The Impacts of Alternative Uses of the Volunteer Army Ammunitions Plant Site on the Urban Poor

by

Brian Fikkert, PhD
Director, Chalmers Center for Economic Development
Associate Professor, Covenant College

David Shideler, MS
Research Associate, Chalmers Center for Economic Development

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Chalmers Center for Economic Development
Covenant College
14049 Scenic Highway
Lookout Mountain, GA 30750 USA
706-419-1805
chalmers@covenant.edu
www.chalmers.org

Abstract

Hamilton County and the City of Chattanooga have purchased a parcel of the Volunteer Army Ammunitions Plant (VAAP) in hopes of attracting a major manufacturing firm to the region. Several alternative types of firms have been discussed, including automobile or computer plants. The following paper examines the impact that either of these choices would have on job opportunities for the poor. Using a state-of-the-art, computerized economic model, we measure the impacts of the automobile and computer plants on 819 occupations distributed across 528 economic sectors. We find that both choices would create a large number of jobs for unskilled and low-skilled workers at wages that are above the poverty level. However, the automobile plant creates over 700 more jobs than the computer firm. Furthermore, the auto plant creates jobs that are more accessible to the poor and pay higher wages. If government officials want to help the poor, the choice is clear. Similar analyses could be performed for other potential firms. We also find that efforts to prepare the poor for work should focus on "soft skills" training. Such training may best be provided by grassroots, community organizations that can provide low-income persons with supportive relationships to address the behavioral, emotional, and social dimensions of work readiness.

Almost one year ago, the City of Chattanooga and Hamilton County purchased a 940-acre parcel located within the Volunteer Army Ammunitions Plant (VAAP) site near Ooltewah, TN. This purchase was viewed as part of the solution to Chattanooga's stagnant economic and population growth, as it provided ample land within the city for the construction of industrial and commercial property for the first time in decades. City and county officials have often cited the lack of available land and buildings as a major weakness for the city, and the absence of available industrial sites caused several large corporations to locate elsewhere.

As the community watched the purchase of the VAAP site and the launching of the Chattanooga Regional Growth Initiative (CRGI), many wondered how these economic development initiatives would impact low-income residents of Chattanooga's inner-city. Mayor Kinsey had placed great emphasis on urban neighborhoods, creating the Department of Neighborhood Services and dedicating financial resources to assist neighborhoods in their revitalization. Furthermore, there has been a rise in the prominence of grassroots organizations working to reclaim communities from crime and violence, to instill hope through educational and family programs, and to create wealth through economic development projects. Many have wondered how these inner-city efforts will be connected to and supported by the purchase of the VAAP site and the CRGI.

The present paper examines how alternative uses of the VAAP site will impact employment opportunities for inner-city residents, and it suggests ways to link the efforts of grassroots organizations to the VAAP strategy. In a companion paper-- *The Potential Impact of the Chattanooga Regional Growth Initiative on the Urban Poor*--we examine similar issues for the CRGI (see Fikkert and Shideler 2001).

The most logical way to connect the inner city to an economic development strategy is to create jobs which are "accessible" both in terms of location and skill requirements. Urban residents often do not have access to adequate transportation, so locating jobs near their places of residence is an important element of "accessibility." Of course, it will do little good to place jobs in close geographic proximity to the inner-city population if those jobs do not match the education, abilities, and experiences of that population. Unfortunately, achieving both dimensions of accessibility is never easy. The VAAP site is clearly deficient in terms of proximity to the inner-city, and complementary investments in transportation will be necessary if the urban poor are to find employment at the VAAP site. The present paper does not address these geographic concerns but focuses on the extent to which alternative uses of the VAAP site create jobs which are accessible to the urban poor in terms of matching their skill requirements. However, the issue of geographic accessibility cannot be overlooked if the urban poor are to be helped by this or any other economic development initiative.

In addition to accessibility there is another concern: economic mobility, the process by which individuals increase their wealth and consequently move themselves from a lower to a higher economic class. In the case of the poor, the challenge to city leadership is to create accessible jobs that empower people to move out of poverty and into economic self-sufficiency.

In this paper, we seek to compare and contrast two alternative uses of VAAP to identify the use that maximizes opportunities for the urban poor to become economically empowered. Specifically, we will consider the following questions:

1. Which use creates jobs accessible to the urban residents of Chattanooga, with a particular interest in the urban poor?
2. Which use provides greater empowerment of the poor with respect to upward economic mobility?
3. What is the best way to link the VAAP initiative to grassroots, community development efforts?

Clearly, there are more than two possibilities for use of the VAAP site. The following paper is simply meant to illustrate a methodology that can be employed to consider various options in the future and to raise important issues that government officials should consider as they seek to formulate the most effective public policy.

Methodology[1]

The city has considered attracting either an automobile or a computer plant employing several hundred people to the VAAP site, so for the present study we assumed that either plant would directly employ 350 people (Walton 2000). We want to know which plant would provide greater opportunities for the poor.

At first glance it might appear that determining this is rather straightforward. It seems that one could simply compare the types of jobs in automobile and computer plants and determine which plant tends to require more unskilled or low-skilled workers. Unfortunately, this approach would miss a large percentage of the total impact of a plant locating at VAAP. For example, the 350 people "directly" employed at the automobile plant are only a fraction of the total number of jobs created by the automobile plant, for the plant will need inputs to operate. It will have to purchase nuts and bolts, leather, wires, etc. from other firms. To the extent that these other firms are located in Chattanooga, there will be additional growth in employment in these firms to meet the increased demand for their output. This growth in linked firms is referred to as the "indirect effect" on employment of the automobile plant. Furthermore, the increased employment in the automobile plant and its suppliers will result in more people with more jobs in the Chattanooga region. These people are likely to spend a large percentage of their salaries on locally produced goods and services, thereby generating even more demand for Chattanooga's firms. This increase in demand will result in firms having to hire even more workers, the resulting increase in employment being called the "induced effect" of the automobile plant.

Clearly, trying to measure the number of jobs created by the direct, indirect, and induced effects is a mammoth undertaking, requiring detailed knowledge of inter-firm linkages, the local structure of the economy, and consumer spending patterns. Furthermore, we want to know not only the numbers of jobs created but also the nature of those jobs in terms of skill requirements and wages. The informational and computational requirements are mind-boggling.

[1] See Shideler and Fikkert 2001 for a detailed description of the methodology employed in this paper.

Fortunately, economists have developed a methodology--input-output analysis--to handle this complexity. Input-output analysis uses data on economic linkages between industries in the U.S. economy, data on the local industrial composition, and data on expenditure patterns of consumers of various income levels to estimate the direct, indirect, and induced effects on various occupations. When combined with additional data on the skill requirements of those occupations, it is possible to analyze the impacts of alternative uses of the VAAP site on jobs which are appropriate for the poor.

For this paper, we use IMPLAN software to perform the input-output analysis on 819 occupational categories distributed across 528 economic sectors in Chattanooga. IMPLAN was originally created for the U.S. Department of Agriculture Forest Service as a planning tool for its Land Management Planning Unit. IMPLAN has been widely used by the academic and economic development communities to estimate structural changes to local economies. The software utilizes local employment and output data available at the county or zip code level and national production functions to simulate a locale's economy. The database is built from Bureau of Labor Statistics' Covered Wages and Employment Survey (ES-202 data) and output data from the Bureau of Economic Analysis. By inputting an employment or output change, the software is able to estimate the impact a structural change will have in the local economy for 528 economic sectors, including government and non-profit sectors.[2] IMPLAN generates estimates of employment, output, labor income and taxes generated from the economic shock. IMPLAN also provides a staffing patterns matrix to translate the industrial employment impacts into occupational employment estimates for 819 different occupations.

Once IMPLAN has estimated the number of jobs created in each occupation, it is important to gain some understanding of the nature of those jobs in terms of their wages and skill and educational requirements. Towards that end, we utilized the O*NET Career Exploration Program of the National O*NET Consortium, which stratifies occupations into five categories by their Specific Vocational Preparation (SVP) value. We assigned these "job zone" values to the 819 occupations in our data set.[3] The job zone categories provide the database user with an idea of how much training, education and experience is needed to enter any given occupation. The job zones are assigned a number between 1 and 5, where a higher number corresponds to higher experience, education, and/or training requirements for occupations in that job zone. For example, Job Zone 1 contains all the occupations for which no previous experience, high school education or training is required. Job Zone 5, on the other hand, contains those occupations that require extensive skills and education, with a bachelor's degree being the minimum education requirement. By sorting the final occupational projections by job zone, we were able to aggregate the distribution of jobs across the job zones and compute the average wage for each job zone, in addition to identifying the estimated number of jobs and average wages in each occupation within each job zone. Table 1 presents descriptions of the five job zones.

Although input-output analysis is a powerful tool, there are two major drawbacks with using input-output analysis to generate employment projections. The first is that one cannot predict

[2] Of the 528 institutions in IMPLAN, ten of these sectors were excluded from our analysis due to their inappropriateness to our study.

[3] Since an SVP cannot be calculated for aggregated occupation codes (i.e., our "other" categories), we assigned the most common job zone category within the occupational group as the job zone for the aggregated occupation code.

how long it will take the direct, indirect, and induced effects to be fully realized in the local economy. Typically, economic developers would say that it takes a *reasonable* amount of time – not more than 10 years--but it is hard to be precise about how long it will take the economy to fully adjust to the initial event. Second, while input-output analysis generates specific employment and output figures, these figures are based on data which is imperfect; hence, the figures should be viewed as estimates of impact magnitude and not as precise measures.

Table 1: Job Zone Descriptions

Job Zone	Description	SVP Range	Examples
1	• No previous work-related skill, knowledge, or experience is needed for these occupations. • One may need a high school diploma or GED. • Training will last as few as a couple of days to a couple of months.	< 4.0	• Bus drivers • General office clerks • Home health aides • Waiters/Waitresses
2	• Some previous work-related skill, knowledge, or experience may be helpful in these occupations, but usually is not needed. • A high school diploma or GED is required, and in some cases additional vocational training or course work may be necessary. • Training will last between a few months and one year.	4.0 – 6.0	• Drywall installers • Flight attendants • Salespersons • Bank tellers
3	• Previous work-related skill, knowledge, or experience is required for these occupations. • Most occupations will require vocational training, on-the-job experience, and/or an associate's degree. Some may require a bachelor's degree. • Training requires one to two years involving on-the-job/informal training.	6.0 – 7.0	• Dental assistants • Fish and game wardens • Personnel recruiters • Recreation workers
4	• Minimum of two to fours of work-related skill, knowledge or experience is required. • Most occupations will require a four-year bachelor's degree. • Training involves several years of on-the-job and vocational training.	7.0 – 8.0	• Accountants • Chefs • Historians • Pharmacists
5	• Extensive skill, knowledge, and experience are needed for these occupations. Many require more than five years of experience. • A bachelor's degree is the minimum requirement for these occupations. Many require a graduate degree. • It is assumed that the individual is already trained for the position.	> 8.0	• Lawyers • Doctors • Scientists

Results and Implications

Table 2 presents IMPLAN's estimates of the total employment impact that the automobile and computer plants would have in Hamilton County, TN. The employment impact is also broken down into its direct and indirect and induced effect to demonstrate the linkages that exist within the local economy for each plant option. One can see from the indirect and induced effects that an automobile manufacturing plant would complement the local economy very well as it creates nearly five jobs throughout the economy for every one job at the new plant. The computer plant would only generate an additional two jobs for every job at the plant. While this demonstrates strong linkages to the local economy, the multiplier effect of the automobile plant is bigger. So, the automobile plant creates more jobs and has a larger impact on the broader economy than the computer plant of equal size.

Table 2: Direct, Indirect and Induced Affects of the VAAP Site

	No. of Jobs	
Type of Impact	Automobile Plant	Computer Plant
Total	1,963	1,070
Direct	350	350
Indirect and Induced	1,613	720

Table 3 classifies the employment impact from each option into job zones. Both manufacturing plants generate ample opportunities for unskilled workers, but the automobile plant creates over 700 more jobs in Job Zones 1 and 2, which require no more than a high school education. Table 3 also presents the wage range and average wages by job zone for the jobs created under each scenario. The wages for both plants exceed the minimum wages and the poverty guidelines,[4] suggesting that either firm at VAAP could bring economic empowerment to the poor in Chattanooga.[5] (Average annualized[6] pay is $30,000 and $30,250 for the computer manufacturing and car factory scenarios, respectively.) The automobile plant, however, generates jobs with a higher overall average wage, and higher wages for Job Zones 1, 2, and 3 than those from the computer plant. The automobile plant appears to have the higher potential impact on the poor, since it would generate a larger proportion of jobs accessible to unskilled and low-skill workers and would pay higher wages.

Additionally, the data in Table 3 are at least suggestive of the types of vocational training/educational programs that labor market intermediaries--e.g. workforce development

[4] For our purposes, the poverty line was defined as the US Department of Health and Human Services Poverty Guidelines, which are established every 10 years based upon the decennial census and adjusted annually for inflation. The Poverty Guidelines are the qualifying income levels for many federal and state welfare programs. In 2000, the Poverty Guideline for a family of four was $17,050.

[5] The data used to compute these wages for each occupation are from national averages. Hence, they are accurate reflections of Chattanooga's situation to the extent that Chattanooga's labor markets follow national trends. Clearly, this is more likely to be true in the long-run than in the short-run.

[6] Multiplying the hourly wage by 2,040 hours (40 hrs/wk times 52 weeks) annualizes hourly wages. This is the methodology suggested by the US Department of Labor, Bureau of Labor Statistics.

organizations, jobs readiness trainers, and welfare-to-work programs--should design.[7] Given the high number of new jobs which require low levels of education and no formal training (Job Zones 1 and 2), labor market intermediaries should consider job readiness programs that focus on "soft skills" training such as writing a resume, interviewing for a job, communicating effectively, being timely, exhibiting attitudes of respect, having a good work ethic, etc. One of the key ways to link the VAAP initiative to grassroots, community development efforts is for the city to encourage and support organizations that provide the "soft skills" training required for low-income persons to access the jobs created by bringing a firm to VAAP.

These results provide good news for local Temporary Assistance for Needy Families (TANF) programs. Because TANF recipients must seek employment first before receiving technical training and/or education vouchers, it is imperative that there be a large number of jobs available that do not have substantial educational requirements. Both the automobile and computer plants will generate many jobs that do not require technical training or higher education; hence, there is reason to hope that TANF recipients will be able to obtain work and then qualify for vouchers to receive additional education, which should eventually lead to their earning higher wages.

Table 3: Jobs Created by Each Manufacturer and Their Wages by Job Zone

Plant	Job Zone	No. of Jobs (% of total jobs created)	Hourly Wage Range	Average Hourly Wage
Automobile	Total	1,963	$5.87 – $50.70	$14.82
	1	661 (34%)	$5.87 – $19.40	$10.08
	2	562 (29%)	$6.10 – $26.71	$12.52
	3	360 (18%)	$6.73 – $27.28	$14.29
	4	285 (15%)	$8.12 – $40.86	$18.91
	5	95 (5%)	$10.19 – $50.70	$24.12
Computer	Total	1,070	$5.87 – $50.78	$14.71
	1	284 (27%)	$5.87 – $19.40	$9.75
	2	234 (22%)	$6.10 – $26.74	$12.24
	3	222 (21%)	$6.73 – $27.79	$14.19
	4	244 (23%)	$8.14 – $40.86	$19.02
	5	86 (8%)	$10.19 – $50.78	$24.36

For occupations requiring more specific skills training, labor market intermediaries would need to know the exact occupations for which to target their programs. Table 4 presents the list of occupations, by job zone, in which 10 or more jobs would be created due to a new automotive assembly plant (A complete list of jobs created for all occupations by both the automobile and computer plants is available from the authors upon request). For example, 44 general office clerk positions would be created paying, on average, $9.66 per hour. Likewise, 56 top executive/general manager positions would be created paying, on average, roughly $58,900 annually ($28.88 per hour times 2,040 hours per year).

[7] The results presented in Table 3 are only suggestive since other factors affect the demand for workforce development activities, such as the extent to which the skills already exist in the workforce, the state of the labor market/local economy, and the present existence of appropriate training programs.

Local technical or community colleges may want to focus on providing training for the rapidly growing occupations in Job Zone 3, which require some post-secondary education. Specifically, using Table 4 we see that local technical schools may want to consider providing training for manufacturing supervisors and electricians. Furthermore, organizational management skills are common among Job Zone 4 and 5 occupations, which suggests that local colleges and universities may want to increase the resources they allocate to providing courses in these areas.

To identify further the specific characteristics of an occupation, one would consult the O*NET 3.0 database (available on-line at www.onetcenter.org). This exhaustive database provides the intermediary with information on the skills, minimum education level and/or training, and experience requirements as well as examples of tasks and other characteristics associated with the occupation. For example, the three most common tasks of general office clerks are documenting/recording information, processing information, and communicating with individuals outside the organization. The most important skills to an office clerk include clerical skills, customer and personal service and mastery of the English language. A readiness program targeting this particular occupation would focus on developing competency in these skills and tasks.

Table 4: Specific Occupations, by Job Zone, Impacted by the Automobile Manufacturer Scenario*

Occupation Title	No. of Jobs	Average Hourly Wage
Job Zone 1		
General Office Clerks	44	$9.66
Truck Drivers, Heavy or Tractor-Trailer	38	$13.98
Cashiers	36	$6.94
All Other Helpers, Laborers, and Material Movers, Hand	27	$9.88
Truck Drivers, Light, Include Delivery and Route Workers	25	$10.31
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	24	$8.94
All Other Hand Workers	22	$14.77
Waiters and Waitresses	22	$5.88
All Other Machine Operators and Tenders	19	$14.25
Maids and Housekeeping Cleaners	17	$7.09
Combined Food Preparation and Service Workers	17	$6.18
All Other Freight, Stock, and Material Movers, Hand	17	$10.15
Welders and Cutters	17	$12.97
Receptionists and Information Clerks	16	$8.89
Shipping, Receiving, and Traffic Clerks	16	$10.12
Stock Clerks, Sales Floor	16	$7.71
Production Inspectors, Testers, Graders, Sorters, Samplers, and Weighers	14	$14.55
Vehicle Washers and Equipment Cleaners	13	$7.04
Hand Packers and Packagers	13	$7.78
Food Preparation Workers	12	$6.92
Laborers, Landscaping and Groundskeeping	12	$9.12
Industrial Truck and Tractor Operators	11	$13.62
Sewing Machine Operators, Nongarment	10	$8.41
All Other Clerical and Administrative Support Workers	10	$11.62
Job Zone 2		
Assemblers and Fabricators, Except Machine, Electrical, Electronic, and Precision	103	$13.68
Salespersons, Retail	51	$8.80
Secretaries, Except Legal and Medical	34	$11.31

Bookkeeping, Accounting, and Auditing Clerks	29	$11.20
Sales Representatives, Except Retail and Scientific and Related Products and Services	27	$19.09
Automotive Mechanics	24	$12.87
Stock Clerks - Stockroom, Warehouse or Storage Yard	15	$9.94
Automotive Body and Related Repairers	13	$14.00
Carpenters	11	$15.06
Sales Representatives, Scientific and Related Products and Services, Except Retail	10	$22.68
Job Zone 3		
First-Line Supervisors and Managers/Supervisors - Sales and Related Workers	26	$17.13
First-Line Supervisors and Managers/Supervisors - Clerical and Administrative Su	21	$15.43
Maintenance Repairers, General Utility	19	$11.80
Electricians	17	$18.58
First-Line Supervisors and Managers/Supervisors - Production and Operating Workers	16	$19.41
All Other Professional, Paraprofessional, and Technical Workers	13	$22.81
Job Zone 4		
All Other Engineers	21	$28.60
Registered Nurses	16	$19.85
Accountants and Auditors	15	$19.69
All Other Managers and Administrators	13	$25.95
All Other Management Support Workers	12	$21.15
Teachers, Elementary School	12	$17.79
First-Line Supervisors and Managers/Supervisors - Mechanics, Installers, and Repairers	11	$18.49
Financial Managers	10	$27.41
Teachers, Secondary School	10	$18.67
Job Zone 5		
General Managers and Top Executives	56	$28.88

* Only those occupations in which 10 or more jobs were created are presented here.

Conclusion

Overall, the automobile plant seems to be the more promising of the two options for the VAAP site in terms of creating jobs for the poor in Chattanooga. Not only are more jobs created by the automobile plant throughout the economy, a higher proportion of those jobs will go to unskilled and low-skilled labor than of those jobs created by the computer plant. In addition, the jobs resulting from the automobile plant pay more than those of the computer plant for jobs in Job Zones 1, 2, and 3 – the job zones accessible to the poor. If government officials want to create job opportunities for the poor, the choice is clear. Similar analyses could be done in the future to examine the impacts of other options.

As mentioned earlier, raising demand for unskilled and low-skilled labor is necessary but not sufficient to empower inner-city residents to obtain stable employment. In fact, without additional interventions, significant barriers to stable employment are likely to persist. Depending on where these new jobs are located geographically, inner-city residents may face prohibitive transportation barriers in accessing these jobs. Furthermore, many low-income residents need "soft-skills," job-readiness training such as writing a resume, interviewing for a job, communicating effectively, being timely, exhibiting attitudes of respect, having a good work ethic, etc. Unless these transportation and job-preparedness issues are addressed, it is likely that the VAAP initiative will bypass the poor. Although transportation issues can be addressed by the public sector, the behavioral, emotional, and social dimensions of preparing people for work

are best addressed by grassroots, community development organizations that can provide low-income persons with supportive relationships that the public sector simply cannot offer. There is increasing evidence that such support is often strongest when provided by faith-based, charitable organizations.

The complex nature of poverty requires a multifaceted approach in which the government, business, and non-profit sectors work together in concert, each respecting the legitimacy and necessity of the other sectors. Few cities in America can orchestrate such a concert, but Chattanooga's legacy of cooperation makes it the ideal conductor.

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