Outputs from that economic impact sub-model then entered a Skill Needs sub-model (see Figure 1-9 in the Appendix) that estimated the skill requirements of the new workforce and determined the number of jobs that could be filled by persons already living in the Study Area. From that sub-model, the Consultant Team then estimated the number of new households, new residents, and the overall socioeconomic impacts from BRAC. The next sub-model estimated the share of impacts that would occur in each of the Study Area's 13 counties and provides more precise geographic estimates of impacts for the three counties in the PSA (see Figure 1-10 in the Appendix). Those estimates were combined with inputs from the Fiscal Impact Model to estimate revenue and costs of services for cities and counties in the PSA.

The Consultant Team was fortunate to have current data for modeling the geographic distribution of impacts. The analysts prepared equations for the geographic distribution model from the zip codes of over 9,000 workers on the Army's Arsenal payroll. This provided a statistically valid, up-to-date data set for modeling the attractiveness of each of the Study Area's zip codes for the new residents that BRAC will bring to the area. This dataset provided a statistically sound tool for the geographic distribution of estimating these geographic impacts. The geographic model was accurate in explaining 88% of the residential variation in the Army workforce.

Modeling the Contractor Tail

A big share of the economic impact from the Arsenal's BRAC stems from the contractors that accompany the new commands, but are not located in Arsenal space. Unlike the military and civilian payroll associated with BRAC, the Contractor Tail is not precisely defined. The Contractor Tail is important in economic modeling because it has similar economic impact characteristics to the other direct jobs created at the Arsenal through the BRAC moves.

In DoD parlance, contractors consist of two varieties. The first type of contractor is termed "embedded." These have operations in Army-supplied space on-base. These contractor jobs can be estimated accurately. The second and more difficult type of contractor to model are those in the Contractor Tail. These are contractors who work off-base or in privately developed space on-base under an "enhanced use lease" (now under design at the Arsenal).

The Consultant Team looked at six sources of data in making estimates of the Contractor Tail at the Arsenal.

1. BRAC 1995 provides some idea of the potential for Contractor Tail employment. That movement resulted in approximately one new Contractor Tail job for every new Arsenal job according to the Chamber of Commerce of Huntsville/Madison County, University of Alabama – Huntsville, and other institutions involved in planning for that move.

2. Planners in Maryland use a ratio of two contractor jobs for every federal job, although the ratio is anecdotal and not supported by hard data.

3. A study of Contractor Tail jobs in Maryland for BRAC 2005 estimated that the ratio of Contractor Tail jobs is 0.5 for every direct new job on base.

4. Arlington, Virginia's experience in BRAC 1995 is similar in terms of types of contractor jobs to the Arsenal's BRAC 2005 expectations and provides some insight. The movement of the Naval Sea Systems Command from 1.2 million square feet of leased office space in Arlington resulted in one million square feet of space vacated by contractors. Since both groups tend to have the same density of employees, this suggests a ratio of 0.85 contractor jobs for every federal job.

5. The analysts evaluated the ratio of professional/technical jobs to federal civilian jobs in eleven metro areas with major commands (see Table 1-4). Communities were identified that had a large count of federal workers and also have large federal procurement operations. These ratios range between 1.3 to 2.2 professional/technical jobs to every federal civilian job. Based on project experience, the communities with high ratios, such as Colorado Springs, have large software industries that are independent of federal contracts, which set the upper limits on estimating.

6. The findings of the 2007 economic impact report for the Aberdeen Proving Ground[3] estimated the Contractor Tail for Aberdeen between .83 and 1.11 Contractor Tail jobs for every on-base job (note that the on-base figure includes both federal and embedded contractors).

Table 1-4
Ratio of Military to Civilian Jobs by Type for Selected Metros

Area Name	2005 DoD Proc. ($M)	Jobs in 2005				Civilian (% Total)	Ratio of Prof/ Tech to Civilian
		Military	Federal Civilian	Prof-Tech	Total		
Washington-Arlington-Alexandria	24,200	77,009	358,220	549,910	**3,740,059**	9.6	1.54
Redstone Arsenal - Huntsville, AL	4,790	3,384	15,484	33,531	**245,951**	6.3	2.17
Fort Walton Beach-Crestview-Destin, FL	1,060	15,785	6,799	8,427	**127,138**	5.3	1.24
Honolulu, HI	1,800	49,918	28,860	34,413	**604,455**	4.8	1.19
Virginia Beach-Norfolk-Newport News, VA-NC	5,500	108,342	46,500	59,841	**1,020,439**	4.6	1.29
Baltimore-Towson, MD	1,230	24,217	71,963	144,331	**1,638,935**	4.4	2.01
Dayton, OH	1,364	7,837	17,272	29,500	**506,327**	3.4	1.71
Montgomery, AL	330	5,760	6,701	11,119	**221,234**	3.0	1.66
Pensacola-Ferry Pass-Brent, FL	726	12,510	6,732	11,405	**225,572**	3.0	1.69
Albuquerque, NM	716	6,201	14,226	43,965	**484,299**	2.9	3.09
Colorado Springs, CO	1,950	31,720	10,686	30,155	**366,089**	2.9	2.82

Source: Procurements from Consolidated Federal Funds Report, Employment from Bureau of Economic Analysis – REIS.
Note: All data, estimates, and projections are subject to variation.

[3] Sage Policy Group "Aberdeen Proving Ground BRAC Impacts on Seven Jurisdictions" Sept. 2007

Based on these evaluations, the Consultant Team determined that a figure of 1.3 Contractor Tail jobs for every federal civilian job is the best estimate of the Contractor Tail effect. This ratio is above the BRAC 1995 experience at the Arsenal, but fits the Aberdeen experience. It is consistent with the ratios for Huntsville and other Metropolitan Statistical Areas (MSAs) with major commands, giving some allowance to the share of professional/technical jobs that are not connected to federal activity. This ratio is also consistent with the ratios computed from the study of the contractor community in Huntsville by the University of Alabama – Huntsville (UAHuntsville) in 2003.

MODEL ESTIMATES

Two goals need to be achieved in this model. First, an accurate estimate of the regional effects of BRAC is needed; however, economic growth in the Tennessee Valley is ongoing. New economic activity is consistently happening outside the Arsenal. This creates the need for a second goal, which is to estimate the future size of the regional economy including the effects of BRAC 2005. The second goal gives community leaders the data needed to plan infrastructure for future growth. The Consultant Team achieved these goals by presenting a baseline estimate of growth and then adding the estimated effects from BRAC 2005.

BRAC Estimates

The estimate of BRAC-induced growth in the 13 county Study Area started with estimates of job growth by year. The impacts consist of two components:

1. Growth from construction; and
2. Growth from permanent operations.

The overall impact consists of both these impacts.

Construction Jobs Impacts

Construction spending creates new jobs in a region, both in the construction trades and in the general economy (often called spin-off jobs in impact reports). Construction spending will increase in the Tennessee Valley from not only projects at the Arsenal, but from the construction of new office space for the Contractor Tail jobs. The new population in the Study Area creates a demand for new housing, retail space, infrastructure, and commercial space. All of this construction activity creates jobs and economic activity during the time that construction projects are underway. The total impacts from construction can be estimated using jobs multipliers.

Direct spending on new construction determines the economic impacts from construction. Construction spending at the Arsenal is budgeted at $415 million. Most of the spending, hence the impact, will occur in 2008 - 2010. Construction at the Arsenal will end by 2011.

The Consultant Team estimated construction spending for new commercial office space using national ratios and the estimates of contractor jobs. Based on an average ratio of 230 square feet per worker (extracted from the Aberdeen impact report), it is estimated that 1.25 million square feet of office space will be needed. That quantity of space will generate approximately $150 million in new construction.

Residential construction is a big share of the new construction activity from BRAC. The models estimate that about 10,000 total housing units are needed to support the added population attracted to the region by BRAC jobs subsequent to 2007. Residential construction will consist of a mixture of single family houses, apartments, and condominiums. The most recent cost per unit of $108,000, reported by the Construction Section of the U.S. Census Bureau for the PSA, was used to estimate this component of construction. This figure is below the value of new single-family housing in the Study Area because of the mixture of units and the lack of land costs in the calculations. Table 1-5 summarizes the construction estimates for the entire Study Area. BRAC will generate about $500 million/year of new construction in the thirteen-county area over the next four years.

Table 1-5
Construction Impacts from BRAC in the 13 County Study Area

Type of Project	Amount ($M)	Years
Redstone Arsenal construction projects	415	4
Office space construction (1.25 MM sf)	150	4
Residential construction	1,133	4
Other commercial construction	366	4
Total	**2,039**	**NA**

Source: Taimerica Management Company
Note: All data, estimates, and projections are subject to variation.

The estimated jobs in construction trades and the related spin-off jobs from construction are shown in Table 1-6.

Table 1-6
Construction Phase Jobs in the PSA and the BIR by Year

	2008	2009	2010	2011	2012
Construction jobs within PSA	3,423	4,568	6,620	1,534	0
Total jobs with spin-offs within PSA	6,199	8,272	11,989	2,779	0
Jobs outside the PSA but within the BIR	69	92	134	31	0

Source: Taimerica Management Company
Note: All data, estimates, and projections are subject to variation.

Job growth from construction will peak in 2010 and drop to zero (for the purposes of this study) when construction is completed at the end of 2011.

Construction Population

A significant number of construction workers already live within the Study Area. Employment in construction in the PSA averaged over 12,000 during 2007. Peak construction employment from BRAC growth is estimated at 6,000 in 2010. Unlike other sectors of the economy, construction jobs are project specific and subject to significant annual variability. Depending on interest rates and overall level of construction activity, most of the construction jobs can be filled through local hires in the Study Area which won't lead to population increases. Even those construction jobs that are filled by outsiders have less impact on population and housing levels than permanent jobs. Because of the temporary nature of construction jobs, workers look for temporary housing (short-term rentals or motels) or commute to their job sites. Workers living in temporary housing typically live without family and return home on weekends. As a result of these conditions, the population impacts from construction have not been modeled. Construction will lead to tighter rental markets and higher motel occupancy rates throughout the Study Area, but will have a lesser impact on housing construction and population-driven-services than what is expected from the permanent economic impacts of BRAC.

Permanent Jobs Impacts

The estimated jobs impacts of BRAC on the PSA and BIR are reported in Table 1-7.

Table 1-7
Permanent Jobs in the PSA and the BIR
(Cumulative Jobs by Year)

	2007	2008	2009	2010	2011	2012
Direct jobs	2,248	3,607	4,315	8,542	10,218	10,218
Indirect and induced jobs	2,088	3,350	4,013	7,940	9,519	9,519
Total jobs, Study Area	**4,336**	**6,956**	**8,328**	**16,481**	**19,737**	**19,737**
Total jobs outside the PSA	**NA**	**474**	**572**	**1,141**	**1,353**	**1,353**
Total jobs in the PSA	**4,336**	**6,482**	**7,756**	**15,340**	**18,384**	**18,384**

Source: Taimerica Management Company
Note: All data, estimates, and projections are subject to variation.

Permanent jobs from BRAC 2005 will grow through 2011. When the BRAC moves are complete, the Study Area will have approximately 19,700 additional jobs from its impact. The economic impact of BRAC 2005 extends outside the PSA as shown in Table 1-7. About 1,353 of the total new jobs will be held by residents living outside the PSA's three counties.

Socioeconomic Impact

Not all of the positions created by BRAC 2005 will be filled by new residents. Some positions in the contractor and civilian workforce will be filled by military or civilian retirees who re-enter the workforce to take new assignments they find challenging and financially rewarding. The Redstone Garrison has estimated that about 10% of work will be filled by

retirees who often retire in their early 50s. The large number of military retirees in the Tennessee Valley is a significant resource for filling these jobs.

Some of the new jobs will be filled by recent college graduates or by workers who switch employers to pursue opportunities for career advancement. All of these factors have to be taken into account when projecting population levels.

After a careful examination of the labor-force dynamics (see Table 1-20 in the Appendix) and by reviewing the labor force assessment completed by the Wadley Donovan Group (WDG) in 2007, it can be concluded that about 95% of the total workforce as of result of BRAC 2005 will be new to the region. WDG's employer interviews and household surveys suggested that the local labor market was extremely tight in engineering and computer sciences, as well as in blue-collar trades, office occupations, and unskilled occupations.

All of the churn in the labor market from a large project like BRAC 2005 can be accounted for by looking at the ratio of population to employment in a region. A ratio was developed based on Bureau of the Census population estimates for the PSA counties for 2006, divided by employment levels in the same year, to arrive at a ratio of 1.99 people per job. The socioeconomic estimates in this report are based on this method assuming that 5% of jobs will be filled by current residents of the Study Area (see Table 1-8).

Employment figures supplied by the Arsenal indicate that 22% of the BRAC jobs have already been filled as of January 1, 2008; therefore 78% of the BRAC-related growth in population, and the related impacts on housing, school enrollments, and other socioeconomic impacts will occur between 2008 and 2011. The socioeconomic estimates suggest a need for about 10,000 housing units between 2008 and 2011. Population will increase by an additional 29,000 in the Study Area, while the region will add another 4,000 to 4,800 public school students, bringing the total impact from BRAC (from 2005 to 2011) to 5,000 to 6,200 students (see Table 1-8), depending on the method of estimation used.

New Households

The socioeconomic model suggests that the BRAC process will attract 13,000 households to the 13 county Study Area between 2005-2011 (see Table 1-8). About 22% of those households were already located in the Study Area at the beginning of 2008, meaning an additional 10,000 will relocate to the area between 2008–2011, leading to the absorption of an additional 10,000 housing units. This estimate assumes that households have 1.48 workers each, the current average for PSA households excluding those headed by persons 65 and older.

New School Students

The Consultant Team calculated the number of school students using three different methods. The number of students was estimated using the proportion of population in the Study Area

of school age (5 to 18), the number enrolled per household, and as a ratio of the working-age population (this method assumes that school students live in households where the head of household is between 21 to 65 years old). A recap of the estimates is shown in Table 1-8. Each of the methods provides a similar estimate: between 5,000 and 6,200 new students in K-12 schools. About 4,000 to 4,800 of these students were not enrolled in regional schools in the 2007-08 school year. The Consultant Team used the estimates from the "enrollment per household" method, the middle figure, in the Fiscal Impact calculations. This is the same method used by EMCS in their study of student growth for Madison County Schools.

Table 1-8
Summary of Socioeconomic Impacts from BRAC in the 13 County Study Area

Jobs by Category	**2005-2007**	**2008-2011**	**2005-2011**
Military jobs	102	362	464
Civilian jobs	933	3,308	4,241
Contractors jobs	1,213	4,300	5,513
Indirect & induced jobs	2,094	7,425	9,519
Total jobs	**4,342**	**15,395**	**19,737**
Socioeconomic Ratios	**2005-2007**	**2008-2011**	**2005-2011**
Workers/household	1.48	1.48	1.48
Persons/household	2.68	2.68	2.68
Population/employment ratio	1.99	1.99	1.99
Impact jobs held by new residents	95%	95%	95%
Primary Socioeconomic Estimates	**2005-2007**	**2008-2011**	**2005-2011**
Permanent workforce from outside region	4,125	14,625	18,750
New households/housing units needed	2,787	9,882	12,669
New population	8,218	29,104	37,322
New Public School Students by Method	**2005-2007**	**2008-2011**	**2005-2011**
Percent of population	1,315	4,657	5,972
Enrollment/household	1,115	3,953	5,068
As share of working age population	1,362	4,826	6,188
Other Socioeconomic Variables	**2005-2007**	**2008-2011**	**2005-2011**
New vehicle trips/day into PSA (@5.5/new commuter)	2,382	8,446	10,828
New vehicle trips/day into Madison County @ 5.5/new commuter	5,263	18,662	23,925
Airport boardings (based on 2005 per capitas)	9,862	34,925	44,787
Municipal water/wastewater consumption (@ 200 gpd)	1,643,609	5,820,865	7,464,474

Source: Taimerica Management Company
Note: All data, estimates, and projections are subject to variation. See Figure 1-2 for a flowchart showing the sequence of these estimates.

Other Socioeconomic Estimates

Estimates of commuter vehicle trips, airport boardings, retail sales, and water consumption were also prepared from per capita figures (see Table 1-8).

Occupational/Training Estimates

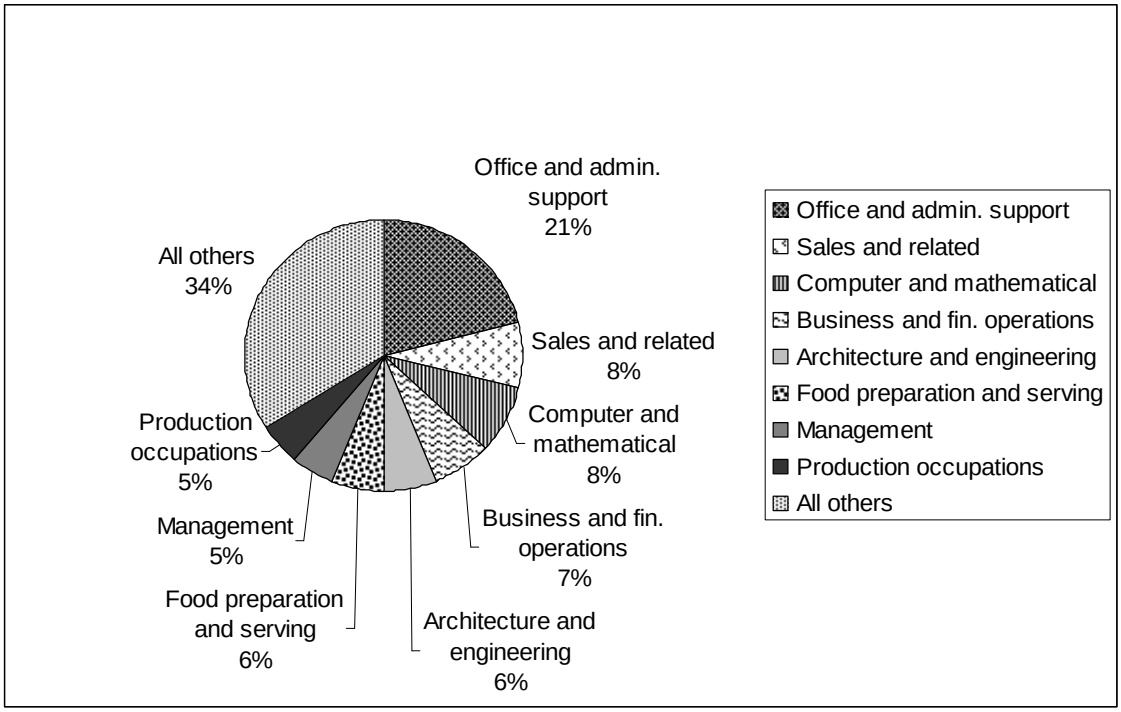
An important advantage of the Consultant Team's impact model is the ability to project the skills required by the BRAC process. The occupational requirements can be estimated for the contractor and spin-off workforce. Table 1-9 provides an estimate of the number of jobs within the most common occupations. Figure 1-4 shows the distribution of jobs by occupational category.

Table 1-9
Redstone Arsenal BRAC
Most Common Occupations in Contractor and Spin-off Sectors

Code	Occupational Title	Estimated Employed	% of Total
43-9061	Office clerks, general	326	2.8%
19-0000	Life, physical, and social science occupations	304	2.6%
23-1011	Lawyers	299	2.5%
13-2011	Accountants and auditors	291	2.5%
41-2031	Retail salespersons	246	2.1%
43-3031	Bookkeeping, accounting, and auditing clerks	232	2.0%
43-6014	Secretaries, except legal, medical, and executive	219	1.9%
31-0000	Healthcare support occupations	211	1.8%
43-6011	Executive secretaries and administrative assistants	209	1.8%
43-4051	Customer service representatives	197	1.7%
41-2011	Cashiers	195	1.7%
43-6012	Legal secretaries	188	1.6%
11-1021	General and operations managers	187	1.6%
15-1031	Computer software engineers, applications	172	1.5%
47-0000	Construction and extraction occupations	163	1.4%
35-3021	Combined food preparation and serving workers, including fast food	161	1.4%
37-2011	Janitors and cleaners, except maids and housekeeping cleaners	161	1.4%
13-1111	Management analysts	155	1.3%
35-3031	Waiters and waitresses	154	1.3%
43-4171	Receptionists and information clerks	150	1.3%
15-1021	Computer programmers	142	1.2%
53-7062	Laborers and freight, stock, and material movers, hand	139	1.2%
23-2011	Paralegals and legal assistants	138	1.2%
43-1011	First-line supervisors/managers of office and admin. support workers	131	1.1%
15-1051	Computer systems analysts	128	1.1%
15-1041	Computer support specialists	118	1.0%
15-1032	Computer software engineers, systems software	117	1.0%
29-1111	Registered nurses	115	1.0%
17-2051	Civil engineers	105	0.9%
33-0000	Protective service occupations	103	0.9%
13-1199	Business operations specialists, all other	100	0.8%
25-2021	Elementary school teachers, except special education	95	0.8%

Source: Taimerica Management Company
Note: All data, estimates, and projections are subject to variation.

Figure 1-4
Distribution of Jobs by Occupation

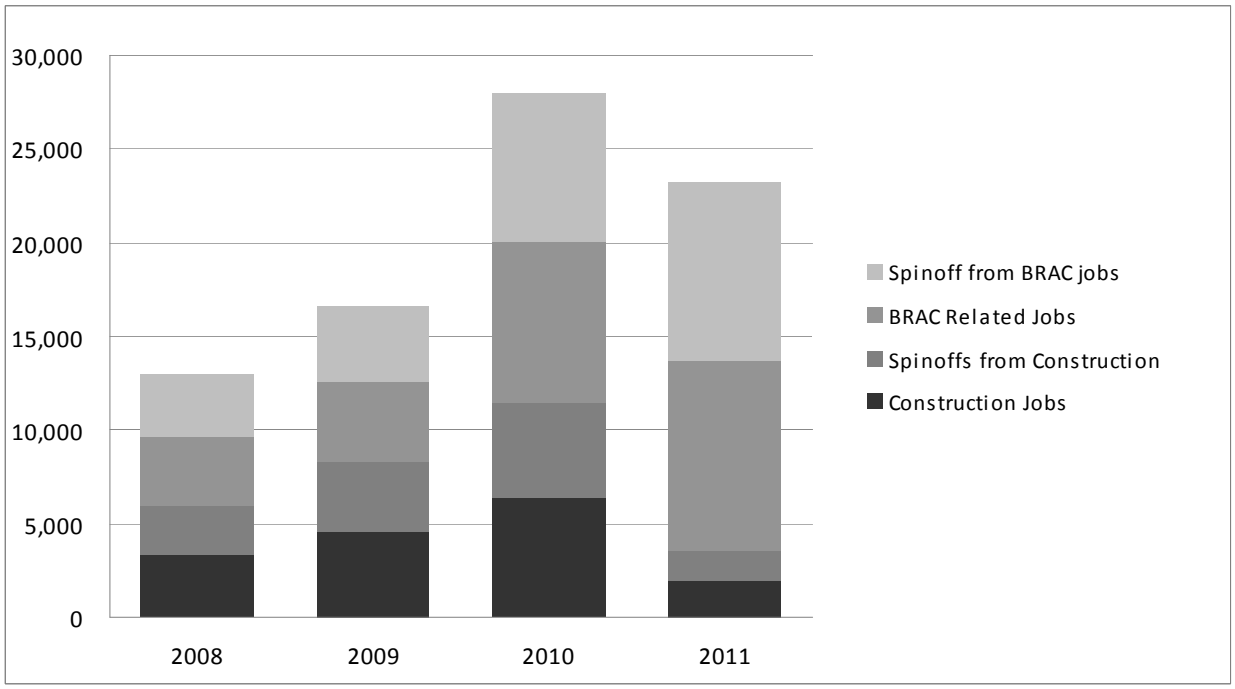


Source: Taimerica Management Company

COMBINED ESTIMATES

The combination of construction and permanent jobs will create an employment peak in 2010. Overall employment levels will diminish by 20% after the peak in the construction cycle (see Figure 1-5).

Figure 1-5
Distribution of Jobs by Type



Source: Taimerica Management Company

The BRAC impacts will accelerate regional growth and the need to make additional infrastructure investments. The combined growth in the BIR is moderate. Both jobs and population will grow about 3% in five years in the BIR counties or about 0.6% per year. However, the permanent impact in the PSA counties will be much higher (see Table 1-10). The combined growth in Madison County is expected to double as a result of BRAC. Because of the concentration of new jobs and population expected in Madison County, the combined growth rates are estimated at 3% per year from 2008 to 2012. Madison County population is likely to grow by 15% during the BRAC buildup (estimated 45,000 new residents) while combined job growth during the period is estimated at 20,700 (see Table 1-11). Limestone County will grow by 10% in population (+7,400 residents) and by 2,700 in terms of new jobs. Morgan County is projected to grow by nearly 5% (5,591 new residents) and job growth is estimated at 2,341. In summary, growth rates in the PSA, already above the national average, are expected to more than double during the BRAC expansions.

Table 1-10
Combined Estimates

	Population				Jobs			
		2012				2012		
PSA	2007	Baseline	BRAC	Combined	2007	Baseline	BRAC	Combined
Limestone	71,982	76,400	2,945	79,345	35,573	36,735	1,558	38,293
Madison	304,756	323,298	26,926	350,224	161,066	167,523	14,243	181,766
Morgan	114,637	117,050	3,178	120,228	55,117	55,777	1,681	57,458
Total PSA	**491,375**	**516,748**	**33,049**	**549,797**	**251,756**	**260,035**	**17,482**	**277,517**
Total BIR	**508,712**	**517,207**	**4,228**	**521,435**	**233,967**	**238,837**	**2,236**	**241,073**
Total Study Area	**1,000,087**	**1,033,955**	**37,277**	**1,071,232**	**233,967**	**238,837**	**19,718**	**258,555**

Source: Taimerica Management Company
Note: All data, estimates, and projections are subject to variation.

Table 1-11
Growth Estimates

	Population				Jobs		
Change	Baseline	BRAC	Combined	Ratio (% of baseline)	Baseline	BRAC	Combined
Limestone	4,418	2,945	7,363	167%	1,162	1,558	2,720
Madison	18,542	26,926	45,468	245%	6,457	14,243	20,700
Morgan	2,413	3,178	5,591	232%	660	1,681	2,341
Total PSA	**25,373**	**33,049**	**58,422**	**230%**	**8,279**	**17,482**	**25,761**
BIR	8,495	4,228	12,723	150%	4,870	2,236	7,106

Source: Taimerica Management Company
Note: All data, estimates, and projections are subject to variation.

GEOGRAPHIC ESTIMATES

The Consultant Team's model provides estimates of economic and socioeconomic impacts for each of the 13 counties in the Study Area. The Consultant Team estimated impacts by zip code within the three PSA counties where impacts are more pronounced and therefore more reliable from a modeling standpoint. These estimates were then converted into estimates for cities and unincorporated areas to estimate the fiscal impacts.

Additional information about the methodology for computing county and zip code estimates is shown in the Appendix.

Assumptions Underlying Retail Sales Estimates

The economic and socioeconomic estimates for each county are shown in Table 1-21 in the Appendix. This table shows direct jobs by residence while assuming that indirect and induced jobs are taken by residents living within a particular county.

Retail sales are based on the assumption that 40% of payroll is spent on goods and services subject to sales tax, a typical ratio. The Impact Assessment, completed by CBER at the University of Alabama in April 2007, estimated retail sales at 42.2% of payroll, but the proportion varies between Tennessee and Alabama which is why the Consultant Team opted to use the lower ratio[4]. Payroll computations are shown in Table 1-12.

Table 1-12
BRAC Payroll Calculations

Impact Type	Avg $/Year	Jobs	Total Payroll ($)
Direct jobs	80,000	10,232	818,560,000
Indirect/induced	29,850	9,486	283,158,586
Total	**NA**	**19,718**	**1,101,718,586**

Sources:
Direct jobs: from payroll calculations using GS and SES pay scales
Indirect and induced jobs: Average from occupational wage distributions for Huntsville & Decatur MSAs
Note: All data, estimates, and projections are subject to variation.

All of the socioeconomic impacts are computed based on county of residence, not county of work. Retail sales were also computed based on the county of residence of employees and the figure shown is the sales when BRAC moves are finished in 2012 (see Table 1-13).

County-Level Estimates of Socioeconomic Variables

Economic and socioeconomic estimates for each of the counties in the PSA are shown in Table 1-13.

Table 1-13
County Level Estimates for PSA

	Jobs			Socioeconomic				
County	Direct	Indirect/ Induced	Total	House-holds	Pop.	Water Consump-tion (gpd)*	Retail Sales ($)	K-12 Stud.
Limestone	800	758	1,558	1,099	2,945	589,080	34,650,568	440
Madison	7,858	6,385	14,243	10,047	26,926	5,385,278	327,693,300	4,019
Morgan	506	1,175	1,681	1,186	3,178	635,586	30,221,574	474
Total	**9,164**	**8,318**	**17,482**	**12,332**	**33,050**	**6,609,944**	**392,565,442**	**4,933**

Source: Taimerica Management Company
*Gpd=gallons per day; sewer consumption is 60% of water use
Note: All data, estimates, and projections are subject to variation.

City-Level Socioeconomic Estimates in the Primary Study Area

Zip code data was converted to estimates for cities and unincorporated areas in the PSA using overlays of zip code and city limits in the Geographic Information System (GIS). The

[4] CBER "Huntsville Area BRAC Transfers: Economic and Transportation Impact Assessment" completed for City of Huntsville, April 2007.

proportion of each zip code population within city limits was calculated in this manner. The overlay estimates were calibrated with the Census Bureau's estimates for 2006. Those proportions were then used to allocate the economic and socioeconomic impacts. The estimates are shown in Table 1-14.

Table 1-14
Socioeconomic Impacts in PSA Cities/Towns

City	Households	Population	Water (gpd)	Retail $	Students
Decatur	705	1,890	377,938	20,449,605	282
Athens	426	1,141	228,142	16,018,578	170
Elkmont	18	48	9,613	36,945	7
Eva	59	157	31,406	56,280	23
Falkville	4	12	2,314	18,914	2
Hartselle	16	44	8,828	3,618,101	7
Ardmore	52	138	27,627	521,127	21
Gurley	11	31	6,140	146,482	5
Madison	1,954	5,238	1,047,539	28,382,969	782
Owens CR	35	93	18,698	1,884,649	14
Huntsville	3,751	10,053	2,010,507	258,164,174	1,500
Total	**7,031**	**18,844**	**3,768,751**	**329,297,824**	**2,813**

Source: Taimerica Management Company
Note: All data, estimates, and projections are subject to variation.

FISCAL IMPACTS

The State of Alabama levies a tax on income earned in the state. Tennessee lacks a personal income tax. The Consultant Team's models suggest that 100% of the direct jobs and 97% of the indirect and induced jobs will be subject to Alabama income tax which equates to 98.5% of the permanent payroll ($1.09 billion). The CBER at the University of Alabama estimated in 2007 that Alabama income tax would average 4% of payroll on BRAC transfers[5]. The income tax on the total payroll produced by BRAC subject to Alabama income tax, using that ratio, is $43.4 million per year at peak employment. The CBER study estimated a state income tax of $18.2 million, but these estimates did not factor contractor jobs into the payroll and lower payroll figures were used for the direct jobs extracted.

State property and sales tax estimates for the BIR were prepared from model data (see Table 1-22 in the Appendix). It was not possible to model local and county level revenues in the BIR. The impacts of BRAC are far smaller in the BIR than in the PSA, which makes such estimates highly inaccurate. These estimates suggest that BRAC will contribute about $1.6 million of new tax revenue per year in Alabama in 2011, exclusive of state revenues generated in the PSA. State revenues in Tennessee are more modest, but still are in the $1 million per year range.

[5] Center for Business and Economic Research University of Alabama "Huntsville Area BRAC Transfers: Economic and Transportation Impact Assessment

Revenue estimates for each of the counties and incorporated cities and towns in the PSA were prepared from the model (see Table 1-15 and Table 1-23 in the Appendix).

Table 1-15
State and County Tax Revenues in PSA ($)

	Sales Tax Revenue		Property Tax Revenue				
County	**State**	**County**	**State**	**County**	**Schools***	**County Tax per Capita**	**School Tax per Student***
Limestone	1,386,023	693,011	277,739	576,843	234,790	195.85	1,909.58
Madison	13,107,732	4,915,400	2,539,078	4,296,901	2,672,051	159.58	4,115.03
Morgan	1,208,863	906,647	299,726	636,341	266,860	200.24	13,241.15
PSA Total	**15,702,618**	**6,515,058**	**3,116,543**	**5,510,085**	**3,173,701**	**166.72**	**4,004.94**

Source: Taimerica Management Company
*School taxes in unincorporated areas only
Note: All data, estimates, and projections are subject to variation.

Gasoline taxes are levied at the county and municipal level in Alabama. Table 1-16 shows estimated state fuel taxes per county for the peak year. Gasoline tax revenues in the three counties of the PSA should grow about $3.5 million.

Table 1-16
State Gasoline Tax Estimates for PSA in Peak Years 2005 - 2006

County	**Fuel Consump. (gallons)**	**Fuel Tax ($)**	**Population**	**Fuel Tax $ Per Capita**	**New Pop.**	**New Revenue ($)**
Limestone	50,609,943	8,474,252	72,446	116.97	2,945	344,487
Madison	216,521,066	36,254,813	304,307	119.14	26,926	3,207,935
Morgan	91,955,521	15,397,256	115,237	133.61	3,178	424,625
Total	**359,086,530**	**60,126,321**	**491,990**	**NA**	**33,049**	**3,977,046**

Source: Taimerica Management Company
Note: All data, estimates, and projections are subject to variation.

Lodging revenues also contribute significant revenue for state and local governments in Alabama. Lodging taxes correlate strongly with county employment. Table 1-17 shows an estimate of state lodging revenues in the peak year of 2011.

Table 1-17
State Lodging Tax Revenues
for PSA in Peak Year 2011

County	**State Revenue ($)**	**Local Revenue ($)**
Limestone	22,320.84	NA
Madison	307,625.31	NA
Morgan	27,177.96	NA
Total	**357,124.11**	NA

Source: Taimerica Management Company
Note: All data, estimates, and projections are subject to variation.

Looking at per capita taxes gives a preliminary overview of the revenues available to local governments to finance the impacts from new households and students in the region. Table 1-18 provides an estimate of city and school taxes anticipated in the peak year for municipalities in the PSA. Revenues vary significantly depending on the new population captured by each jurisdiction. Per capita revenues for counties in the PSA as well as for school districts serving unincorporated areas were shown previously in Table 1-15.

Table 1-18
Tax Revenues of Cities/Towns within PSA

City/Town	Students	Population	Muni Tax/Capita ($)*	School Tax/Student ($)
Decatur	282	1,890	703	914
Athens	170	1,141	426	972
Elkmont	7	48	160	972
Eva	23	157	-	-
Falkville	2	12	122	1,691
Hartselle	7	44	2,532	1,098
Ardmore	21	138	258	972
Gurley	5	31	206	1,555
Madison	782	5,238	484	1,555
Owens CR	14	93	606	1,555
Huntsville	1,500	10,053	1,182	2,041
Total	**2,813**	**18,844**	**873**	**1,695**

Source: Taimerica Management Company
*includes sales and property taxes
Note: All data, estimates, and projections are subject to variation.

School revenues in unincorporated areas are higher than those shown for municipal districts because of the broader tax base in counties. Per capita revenues within municipalities tend to be higher than those within unincorporated areas of the counties.

State governments generate a higher ratio of tax revenues on major economic development projects because they collect a larger variety of taxes than local governments. Table 1-19 compares the revenue estimates for state and local units of government. Note that the local tax collections were only for the PSA counties, which comprise just 88% of the total impact from BRAC. The local tax revenues are likely to be slightly higher than shown if the BIR counties were factored into the calculations.

Table 1-19
State and Local Tax Summaries ($Millions)

	State of Alabama	Local Governments (PSA Counties Only)
State Income Tax	43.4	--
Sales Taxes	18.0	17.6
Property Tax	3.4	10.9
School Tax	--	7.9
Gasoline Tax	4.0	NA
Lodging Tax	0.4	NA
Total	**69.2**	**36.4**

Source: Taimerica Management Company
NA = not estimated
Note: All data, estimates, and projections are subject to variation.

CONCLUSIONS

1. The latest round of the Base Realignment and Closure Commission (BRAC 2005) will generate significant economic growth in the thirteen counties of the Tennessee Valley region over the next five years.

2. The new missions at Redstone Arsenal and new contractor jobs represent just half of the total employment growth.

3. The region will witness an influx of new residents needed to fill these new jobs.

4. The BRAC buildup will require housing, create a need to educate more K-12 students, and create more demand on municipal and transportation services.

5. The municipal, school and county taxes on these combined payrolls will not be sufficient to pay for the new capital and operating costs incurred by governments in the region.

6. State tax levies will generate a larger revenue stream for building new infrastructure, schools and highways than local and county tax levies.

7. Governments within the impacted region will need state and federal assistance to meet the new fiscal burdens resulting from the BRAC moves.

RECOMMENDATIONS

The following are recommendations for further study to refine the accuracy of this impact:

1. Surveys of potential contractors and further research on the Contractor Tail should be undertaken to better estimate the direct impacts likely to occur in the Study Area from the non-DoD employment.

2. The Consultant Team was unable to estimate additional capital and operating costs for public services and schools from the data at hand. Further study of these costs is needed so that accurate estimates of funding gaps can be prepared for each of the school districts, municipalities, and counties within the PSA. One of the most critical issues from BRAC for local leaders is the planning of new schools. Accurate estimates of school enrollments are the underpinning of sound planning for school districts. The Consultant Team's research suggests the planning factor stipulated by the DoD of 1.6 students per family is outdated and misleading. The ratio might be appropriate for military families which have younger heads of household, but is high when used for the rest of the U.S. population including federal civilians. Focus groups conducted by the Tennessee Valley BRAC Committee suggested that the average age of new households moving to the Study Area will be lower than the average age of the current civilian workforce in the area, which means that the number of school students is likely to be higher than would be estimated

from census data for the Study Area. A study is recommended that will estimate a more accurate figure for the Tennessee Valley, including sampling civilian and military households in the region to determine the number of public school students per household by age of head of household. This data would allow communities to refine their plans for new schools, a significant infrastructure cost related to BRAC at the local level. The Consultant Team is unable to find data, even at the national level, that provides this kind of estimate. Such ratios would also be useful for other communities facing BRAC growth.

APPENDIX

Table 1-20
Computation of Labor Force Growth in the 13 County Study Area

		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
Study Area	**County**	**No. of H.S. Grads**	**Minus Entering 4-yr College**	**Minus Entering 2-yr College**	**Plus Grad. 2 yr College**	**Plus Grad. 4 yr College**	**Entering Labor Force (A-B-C+D+E)**	**AGE 55-59**	**AGE 60-64**	**Retirees per year 2005-2010 (G+H)/10**	**Net Impact to Labor Force (F)-(I)**
Primary Study Area											
	Limestone	574	158	193		805	1,028	3,375	2,789	616.4	412
	Madison	2,778	1,185	547	56	1,855	2,957	13,735	11,793	2,552.8	404
	Morgan	981	286	332	648		1,011	5,972	4,776	1,074.8	(64)
	Subtotal	**4,333**	**1,629**	**1,072**	**704**	**2,660**	4,996	**23,082**	**19,358**	**4,244.0**	**752**
Broader Impact Region											
	Colbert	513	152	162	320		519	3,233	2,793	602.6	-84
	Cullman	699	109	336	335		589	4,272	3,794	806.6	-218
	Jackson	468	57	192			219	3,229	2,799	602.8	-384
	Lauderdale	743	251	238		795	1,049	4,822	4,189	901.1	148
	Lawrence	287	64	106			117	1,981	1,582	356.3	-239
	Limestone	574	158	193		805	1,028	3,375	2,789	616.4	412
	Madison	2,778	1,185	547	56	1,855	2,957	13,735	11,793	2,552.8	404
	Marshall	740	123	342	247		522	4,591	3,955	854.6	-333
	Morgan	981	286	332	648		1,011	5,972	4,776	1,074.8	-64
	Franklin	286				100	386	2,252	1,909	416.1	-30
	Giles	316				150	466	1,784	1,444	322.8	143
	Lawrence	412			517		929	2,156	1,918	407.4	522
	Lincoln	294					294	1,773	1,633	340.6	-47
	Subtotal	**9,091**	**2,385**	**2,448**	**2,123**	**3,705**	**10,086**	**53,175**	**45,374**	**9,854.9**	**230**
Total		**13,424**	**4,014**	**3,520**	**2,827**	**6,365**	**15,082**	**76,257**	**64,732**	**14,098.9**	**982**

Source: Taimerica Management Company
Note: All data, estimates, and projections are subject to variation.

The **Study Area** consists of thirteen counties within the Tennessee Valley and includes the **Primary Study Area (PSA)** and the **Broader Impact Region (BIR)**. The PSA includes three counties (Limestone, Madison, and Morgan) in Alabama. The BIR includes six counties (Colbert, Cullman, Jackson, Lauderdale, Lawrence, and Marshall) in Alabama and four counties (Franklin, Giles, Lawrence, and Lincoln) in Tennessee.

Table 1-21
Permanent Jobs and Socioeconomic Impacts by County 2005-2011

	Jobs			Socioeconomic Impacts						
County	**Direct***	**Indirect/ Induced**	**Total**	**Households**	**Population**	**Airline Brdings**	**Retail Sales ($)**	**Commutes to PSA**	**Water Consump (gpd)**	**Students**
Primary Study Area										
Limestone	800	758	**1,558**	1,099	2,945	x	34,650,568		589,080	440
Madison	7,858	6,385	**14,243**	10,047	26,926	44,787	327,693,300		5,385,278	4,019
Morgan	506	1,175	**1,681**	1,186	3,178	x	30,221,574		635,586	474
Subtotal	**9,164**	**8,318**	**17,482**	**12,332**	**33,049**	**80,345**	**392,565,442**		**6,609,944**	**4,933**
Broader Impact Region										
Colbert	2	94	**96**	68	181	x	1,186,366	4	36,298	27
Cullman	152	175	**327**	231	618	x	6,953,511	280	123,639	92
Franklin	72	69	**141**	99	267	x	3,127,864	133	53,312	40
Giles	72	64	**136**	96	257	x	3,068,164	133	51,422	38
Jackson	74	102	**176**	124	333	x	3,585,886	136	66,546	50
Lauderdale	71	164	**235**	166	444	x	4,230,170	131	88,854	66
Lawrence	14	32	**46**	32	87	x	830,082	26	17,393	13
Lincoln	192	111	**303**	214	573	x	7,469,347	354	114,564	85
Marshall	418	311	**729**	514	1,378	x	17,089,359	771	275,635	206
Lawrence	1	46	**47**	33	89	x	581,243	2	17,771	13
Subtotal	**1,068**	**1,168**	**2,236**	**1,577**	**4,227**	**x**	**48,121,992**	**1,970**	**845,434**	**630**
Total Study Area	**10,232**	**9,486**	**19,718**	**13,909**	**37,277**	**44,787**	**440,687,435**	**1,969**	**7,455,376**	**5,564**

Source: Taimerica Management Company
*Direct jobs by place of residence rather than place of work/ indirect and induced
Residence=workplace
Note: All data, estimates, and projections are subject to variation.

The **Study Area** consists of thirteen counties within the Tennessee Valley and includes the **Primary Study Area (PSA)** and the **Broader Impact Region (BIR)**. The PSA includes three counties (Limestone, Madison, and Morgan) in Alabama. The BIR includes six counties (Colbert, Cullman, Jackson, Lauderdale, Lawrence, and Marshall) in Alabama and four counties (Franklin, Giles, Lawrence, and Lincoln) in Tennessee.

Table 1-22
State Tax Revenues in the Broader Impact Region

County	Households	Assessments ($)	Retail Sales ($)	State Tax Rates		State Tax Revenues ($)		
				Property	Sales	Property	Sales	Total
Colbert	68	2,632,930	1,186,366	6.5	4.0	17,114	47,455	**64,569**
Cullman	231	8,968,419	6,953,511	6.5	4.0	58,295	278,140	**336,435**
Franklin	99	3,867,117	3,127,864	0	7.0	-	218,951	**218,951**
Giles	96	3,729,985	3,068,164	0	7.0	-	214,771	**214,771**
Jackson	124	4,827,039	3,585,886	6.5	4.0	31,376	143,435	**174,811**
Lauderdale	166	6,445,194	4,230,170	6.5	4.0	41,894	169,207	**211,101**
Lawrence	32	1,261,612	830,082	6.5	4.0	8,200	33,203	**41,404**
Lincoln	214	8,310,187	7,469,347	0	7.0	-	522,854	**522,854**
Marshall	514	19,993,815	17,089,359	6.5	4.0	129,960	683,574	**813,534**
Lawrence	33	1,289,039	581,243	0	7.0	-	40,687	**40,687**
Alabama Total	**1,234**	**47,996,127**	**37,003,239**			**286,839**	**1,355,015**	**1,641,854**
Tennessee Total	**442**	**17,196,327**	**14,246,618**			**-**	**997,263**	**997,263**

Source: Taimerica Management Company
Note: All data, estimates, and projections are subject to variation.

The **Study Area** consists of thirteen counties within the Tennessee Valley and includes the **Primary Study Area (PSA)** and the **Broader Impact Region (BIR)**. The PSA includes three counties (Limestone, Madison, and Morgan) in Alabama. The BIR includes six counties (Colbert, Cullman, Jackson, Lauderdale, Lawrence, and Marshall) in Alabama and four counties (Franklin, Giles, Lawrence, and Lincoln) in Tennessee.

Table 1-23
Tax Revenue Estimates within City Limits

City/ Town	Categories			Tax Rates			Revenues ($)		
	Households	Retail ($)	Assessed Values ($)	P. Muni.	P. School	Sales	Muni.	School	Sales Tax
Decatur	705	20,449,605	27,414,612	18.6	9.4	4.0	509,912	257,697	817,984
Athens	426	16,018,578	16,548,794	10.0	10.0	2.0	165,488	165,488	320,372
Elkmont	18	36,945	697,318	10.0	10.0	2.0	6,973	6,973	739
Eva	59	56,280	2,283,082				-	-	-
Falkville	4	18,914	167,816	5.0	17.4	3.0	839	2,920	567
Hartselle	16	3,618,101	640,340	5.0	11.3	3.0	3,202	7,236	108,543
Ardmore	52	521,127	2,003,965	10.0	10.0	3.0	20,040	20,040	15,634
Gurley	11	146,482	445,377	6	16	2.5	2,672	7,126	3,662
Madison	1,954	28,382,969	75,985,699	24	16	2.5	1,823,657	1,215,771	709,574
Owens CR	35	1,884,649	1,356,325	7	16	2.5	9,494	21,701	47,116
Huntsville	3,751	258,164,174	145,836,770	20	21	3.5	2,843,817	3,062,572	9,035,746
Total							**5,386,094**	**4,767,525**	**11,059,938**

Source: Taimerica Management Company
Note: All data, estimates, and projections are subject to variation.

The **Study Area** consists of thirteen counties within the Tennessee Valley and includes the **Primary Study Area (PSA)** and the **Broader Impact Region (BIR)**. The PSA includes three counties (Limestone, Madison, and Morgan) in Alabama. The BIR includes six counties (Colbert, Cullman, Jackson, Lauderdale, Lawrence, and Marshall) in Alabama and four counties (Franklin, Giles, Lawrence, and Lincoln) in Tennessee.

Table 1-24
RIMS II Multipliers for Direct Jobs

Key Assumptions	Primary Study Area				Study Area			
Multipliers	Output ($)	Earnings ($)	Emp (Jobs/ $1 Million)	Emp (T Jobs/ Direct Job)	Output ($)	Earnings ($)	Emp (Jobs/ $1 Million)	Emp (T Jobs / Direct Job)
RIMS Type I (Indirect only)								
Army Materiel Command (AMC)	1.1904	0.545	9.403	1.1652	1.1933	0.4926	8.6645	1.1817
Aviation Tech Test Center (ATTC)	1.1925	0.2326	4.1873	1.4461	1.3729	0.3914	7.1077	1.4913
Security Assistance Command (USASAC)	1.1904	0.545	9.403	1.1652	1.1933	0.4926	8.6645	1.1817
Space & Missile Defense Command (SMDC)	1.1904	0.545	9.403	1.1652	1.1933	0.4926	8.6645	1.1817
Second Recruiting Brigade	1.2069	0.4869	11.9619	1.3084	1.3729	0.3914	7.1077	1.4913
Missile Defense Agency (MDA)	1.1904	0.545	9.403	1.1652	1.1933	0.4926	8.6645	1.1817
Contractors	1.2628	0.5275	9.3139	1.3491	1.2131	0.5368	11.6034	1.2304
RIMS Type II (Indirect + Induced)								
Army Materiel Command (AMC)	1.6705	0.6725	14.3077	1.773	1.6634	0.6232	13.2429	1.8062
Aviation Tech Test Center (ATTC)	1.3973	0.2869	6.2801	2.1688	1.7464	0.4951	10.7455	2.2545
Security Assistance Command (USASAC)	1.6705	0.6725	14.3077	1.773	1.6634	0.6232	13.2429	1.8062
Space & Missile Defense Command (SMDC)	1.6705	0.6725	14.3077	1.773	1.6634	0.6232	13.2429	1.8062
Second Recruiting Brigade	1.6358	0.6008	16.3438	1.7877	1.6818	0.6454	15.4118	1.887
Missile Defense Agency (MDA)	1.6705	0.6725	14.3077	1.773	1.6634	0.6232	13.2429	1.8062
Contractors	1.6715	0.6276	15.783	1.7945	1.8097	0.7075	15.0998	2.0065
Outgoing Commands	1.6715	0.6276	15.783	1.7945	1.8097	0.7075	15.0998	2.0065

Source: Taimerica Management Company
Note: All data, estimates, and projections are subject to variation.

Table 1-25
Key Assumptions

Key Assumptions	
Contractor/Fed Civilian Ratio	1.3

Direct Economic Impacts

	(in $000)					
Construction Spending	**2008**	**2009**	**2010**	**2011**	**2012**	**Total**
Army Materiel Command (AMC)	42,333	42,333	42,333			**126,999**
Aviation Tech Test Center (ATTC)		23,000	23,000			**46,000**
Security Assistance Command (USASAC)						**-**
Space & Missile Defense Command (SMDC)	-	-				**-**
Second Recruiting Brigade	4,700	4,700				**9,400**
Missile Defense Agency (MDA)	73,933	73,933	73933			**221,799**
Garrison Support (USAG-R)	11,250					**11,250**
Total	**132,216**	**143,966**	**139,266**	**-**	**-**	**415,448**

Source: Taimerica Management Company
Note: All data, estimates, and projections are subject to variation.

Table 1-26
Additional Key Assumptions

Operations Staffing	**2008**	**2009**	**2010**	**2011**	**2012**
Army Materiel Command (AMC)					
Military	25	24	27	188	188
Federal Civilian	151	166	1,315	1,154	1,154
Aviation Tech Test Center (ATTC)					
Military	22	26	45	71	71
Federal Civilian	94	109	190	302	302
Security Assistance Command (USASAC)					
Military	2	2	10	10	10
Federal Civilian	49	49	307	356	356
Space & Missile Defense Command (SMDC)					
Military	99	99	99	99	99
Federal Civilian	147	147	147	147	147
Second Recruiting Brigade					
Military	6	52	52	52	52
Federal Civilian	10	78	78	78	78
Missile Defense Agency (MDA)					
Military	21	25	32	45	45
Federal Civilian	1,043	1,229	1,561	2,203	2,203
Subtotal					
Military	**175**	**228**	**264**	**464**	**464**
Federal Civilian	**1,492**	**1,777**	**3,599**	**4,241**	**4,241**
Contractor	**1,940**	**2,310**	**4,679**	**5,513**	**5,513**
Total Incoming	**3,607**	**4,315**	**8,542**	**10,218**	**10,218**
Outgoing Commands (PM TOCS etc)	0	0	0	0	0
NET INCOMING	**3,607**	**4,315**	**8,542**	**10,218**	**10,218**

Source: Taimerica Management Company
Note: All data, estimates, and projections are subject to variation.

Table 1-27
Construction Impacts

Primary Study Area					
	2008	**2009**	**2010**	**2011**	**2012**
Construction Jobs from Arsenal Construction	1,371	1,493	1,444	0	0
Total Jobs from Arsenal Construction	**2,468**	**2,687**	**2,600**	**0**	**0**
Construction jobs from residential/commercial projects	1,917	3,046	4,860	1,927	0
Total Jobs from residential/commercial projects	**3,452**	**5,484**	**8,752**	**3,470**	**0**
CONSTRUCTION JOBS FROM ALL CONSTRUCTION	**3,288**	**4,538**	**6,304**	**1,927**	**0**
TOTAL JOBS FROM ALL CONSTRUCTION	**5,920**	**8,171**	**11,351**	**3,470**	**0**
Total Jobs held by residents of PSA	**5,186**	**7,158**	**9,944**	**3,040**	**0**
Total jobs held by residents of BIR	**734**	**1,013**	**1,408**	**430**	**0**
Broader Impact Region					
	2008	**2009**	**2010**	**2011**	**2012**
Construction Jobs	3,306	4,563	6,339	1,938	0
Total Jobs from Construction Phase	5,987	8,263	11,479	3,509	0
Net of Primary Study Area	67	92	128	39	0

Source: Taimerica Management Company
Note: All data, estimates, and projections are subject to variation.

Table 1-28
Permanent Impacts

Primary Study Area					
	2008	**2009**	**2010**	**2011**	**2012**
Output ($000)*	19,108	449,728	593,269	593,269	593,269
Payroll ($000)*	12,850	293,822	387,479	387,479	387,479
Direct Jobs**	3,607	4,315	8,542	10,218	10,218
Total Jobs**	**6,483**	**7,756**	**15,340**	**18,384**	**18,384**
Total Jobs held by residents of PSA	**5,679**	**6,794**	**13,438**	**16,105**	**16,105**
Total jobs held by residents of BIR	**804**	**962**	**1,902**	**2,280**	**2,280**
Broader Impact Region					
	2008	**2009**	**2010**	**2011**	**2012**
Output ($000)*	19,027	453,334	598,103	598,103	598,103
Payroll ($000)*	11,858	279,517	368,737	368,737	368,737
Direct Jobs	3,607	4,315	8,542	10,218	10,218
Total Jobs	**6,956**	**8,328**	**16,481**	**19,737**	**19,737**
Total Jobs net of Primary Study Area	**474**	**572**	**1,141**	**1,353**	**1,353**

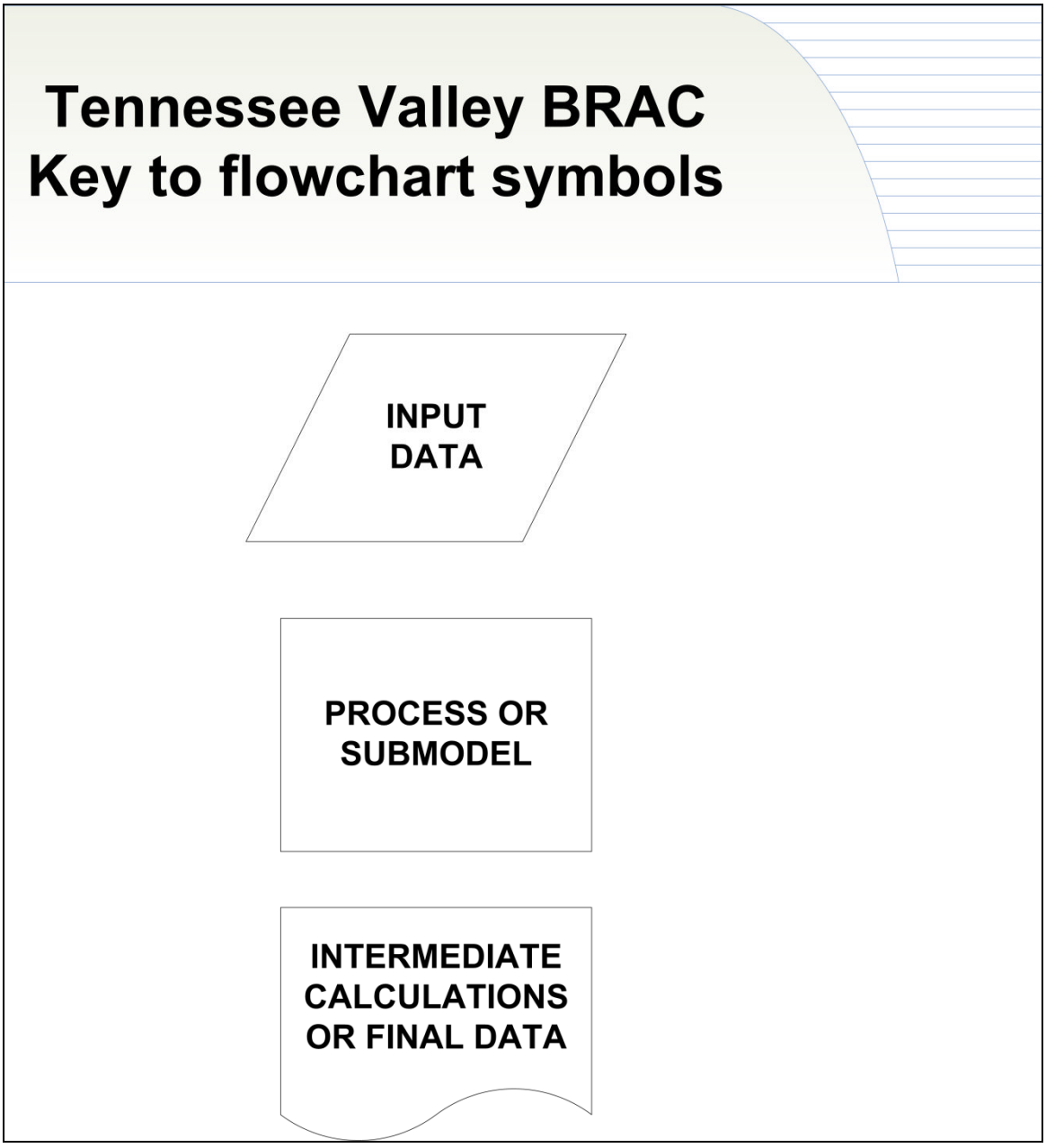
Source: Taimerica Management Company
*Does not include reductions from outgoing commands
**Includes reductions from outgoing commands
Note: All data, estimates, and projections are subject to variation.

Table 1-29
Tennessee Valley BRAC Process
Economic and Fiscal Impact Model
Permanent Spin-off Jobs by Sector

	Permanent Jobs			
	Indirect	**Induced**	**Total**	**%**
1. Agriculture, forestry, fishing, and hunting	7	18	25	0.4%
2. Mining	3	2	6	0.1%
3. Utilities	36	26	62	1.0%
4. Construction	79	18	97	1.5%
5. Manufacturing	446	170	616	9.5%
6. Wholesale trade	93	99	192	3.0%
7. Retail trade	99	838	938	14.4%
8. Transportation and warehousing	126	87	213	3.3%
9. Information	224	69	293	4.5%
10. Finance and insurance	46	116	162	2.5%
11. Real estate and rental and leasing	114	64	178	2.7%
12. Professional, scientific, and technical svcs	462	107	569	8.8%
13. Management of companies and enterprises	12	9	21	0.3%
14. Administrative and waste management svcs	705	150	855	13.1%
15. Educational services	4	143	147	2.3%
16. Health care and social assistance	2	774	776	11.9%
17. Arts, entertainment, and recreation	9	67	76	1.2%
18. Accommodation and food services	113	716	829	12.7%
19. Other services	147	303	449	6.9%
Total	**2,727**	**3,776**	**6,502**	**100.0%**

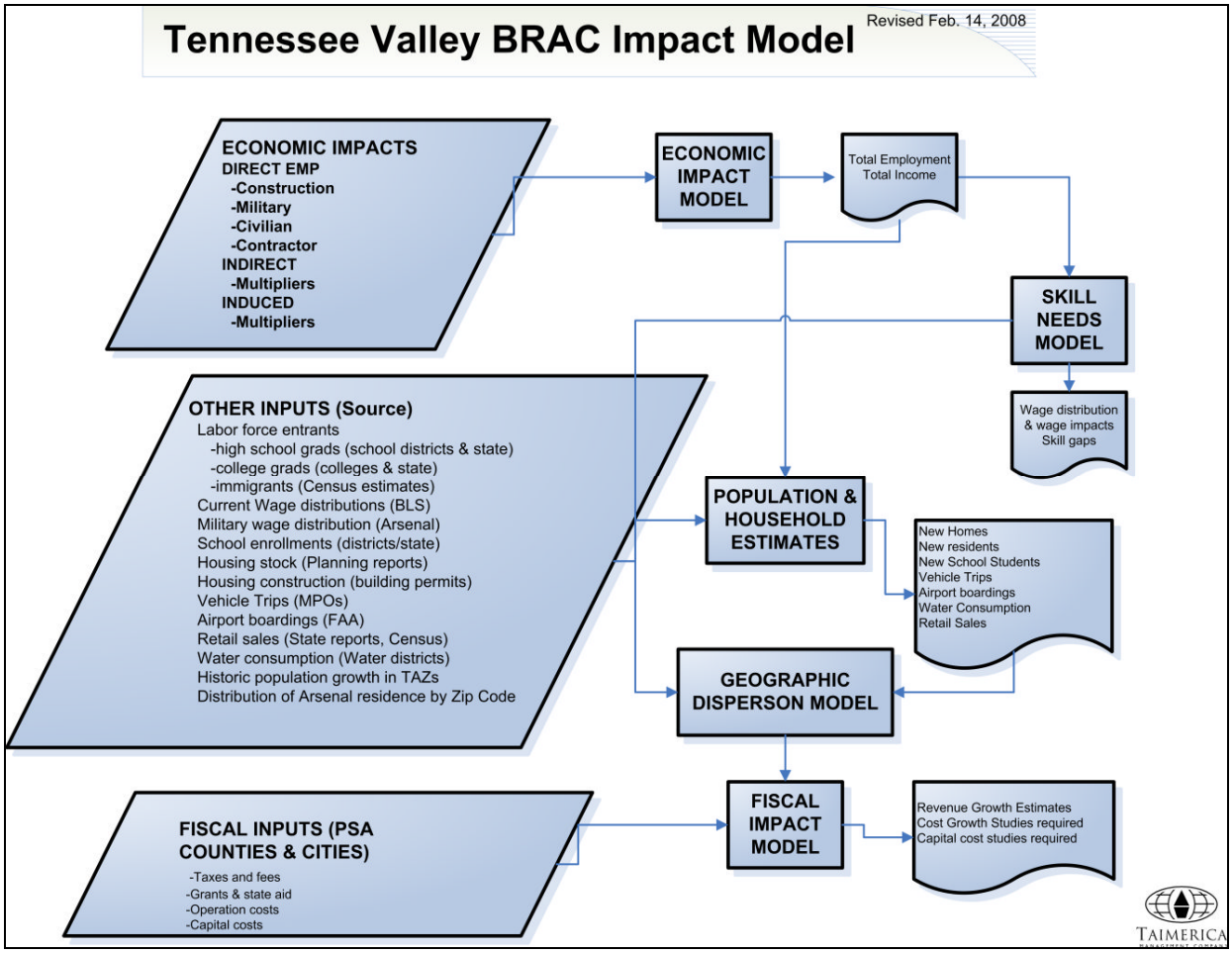
Source: Taimerica Management Company
Note: All data, estimates, and projections are subject to variation.

Figure 1-6



Source: Taimerica Management Company

Figure 1-7



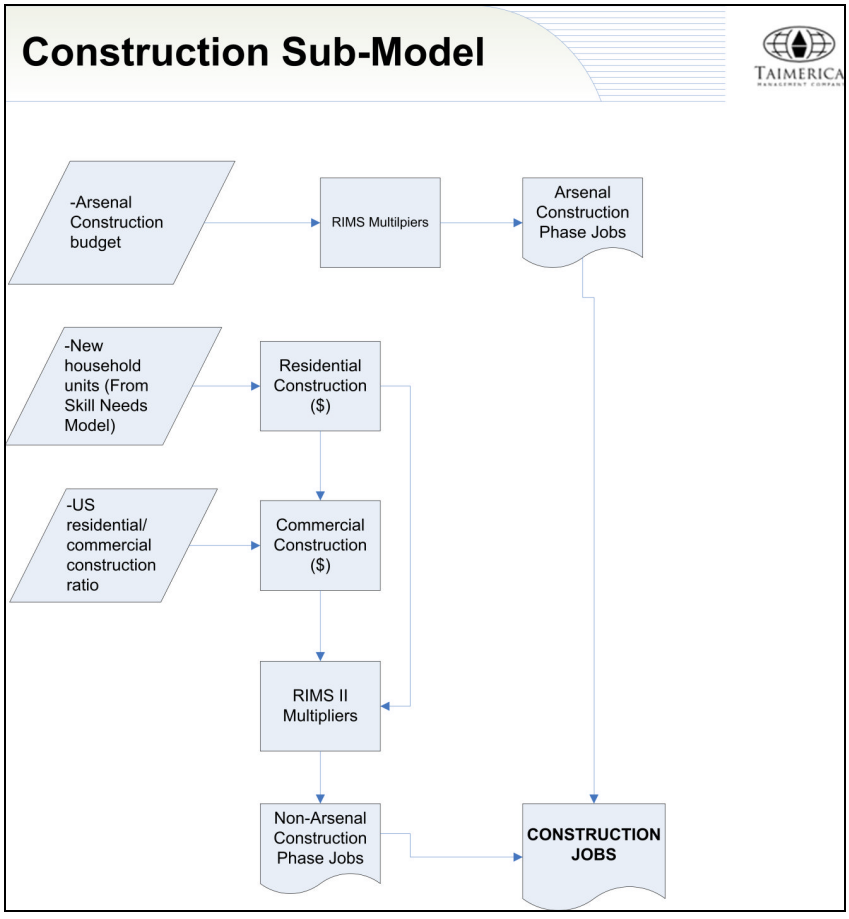
Source: Taimerica Management Company

Construction Sub-Model

The RIMS II multipliers for the BIR produced by the Bureau of Economic Analysis form the basis for estimating the construction phase jobs from the Arsenal BRAC. The model breaks construction into three components: Arsenal construction, new residential construction, and new commercial-industrial construction (see Figure 1-8).

Residential construction is based on the amount of estimated spending for new residential construction. This estimate is calculated by multiplying the average construction per residence in the PSA (collected from the Census Bureau's construction website) by the number of new residences estimated in the Skill Needs Model. Commercial construction is estimated from residential construction using the national ratio of residential/commercial construction. The total number of construction phase jobs is a summation of the construction jobs from each of these separate types of construction.

Figure 1-8



Source: Taimerica Management Company

Workforce Skills Model

The proportion of jobs likely to be filled by current residents of the Study Area is an important variable to estimate for the Tennessee Valley BRAC. Jobs filled by current residents of the region don't require new housing, do not create a demand for new commercial construction, or add students to school systems. The majority of BRAC-induced jobs in the Study Area will occur outside of the Arsenal fence. These jobs, when they do not require specialized skills, can be filled by unemployed or underemployed residents of the Study Area, by those changing jobs in the area, or by new entrants into the area's workforce. Jobs in the contractor workforce are often filled by residents that have retired from the military or from the federal civil service.

The Study Area has a current civilian workforce exceeding 500,000 with about 18,000 unemployed workers (see Table 1-30). About two-thirds of the unemployed live outside the three counties of the PSA. Because so much of the economic impact from BRAC stems from the creation of indirect and induced jobs, many of these jobs will also occur outside the PSA, and the match between unemployment and new jobs will be more balanced than anticipated on a cursory look at the situation.

Table 1-30
Employment and Unemployment in Study Area in 2006

Study Area	Labor Force	Employed	Unemployed	Unempl. Rate (%)
Primary Study Area Total	256,371	248,422	7,949	3
Broader Impact Region Total	256,031	245,411	10,620	4
Total	512,402	493,833	18,569	4

Source: Taimerica Management Company
Note: All data, estimates, and projections are subject to variation.

The region generates about 6,600 workforce entrants per year (see Column (F) in Table 1-20). The net flow of high school graduates represents about 40% of the new workforce with about 60% possessing post-secondary training (see Table 1-31). Many of these workers can fill unskilled jobs or entry-level jobs in consulting, business, or the federal civil service. The pool of new talent is diminished however by a growing pool of retirees. The proportion of the workforce entering retirement is unprecedented throughout the U.S. and has to be factored into any estimates of available labor force. In the Study Area the pool of retirees is likely to average about 5,000 workers per year during the next decade (see calculations in Column (I) in Table 1-20). The Consultant Team computed the number of retirees by taking the average number of residents in the age range of 55 to 65-years-old and multiplying by the proportion of this age group that leave the labor force in the PSA. This results in a net figure of about 10,000 workers per year. The job base of the Study Area therefore can grow by about 10,000 jobs per year without recruiting workers from outside the Study Area, provided the local labor force has skills matched to the jobs being added.

Table 1-31
Entrants by Educational Attainment

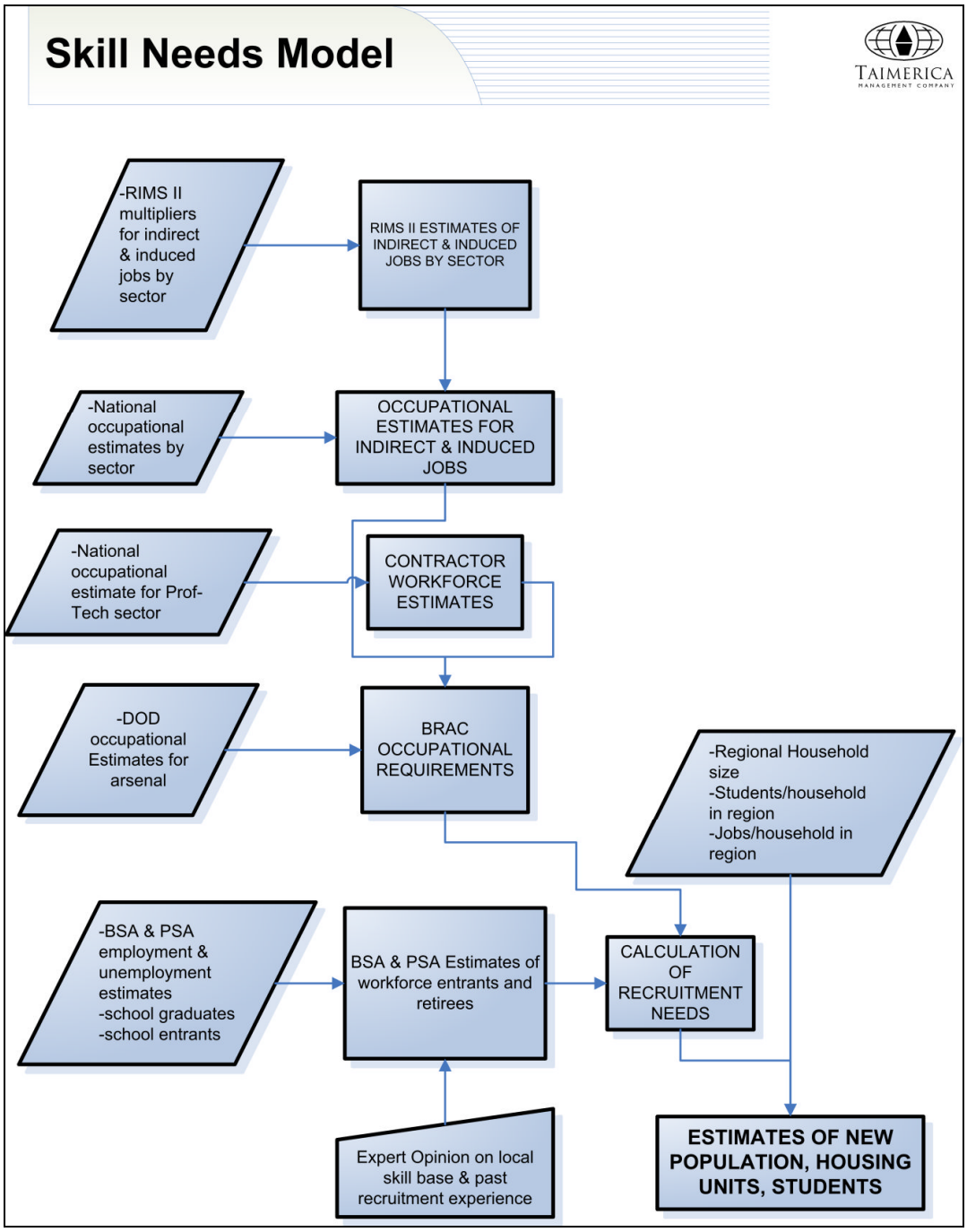
Type of Graduate	Number	%
High school grad	4,141	42
Associates level	2,123	21
Bachelors level	3,705	37
Total	**9,969**	**100**

Source: Taimerica Management Company
Note: All data, estimates, and projections are subject to variation.

The occupational skills of the new civilian jobs at the Arsenal have already been calculated by the DoD. Most of these jobs require advanced skills and experience specific to the new commands, and therefore are likely to be filled by workers recruited from elsewhere in the civil service. It can be concluded that because most of these positions are in senior positions within the affected commands, the vast majority of the positions at the Arsenal will be filled by recruits from elsewhere.

Taimerica developed a method for estimating the occupation of the contractor and spin-off workforce for this BRAC process (see Figure 1-9). This proprietary method combines RIMS II multipliers and national occupational estimates to develop detailed profiles of the occupational skills required by BRAC. These estimates suggest approximately 40% of the jobs that will occur in the Study Area will be in skilled positions, requiring advanced education or industry experience, with about half in unskilled positions. About half of the jobs will occur in office support, sales, computer programming, business and finance, and engineering. A significant share of the jobs will occur in fields such as food preparation, service and hospitality, or other types of personal services.

Figure 1-9



Source: Taimerica Management Company

Geographic Dispersion Model

The distribution of economic impacts can be accurately estimated using "distance decay" models. These models have been used reliably for over 40 years to estimate the geographic distribution of many socioeconomic variables including traffic flows, shopping center sales, and housing preferences. A large body of research in economic geography is available to help construct and calibrate these models.

A flowchart demonstrating the elements of the model is shown in Figure 1-10. The model was calibrated using a file of zip codes for the 9000+ Army personnel at the Arsenal as of December 2007. The Consultant Team integrated this data with calculations of distance and travel times from the primary Arsenal gates to model distance decay. A multiple regression model was constructed of the zip code patterns which explained 80% of the total variance. The best fit model consisted of an equation with two variables (square root of the distance to the gate and percentage of zip code population with a college degree). Other variables, such as percentage of housing stock built in the last five years, were tested but found to be statistically insignificant. This form of exponential data was expected for the relationship (distance decay, like gravity, is inversely related to distance in an exponential manner). The final form of the model is consistent with prior research in geography on distance decay.

The model estimates begin at the county level. Jobs from direct, indirect, and induced impacts are calculated individually to provide a more realistic fit to the data. Estimates of the number of direct jobs from the Arsenal or contractors were calculated for each of the counties within the Study Area. The proportion of direct jobs in each county is estimated from the distance decay model of Army payroll data. Different methods are used to then calculate the indirect and induced jobs in the PSA. Because the density of jobs is much higher in the PSA, calculations at the zip code level are statistically valid. The lower density of jobs in the BIR makes zip code estimates unreliable.

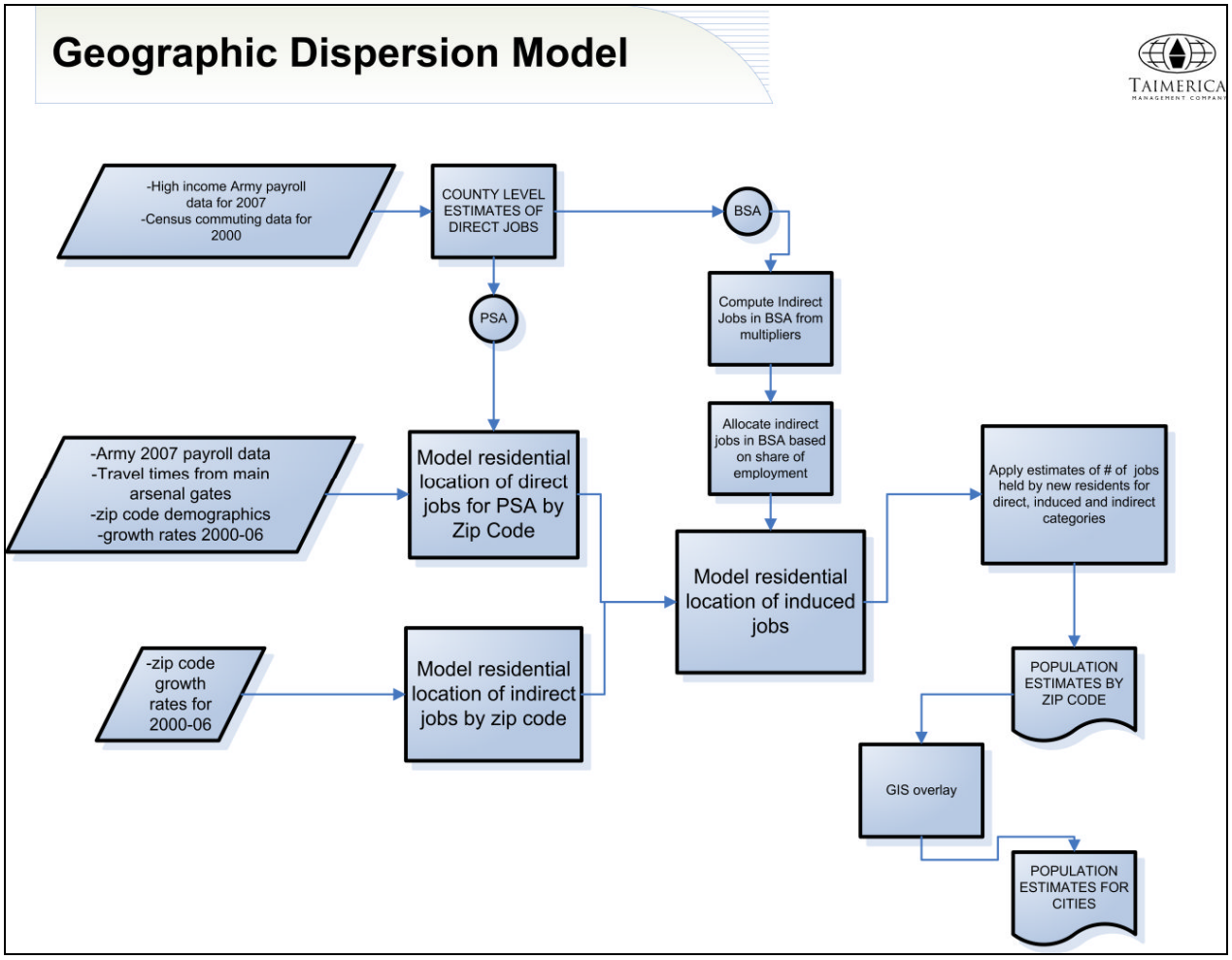
Estimates of indirect and induced jobs for the BIR are calculated for each county based on the proportion of overall employment in that county. The Consultant Team was able to calculate the proportion of total jobs that would occur in the BIR because multipliers were obtained for the entire Study Area. These multipliers are slightly higher than those for the three counties in the PSA. The differential between the two sets of multipliers represents the impact occurring in the BIR. These differentials were allocated to each of the ten counties in the BIR based on the size of each county's economy, as measured by its overall employment. The induced impacts, which represent consumer spending, were then calculated based on the sum of the direct and indirect jobs in the county.

The calculations were similar in the PSA except at a zip code level of geography. The residential location of the new direct jobs from the Arsenal and contractors were estimated from the distance decay model, weighted by residential zip code growth rates over the last six years. Growth rates weight the distance decay toward those zip codes with the highest growth potential. (The Army data represents the residential location of all Army employees, most of whom chose their residence over 20 years ago. This static data is unreliable for estimating

new residential patterns without the addition of a growth variable.) Indirect and induced jobs were estimated using overall population growth rates for each of the zip codes.

Once the geographic job pattern was estimated, Taimerica used output data from the Workforce Skills Model to estimate the number of new residents in each of the zip codes and counties. The Workforce Skills Model used expert opinion and Taimerica's past consulting experience to determine the proportion of direct, indirect, and induced jobs that would be filled by current residents of the Study Area. These ratios were used for each zip code and county to estimate population growth. The zip code estimates in the PSA were translated into population estimates for cities using a GIS overlay of zip code and city limits.

Figure 1-10



Source: Taimerica Management Company

Table 1-32
Additional Assumptions and Background Information

Assumption	Value	Source
ECONOMIC IMPACT MODEL		
Military & federal civilian/embedded contractor jobs	See text	Supplied by the Arsenal
Contractor Tail jobs	1.3 x civilian	Estimated from past BRACs and comparison with other metros
Indirect & induced jobs	See text	Calculated from RIMS II multipliers
PAYROLL		
Military & civilian jobs	$80,000/yr	Calculated from military, GS & SES pay scales
Contractor Tail jobs	$80,000/yr	Estimate calculated by the Arsenal
Indirect & induced jobs	$29,850/yr	Calculated from DOL Occupational wage surveys
CONSTRUCTION SUBMODEL		
Arsenal construction		Supplied by the Arsenal
Construction cost of residential units	$108,000	Calculated from Census Bureau Building Permit reports
Residential units built	1.0/household	Taimerica assumptions
Commercial & institutional construction	0.8 x residential $	National ratio from Census Bureau construction reports
SKILL NEEDS MODEL		
Jobs/household	1.48	Ratio of employment/Census estimated households in 2006
Population/household	2.47	Census Bureau American Community Survey for PSA
Estimates of jobs filled locally	See text	Past experience at the Arsenal; estimates by Taimerica
Occupations of Arsenal jobs	See text	Supplied by the Arsenal
Occupations of contractor jobs	See text	Calculated from national occupation profile for prof/technical services
Occupation of indirect/induced jobs	See text	Calculated from national occupational profiles for each emp. In each sector of indirect/induced jobs
POPULATION & HOUSEHOLD ESTIMATES		
New population	2.47 x NHH	NHH = new households
New K-12 students	0.4/HH	HH=household; Current enrollments in Madison County/HH
New homes	1.0 x HH	1 per new household, consultant's assumption
New vehicle trips	1/commuter	Calculated from number of new commuters entering PSA
Airport boardings		Calculated on number of new jobs in region
Water consumptions	200 gpd/pp	Gallons/day per person; county average from TX Water Dev. Board survey
Retail sales	0.4 x payroll	40% of new payroll; national average

TABLE CONTINUES NEXT PAGE

Source: Taimerica Management Company
Note: All data, estimates, and projections are subject to variation.

Table 1-32, continued
Additional Assumptions and Background Information

Assumption	Value	Source
GEOGRAPHIC DISPERSION MODEL		
Direct jobs location in PSA	DDM	Distance decay model estimated from zip codes of 9000+ Army paychecks at the Arsenal in 2007; weighted by zip code growth rates from 2000-2006
Direct jobs in BIR	Payroll	Calculated from county location of paychecks >75 k in 2007 for Arsenal Army payroll
Indirect/Induced jobs in BIR	Ratios	Calculated from share of current BIR jobs in each county
Indirect/induced in PSA	Zip growth rates	Calculated from zip code growth rates for 2000-2006
City estimates	GIS	Share of county population in zip codes within city in 2006
FISCAL IMPACT MODEL		
Sales tax revenues	Various	Computed from rates downloaded from AL Dept. Revenue; rate x retail sales estimate for each jurisdiction
Property tax revenues	Various	Computed from rates downloaded from AL Dept. Revenue; rate x estimated new assessment in each jurisdiction
Assessment values	Various	New residential + commercial construction x 20% ratio; within PSA assessments allocated to cities/unincorporated based on 2006 population estimates
Sales tax collections in municipalities	Various	Calculated from Census Bureau 2005 zip code estimates of retail employment allocated to city limits via GIS overlays of zip code areas
State Gasoline taxes	Various	Per capita figures calculated from gallons in 2006 reported by AL Dept. Revenue x peak populations in each county
Lodging taxes	Various	Per employee figures calculated from AL Dept. Revenue report for 2007; revenues= per employee revenues x new employees in each county
School taxes	Various	Actual tax rates x estimated new assessment in each jurisdiction

Source: Taimerica Management Company
Note: All data, estimates, and projections are subject to variation.