A User Guide to the

SEBAS

Socio-Economic Benefits Assessment System

A Rural Business-Cooperative Services Assessment Tool for Economic Development

Dennis Robinson, Zuoming Liu
Community Policy Analysis Center
University of Missouri-Columbia
Columbia, MO

December 2004

CHAPTER 1: INTRODUCTION

The United States Department of Agriculture (USDA) Rural Business-Cooperative Services (RBS) promotes a dynamic business environment in rural America. RBS helps fund projects that create or preserve quality jobs and enhance the quality of life in rural communities across the nation. RBS works in partnership with the private sector and community-based organizations to provide financial assistance to meet business and credit needs in under-served areas.

Responding to increasing requirements for program performance measures and changing conditions in rural areas, the Rural Business-Cooperative Services is reevaluating the efficacy of its loan and grant programs. The USDA Economic Research Service has entered into a cooperative agreement with the Community Policy Analysis Center (CPAC) at the University of Missouri-Columbia to develop a research program to assess the effectiveness of the RBS programs. This research will assess the need that the RBS programs fulfill, the effectiveness of the programs in meetings those needs, and the impacts of economic, demographic, and policy changes on RBS operations.

WHAT IS THE SOCIO-ECONOMIC BENEFITS ASSESSMENT SYSTEM?

The RBS Socio-Economic Benefits Assessment System (SEBAS) is a locally-based decision support system developed by the Community Policy Analysis Center of the University of Missouri-Columbia. SEBAS evaluates the performance and effectiveness of RBS' loan and grant programs across the nation by measuring the economic and social impacts that these loans and grants have on the affected rural community environments.

The purpose of this report is to introduce SEBAS. Included here is brief history of the system's development and implementation. Instructions for the use of SEBAS are provided by way several example applications of SEBAS. Three such case studies are presented in this report. One case study is based on an actual RBS Intermediary Relending Loan given to a small firm in Butte, Montana. The other two case studies involve two hypothetical rural commercial developments in Ashe County, North Carolina. The purpose of the two hypothetical commercial development case studies is to illustrate and compare the impact results provided by SEBAS in the same geographical area but two different users of RBS' loan program. A number of alternative suggestions are given for the current RBS program evaluation criterion based on the regional impact results provided by SEBAS. Finally, recommendations are made regarding possible enhancements to SEBAS.

HISTORY OF THE SYSTEM

Researchers at CPAC have assembled SEBAS to address RBS' evaluation needs. SEBAS is be able to evaluate not only the number of jobs created or retained, but it will also be able to estimate the types and quality of jobs affected directly and indirectly due to your firm's activities (among other benefit measures). Researchers at CPAC have implemented an innovative regional economic impact methodology that not only addresses the local social and economic effects of RBS' loans and grants, it also provides estimates of the effects as they spread to surrounding counties and beyond, within the state where the loans or grants are issued.

A multi-regional social accounting matrix (SAM) modeling methodology was implemented for the RBS benefit evaluations. The basic idea underlying the SAM framework is to provide a simple and convenient method of keeping track of the flows of payments (incomes or receipts) and expenditures (payments or purchases) within an economy. Actually, a SAM framework consists of a series

of interrelated accounts where "what is 'incoming' into one account must be 'outgoing' from another account" (King, 1985). The information within a SAM reveals much about the economic and social structure of the area for which it is constructed.

Researchers at CPAC used the SAM databases compiled by IMPLAN for the year 2001 to construct multi-regional SAM models for each all counties within the five states of California, Montana, North Carolina, New Hampshire, and Vermont.[1] In all, there are 238 counties in these five states. Each SEBAS multi-regional SAM impact model consists of three geographic areas. One area is the county where a loan or grant is given. A second area consists of the surrounding, adjacent counties. And, a third area is an aggregation of the remaining counties within the same state.

WHAT DOES SEBAS DO?

Currently, RBS evaluates the effectiveness of its loan and grant programs using the number of jobs created or retained due to its programs. SEBAS offers an opportunity to consider a much wider and richer array of possible assessment criteria. The array is "wider" because there are a greater number of possible assessment variables than just the number of jobs created or retained. Also, the array is "richer" for two important reasons. First, SEBAS not only considers the direct effects of RBS' activities (like the current evaluation procedure) but it also addresses the indirect effects of the loan and grant programs. Second, SEBAS provides an evaluation of the geographic dispersion of RBS' social and economic effects.

SEBAS generates the standard economic impact measures that are provided by most regional economic impact models. These measures include

[1] The States of New Hampshire and Vermont were treated as if they were one state for modeling purposes.

such evaluation information as business sales (called output in SEBAS), income (measured either by employee compensation or proprietor's income or both), other property-type income, indirect business taxes, employment, an implicit wage for the overall impact, household income, and public revenues (federal, state, and local taxes). Not often provided in impact assessments, SEBAS also generates estimates how RBS' loans and grants affect the distribution of household income by size, the occupational distribution of employment impacts, and the generation of various types of tax revenues.

Using SEBAS, one may choose form a great number of possible evaluation criteria. However, only a few will be addressed here. First, RBS may only want to consider a "single-valued" assessment criterion. Jobs (whether they only include direct jobs created or retained or they also include the indirect employment effects) provide a simply and relatively easily understood evaluation measure. However, concerns have arisen in the press surrounding recent "jobless" recovery cycles. There have been suggestions that employers are becoming more productive, meaning that business activities can expand without increasing employment. An alternative suggestion, that is also a "single-valued" assessment criterion, is to use a measure of created "wealth" or contributions to the gross domestic product (GDP). GDP would be able to address the benefits of RBS' loan and grant programs, even during "jobless" recoveries. Similarly, other indicators present themselves as "single-valued" assessment criteria. For example, total household income, the implicit impact wage rate, or tax revenues. However, economic analysts frequently consider contribution gross domestic product to provide the "best" alternative as a single-valued assessment criterion.

WHAT SEBAS DOES NOT DO?

SEBAS' benefits assessment is predicated on the user providing key information concerning a RBS loan or grant. A basic assumption underlying the SEBAS methodology is that the job and economic activity information entered

into the program either represents new jobs and activity for the regions being impacted due to the RBS loan or grant (i.e., the county, its neighbors, and the state) or the jobs and economic activity would otherwise leave the area without the loan or grant. It is difficult to know for certain if a RBS loan or grant is critical for the decision to undertake an activity or not. However, there are few alternatives to trusting the judgment of a loan or grant applicant in determining if a loan or grant is critical for a particular activity to actually occur.

Fortunately, geographically limiting the SEBAS models to only include the social and economic effects mitigates this problem to a large degree. At the national level it is frequently assumed that an economic activity will occur whether or not a particular loan or grant is acquired. There are many sources of investment funds and financial assistance. Sometimes higher interest rates are required to obtain the necessary financing, but the extra cost of is little reason to halt a good project. A project may not take place at a given location, it can occur elsewhere. When the geographic scale is lowered (for example, by only considering a specific state or sub-state area), a decision to undertake a project at a different location still means a loss for the region losing the investment.

CHAPTER 2: USING THE SOCIO-ECONOMIC BENEFITS ANALYSIS SYSTEM

WHAT YOU NEED TO KNOW TO BEGIN?

A SEBAS benefits assessment is predicated on the user providing key information concerning a RBS loan or grant. The accuracy of a SEBAS benefit assessment largely rests on the accuracy of the data provided by the firms in these survey tables. Ultimately, if the a SEBAS benefit assessment is made mandatory for the RBS loan and grant program then it will serve an applicant well to provide requested information.

The location of the firm needs to be determined. The firm's "location" is the county in which it operates. There may be occasions when a firm's owner has an administrative reporting office that is not located with its operation activities As an example, a firm's owner may perform administrative activities at a residence while the its operational activities are located elsewhere. The locations of the two functions can very well be in two different counties. It is important to determine the location of the firm's operational activities.

In addition, a SEBAS user is expected to have collected information describing the firm's workforce characteristics and its business operations related directly to the RBS loan or grant. Appendices A and B provide copies of questionnaires that have been designed to be used to collect these data for firms and institutions that are receive RBS loans and grants. The information requirements for SEBAS may seem overly burdensome, however, it is assumed that a RBS loan or grant applicant is knowledgeable about its operational activities and can estimate the values that are requested. However, the information requested in the survey forms is similar to the information that is require by the U.S. Census Bureau for its Economic Censuses every five years.

RUNNING SEBAS: AN INTERMEDIARY RELENDING LOAN IN BUTTE, MONTANA

A detailed case study is show here to demonstrate the operation and features of SEBAS using an Intermediate Relending Loan example. A firm in Butte, Montana used the funds of a RBS IRP loan to help position itself to accept and perform major governmental contracts. Currently, the firm currently employs 23 workers with an annual payroll of just over $2 million. The firm asserted that the loan was vital for its current operations and capabilities to perform the contracts that it gets. The firm expects that it will experience a major business expansion in the near future and will employ an additional 50 workers. The firm provided the workforce, revenue, and expense information necessary to perform a SEBAS benefit assessment.

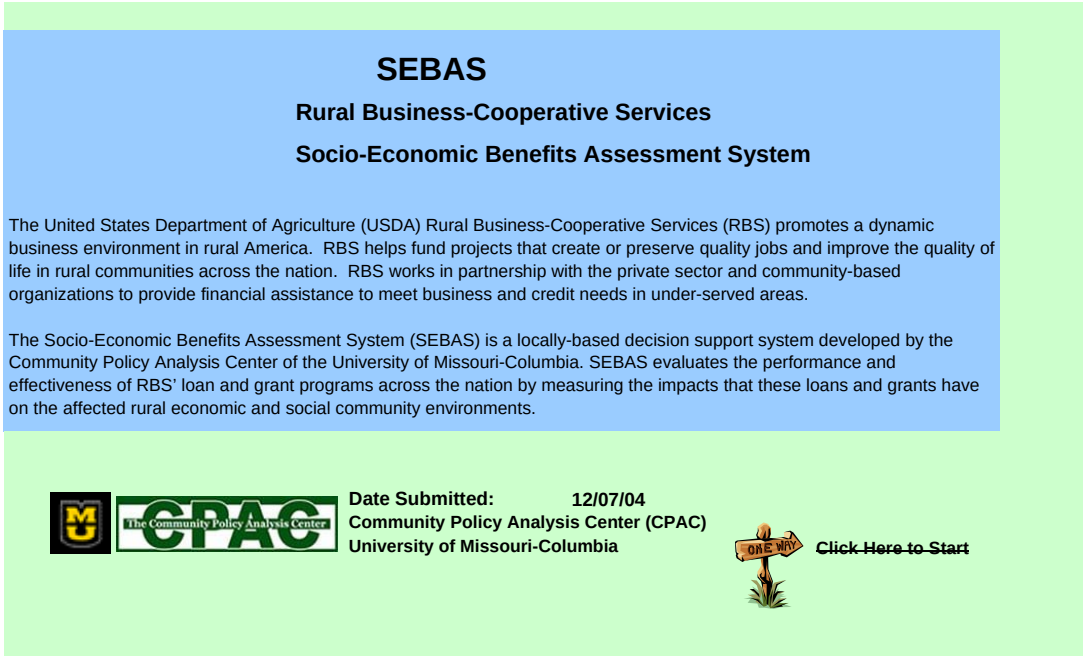


Figure 2.1: SEBAS Welcome Message

The current format and user access to SEBAS is through a series of spreadsheet programs—one for each state. This provides an easily understood and user-friendly format. The actual operation of SEBAS is quite convenient and simple. "Clicking on" the appropriate file in the location where SEBAS resides on your computer is all that is required to start a SEBAS evaluation session. After invoking SEBAS a user is placed in a "Welcome" sheet (Figure 2.1). One should start their SEBAS session from the Welcome sheet. If the Welcome sheet is not seen then it can be easily located.

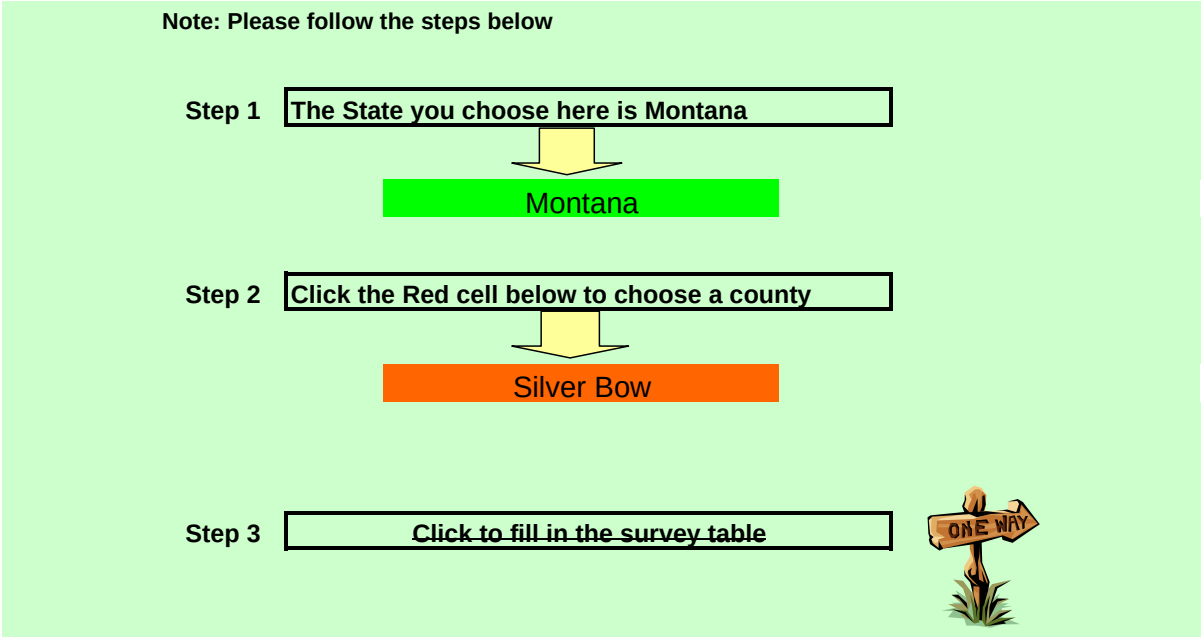


Figure 2.2: Selection of Geographic Region

The second step in operating SEBAS is to enter the "State&County" sheet (Figure 2.2) to select the appropriate state and county where the firm's Rural Business-Cooperative Business Services (RBS) loan or grant is being evaluated. Actually, only the appropriate county needs to be selected. Each county and its economic and social relationships with its surrounding neighboring counties and

state are the same. Consequently, no two counties will provide the same benefit assessment the same loan or grant information. Because the information is SEBAS is specific to the location where the firm is located, it is very important that the correct county be selected.

The third step in a SEBAS evaluation is to enter the "Survey" sheet and fill-in the RBS loan or grant survey information. This is the most difficult step in the benefits assessment process. It is important to provide in the requested information as accurately as possible. Three survey questionnaires need to be addressed by the user: (1) a Worker Survey, (2) a Sales Revenue Survey, and (3) a Business Expense Survey. The data entered into the survey forms should be relevant and related to the loan or grant received by the recipient.

Workers' Survey Table	○ LET THE PROGRAM ESTIMATE THE COMMUTING PERCENTAGES ◉ I KNOW THE COMMUTING PERCENTAGES AND WANT TO FILL IN THEM						
	# Jobs Created	Average Hours Worked per Week	Average # Weeks Employed per Year	Average Weekly Wages	Average Weekly Benefits	% Commuters from Outside County	My Estimation
Executive, Business and Finance	5	40	52	$1,964	$608	0.00%	0.00%
Professional and Technical	10	40	52	$1,337	$415	10.00%	10.00%
Service						0.00%	
Sales	4	40	52	$1,248	$387	25.00%	25.00%
Office and Administrative Support	3	17	52	$373	$116	0.00%	0.00%
Farming, Fishing and Forestry						0.00%	
Construction and Extraction						0.00%	
Installation, Maintance and Repair	1	15	52	$250	$78	0.00%	0.00%
Production Workers						0.00%	
Transportation & Material Moving						0.00%	
Total Jobs Created	23						

Figure 2.3: Worker Survey Table

The Worker Survey asks for data concerning the firm's workforce (Figure 2.3). A SEBAS user will need information on the following data items by occupational category: (1) the number of jobs created or retained because of the RBS loan or grant, (2) the average hours worked per week, (3) the average number of weeks employed during the year under consideration, (4) the average weekly wages, (5) the average weekly benefits, and (6) an estimate of what percentage of the workers who commute to their jobs from outside the county where the job is located. If this commuting percentage is not known or difficult to estimate, SEBAS can provide default values based on the county-specific commuting data from the 2000 Census of Population and Housing.

	Percent Sales to Buyers in			
Total Sales Revenue	**County(%)**	**Adjacent Counties (%)**	**Rest of State (%)**	**Elsewhere (%)**
$2,885,783				**100.00%**

Figure 2.4: Sales Revenue Survey

The Sales Revenue Survey asks for the level of sales revenues and an approximate geographic distribution of where it sold its products (Figure 2.4).

The firm's expense items and estimates of the geographic distribution of where purchased items are produced are entered into the Business Expense Survey (Figures 2.5 and 2.6). Again, if the geographic distribution information entered into Figure 2.6 is not available or is difficult to acquire, SEBAS can provide default values based on estimates of commodity trade between the county and other areas.

	Note: Please don't fill in information in	areas.				
Business Expense Survey		○ *Let the program estimate the geographic percentages*				
		◉ *I know the percentages and want to fill in them*				Click to fill in percentages
Purchase Requiredments Worksheet for Firms Receiving Rural Business Services (USDA) Loans or Grants						
#	Sector	Total Cost (including transportation)	Percent from			
			County(%)	Adjacent Counties(%)	Rest of State(%)	Elsewhere(%)
1	Crops		100.00%	0.00%	0.00%	0.00%
2	Livestock		100.00%	0.00%	0.00%	0.00%
3	Forestry and logging		100.00%	0.00%	0.00%	0.00%
4	Fishing, hunting and trapping		100.00%	0.00%	0.00%	0.00%
5	Petroleum and natural gas		100.00%	0.00%	0.00%	0.00%
6	Mined ores		100.00%	0.00%	0.00%	0.00%
7	Construction		100.00%	0.00%	0.00%	0.00%
8	Food, beverages and tobacco products		100.00%	0.00%	0.00%	0.00%
9	Textile products		100.00%	0.00%	0.00%	0.00%
10	Apparel		100.00%	0.00%	0.00%	0.00%
11	Leather and allied products		100.00%	0.00%	0.00%	0.00%
12	Wood products		100.00%	0.00%	0.00%	0.00%
13	Paper products		100.00%	0.00%	0.00%	0.00%
14	Refined petroleum and coal products		100.00%	0.00%	0.00%	0.00%
15	Chemical products		100.00%	0.00%	0.00%	0.00%
16	Plastics and rubber products		100.00%	0.00%	0.00%	0.00%
17	Mineral products		100.00%	0.00%	0.00%	0.00%
18	Metal products		100.00%	0.00%	0.00%	0.00%
19	Nonelectrical machinery and equipment		100.00%	0.00%	0.00%	0.00%
20	Computers and electronic components		100.00%	0.00%	0.00%	0.00%
21	Electircal appliances and equipment		100.00%	0.00%	0.00%	0.00%
22	Transportation equipment		100.00%	0.00%	0.00%	0.00%
23	Furniture and related products		100.00%	0.00%	0.00%	0.00%
24	Other manufactured goods	$42,400	100.00%	0.00%	0.00%	0.00%
25	Wholesale and retail trade		100.00%	0.00%	0.00%	0.00%
26	Transportation		100.00%	0.00%	0.00%	0.00%
27	Finance	$51,500	100.00%	0.00%	0.00%	0.00%
28	Insurance	$124,000	100.00%	0.00%	0.00%	0.00%
29	Real estate	$110,000	100.00%	0.00%	0.00%	0.00%
30	Utilities	$23,500	100.00%	0.00%	0.00%	0.00%
31	Agriculture and forestry services		100.00%	0.00%	0.00%	0.00%
32	Mining services		100.00%	0.00%	0.00%	0.00%
33	Printing and publishing services	$12,000	100.00%	0.00%	0.00%	0.00%
34	Internet and data process services		100.00%	0.00%	0.00%	0.00%
35	Motion picture and sound recording		100.00%	0.00%	0.00%	0.00%
36	Broadcasting		100.00%	0.00%	0.00%	0.00%

Figure 2.5: Business Expense Survey

Rental and leasing services		100.00%	0.00%	0.00%	0.00%
Scientific and technical consulting services	$100,267	0.00%	0.00%	25.00%	75.00%
Administrative and management support services	$36,645	100.00%	0.00%	0.00%	0.00%
Waste management and remediation services	$9,000	100.00%	0.00%	0.00%	0.00%
Educational services		100.00%	0.00%	0.00%	0.00%
Health care services		100.00%	0.00%	0.00%	0.00%
Recreation services		100.00%	0.00%	0.00%	0.00%
Hotels and other accomodations		100.00%	0.00%	0.00%	0.00%
Dining and drinking places		100.00%	0.00%	0.00%	0.00%
Repair and maintenance services		100.00%	0.00%	0.00%	0.00%
Personal and laundry services		100.00%	0.00%	0.00%	0.00%
Religious, grantmaking and similar organizations		100.00%	0.00%	0.00%	0.00%
Private households		100.00%	0.00%	0.00%	0.00%
Social assistance services		100.00%	0.00%	0.00%	0.00%
Post office		100.00%	0.00%	0.00%	0.00%
er Expenses					
Labor compensation	$2,013,180	Don't fill information in this black area			
Profits and dividends	$225,191				
Business taxes	$138,100				
Total	$2,885,783				

Click to view the impact table

Figure 2.5: Business Expense Survey (continued)

Business Expense Survey			Please fill in the percentage information here. Click here when you done, then fill in other information			
Purchase Requiredments Worksheet for Firms Receiving Rural Business Services (USDA) Loans or Grants						
#	Sector	Total Cost (including transportation)	Percent from			
			County(%)	Adjacent Counties(%)	Rest of State(%)	Elsewhere(%)
1	Crops	$0	100.00%			
2	Livestock	$0	100.00%			
3	Forestry and logging	$0	100.00%			
4	Fishing, hunting and trapping	$0	100.00%			
5	Petroleum and natural gas	$0	100.00%			
6	Mined ores	$0	100.00%			
7	Construction	$0	100.00%			
8	Food, beverages and tobacco products	$0	100.00%			
9	Textile products	$0	100.00%			
10	Apparel	$0	100.00%			
11	Leather and allied products	$0	100.00%			
12	Wood products	$0	100.00%			
13	Paper products	$0	100.00%			
14	Refined petroleum and coal products	$0	100.00%			
15	Chemical products	$0	100.00%			
16	Plastics and rubber products	$0	100.00%			
17	Mineral products	$0	100.00%			
18	Metal products	$0	100.00%			
19	Nonelectrical machinery and equipment	$0	100.00%			
20	Computers and electronic components	$0	100.00%			
21	Electircal appliances and equipment	$0	100.00%			
22	Transportation equipment	$0	100.00%			
23	Furniture and related products	$0	100.00%			
24	Other manufactured goods	$42,400	100.00%			
25	Wholesale and retail trade	$0	100.00%			
26	Transportation	$0	100.00%			
27	Finance	$51,500	100.00%			
28	Insurance	$124,000	100.00%			
29	Real estate	$110,000	100.00%			
30	Utilities	$23,500	100.00%			
31	Agriculture and forestry services	$0	100.00%			
32	Mining services	$0	100.00%			
33	Printing and publishing services	$12,000	100.00%			
34	Internet and data process services	$0	100.00%			
35	Motion picture and sound recording	$0	100.00%			
36	Broadcasting	$0	100.00%			
37	Rental and leasing services	$0	100.00%			
38	Scientific and technical consulting services	$100,267	0.00%		25.00%	75.00%
39	Administrative and management support services	$36,645	100.00%			
40	Waste management and remediation services	$9,000	100.00%			
41	Educational services	$0	100.00%			
42	Health care services	$0	100.00%			
43	Recreation services	$0	100.00%			
44	Hotels and other accomodations	$0	100.00%			
45	Dining and drinking places	$0	100.00%			
46	Repair and maintenance services	$0	100.00%			
47	Personal and laundry services	$0	100.00%			
48	Religious, grantmaking and similar organizations	$0	100.00%			
49	Private households	$0	100.00%			
50	Social assistance services	$0	100.00%			
51	Post office	$0	100.00%			
			Click here when you done, then fill in other information			

Figure 2.6: Spatial Distribution of Firm Expenses

Finally, the fourth step is to examine the benefits assessment results. The benefits assessment results are provided in two sheets, the “Impact Analysis” sheet and the “Chart” sheet. The Impact Analysis sheet provides the empirical estimates of a SEBAS benefits assessment and the Chart sheet shows a variety of graphical presentations (bar and pie charts) of the respective benefit assessment results. A SEBAS benefits assessment results are based on the user-provided information in the survey tables, which specifies the relevant characteristics of a RBS loan or grant, and the county- and sector-specific impact parameters that are embedded in the SEBAS spreadsheet program. It is recommended that the results of a SEBAS benefits assessment be saved—copy the empirical results and paste them to a new spreadsheet “by value” or paste them as a “picture” in a document. The charts should be copied and pasted as a picture in a document.

Figure 2.7 presents the values of the impact estimates by impact variable. Impact estimates are provided for the county in which the loan or grant recipient is located, the surrounding adjacent counties, and the remaining counties within the states. Summing across each row of Figure 2.7, SEBAS calculates the state’s total impacts. There is much useful information contained in this table: for example, information that summarizes the total effects that the loan grantee contributes to its community, to the surrounding area, and to the state. These overall effects can be measured in a variety of ways such as by business sales, income of workers, proprietors, and households, employment, and tax revenues. In addition, the distribution of household income and employment by occupational category are shown. Tax revenues are provided by major component.

Several measures of community develop are tabulated and presented, such as, wages and contributions to gross domestic product (GDP) per worker. These two values are also compared with corresponding current local values for

the areas considered in the form of ratios. These last two values are useful for determining whether the loan or grant applicant is likely to improve the local economic conditions. The example shown indicates that the contracting firm is likely to provide substantial contributions. Wages of employees at the firm and businesses indirectly affected are estimated to be approximately three times greater than locally existing wages. In addition, the associated contributions to GDP per worker are 50 percent higher that the local average.

In addition to the tabular information, SEBAS has the capability to present its impact estimates graphically (i.e., using pie and bar charts). The pie charts (Figure 2.8) show the geographic dispersion if the impact estimates for the county, the adjacent counties, and the rest of the state. Figure 2.9 provides two examples of distributional bar charts; one for the employment impacts by occupation and the other for tax revenues, Figure 2.9.

A user can begin another SEBAS benefits assessment by starting with the survey entry process (step three above) assuming that the next evaluation is for a firm located in the same county and state. If the next evaluation is for a firm located in a different county but the same state then the user should return to the county selection process (step two above). If the next evaluation is for a firm located in another state then the user should exit the current SEBAS spreadsheet and launch the appropriate state-specific SEBAS program.

Table 1: Impact by the Change of Final Demand in County **Silver Bow** ~~**Back to survey table**~~

	Impact for State Montana	County Silver Bow	Counties Adjacent to Silver Bow	Rest of the State	Whole State
Summary Impact Analysis	Business Sales (Output)	$3,219,167	$199,508	$441,776	$3,860,451
	Employee Compensation	$2,179,290	$134,261	$147,044	$2,460,595
	Proprietors' Income	$64,828	$4,515	$23,581	$92,924
	Other Property-Type Income	$258,042	$16,329	$56,513	$330,885
	Indirect Business taxes	$69,729	$4,613	$17,573	$91,915
	Employment	39.06	2.81	5.55	47.42
	Sum of Household Income	$1,678,285	$151,598	$186,313	$2,016,196
	Sum of Federal Taxes	$101,881	$6,285	$28,420	$136,586
	Sum of State&Local Taxes	$70,097	$3,637	$18,247	$91,982
Community Development Impact	Wages	$55,798	$47,744	$26,512	$51,895
	GDP conribution per worker	$65,850	$56,797	$44,122	$62,772
	Ratio of Wage to base	2.80	3.63	1.59	3.12
	Ratio of GDP conribution to base	1.56	1.61	1.32	1.86
Income Impact by Household Income Size	Households LT10K	$3,122	$943	$1,920	$5,984
	Households 10-15K	$7,140	$1,918	$3,798	$12,856
	Households 15-25K	$18,954	$5,688	$11,750	$36,393
	Households 25-35K	$24,056	$6,524	$15,802	$46,383
	Households 35-50K	$34,579	$11,331	$26,524	$72,435
	Households 50-75K	$60,816	$17,822	$41,157	$119,794
	Households 75-100K	$1,494,763	$98,142	$58,673	$1,651,577
	Households 100-150K	$20,120	$5,617	$15,376	$41,114
	Households 150K+	$14,736	$3,612	$11,314	$29,662
Employment Impact by Occupation	Executive, Business and Finance	6.96	0.13	0.51	7.60
	Professional and Technical	11.26	0.93	1.09	13.28
	Service	3.29	0.48	0.97	4.74
	Sales	5.42	0.82	0.87	7.11
	Office and Administrative Support	7.23	0.24	0.91	8.39
	Farming, Fishing and Forestry	0.06	0.01	0.17	0.25
	Construction and Extraction	0.27	0.02	0.17	0.47
	Installation, Maintance and Repair	1.81	0.06	0.25	2.12
	Production Workers	1.51	0.04	0.23	1.77
	Transportation & Material Moving	1.21	0.08	0.36	1.65
Fedral Tax Impact	Income Tax (Federal Tax)	$27,975	$1,713	$8,356	$38,044
	Other Federal Taxes	$26,714	$1,726	$6,306	$34,746
	Social Ins Tax (Federal Tax)	$47,192	$2,846	$13,758	$63,796
State & Local Tax Impact	Property Taxes (State&Local)	$38,501	$2,546	$9,716	$50,762
	Sales Taxes (State&Local)	$0	$0	$0	$0
	Income Taxes (State&Local)	$8,458	$518	$2,526	$11,503
	Other State & Local Taxes	$22,016	$507	$5,684	$28,207
	Social Ins Tax (State&Local)	$1,122	$67	$321	$1,510

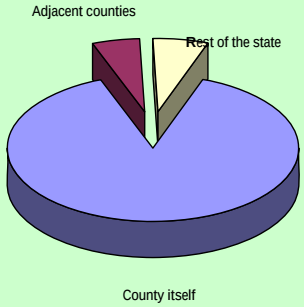
Figure 2.7: Impact Estimates

Impact Chart for State: Montana

County: Silver Bow

Please click the blue cell blew to choose the Category you want to view

Employee Compensation



Click to view some Column Charts for:
Income Impact by Household Income Size
Employment Impact by Occupations
Federal and Local&State Tax Impact

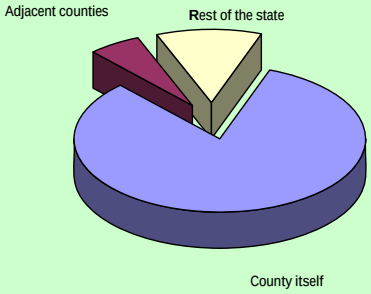
Back to the Impact Table
Back to choose another State & County
Back to the Survey Table

Impact Chart for State: Montana

County: Silver Bow

Please click the blue cell blew to choose the Category you want to view

Employment



Click to view some Column Charts for:
Income Impact by Household Income Size
Employment Impact by Occupations
Federal and Local&State Tax Impact

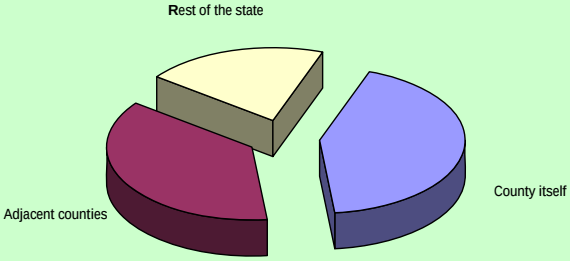
Back to the Impact Table
Back to choose another State & County
Back to the Survey Table

Impact Chart for State: Montana

County: Silver Bow

Please click the blue cell blew to choose the Category you want to view

Wages

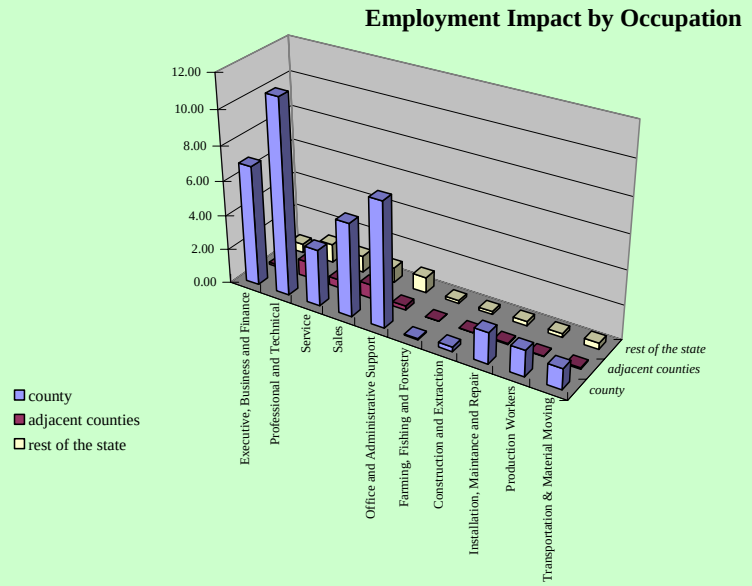


Click to view some Column Charts for:
Income Impact by Household Income Size
Employment Impact by Occupations
Federal and Local&State Tax Impact

Back to the Impact Table
Back to choose another State & County
Back to the Survey Table

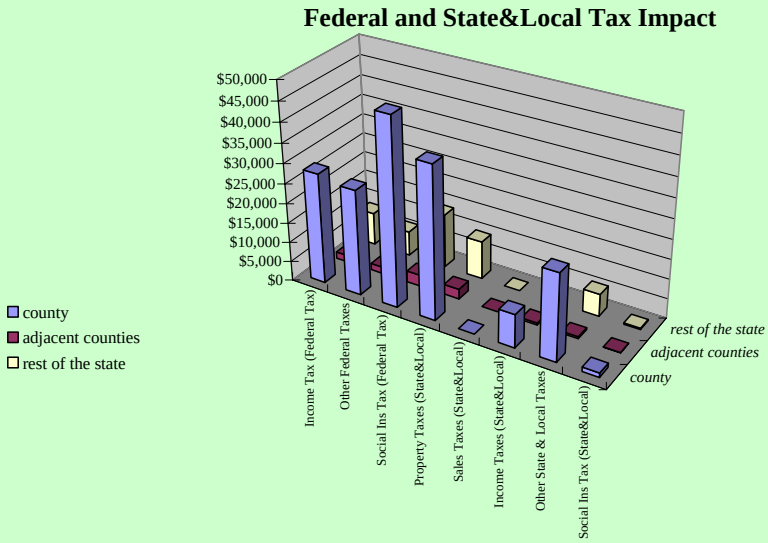
Figure 2.8: Geographic Pie Charts of Impact Estimates

BACK



Back to Top
Back to choose another State & County
Back to the Survey Table

BACK



Back to Top
Back to choose another State & County
Back to the Survey Table

Figure 2.9: Bar Charts for the Distributional Impact Estimates

TWO CASE STUDIES

Two recent RBS IRP loans provide additional illustrative examples of the efficacy of use of SEBAS. The two cases are from California during 2001. One is of a dairy farm located in Monterey County and the other is of a cut flower grower situated in San Benito County. Both recipients attested to the importance of the IRP loan for their continued business operations and the jobs that are supported by their activities. The firms' owners did not indicate where their workers resided. The commuting patterns of the two counties from the 2000 U.S. Census of Population were used to spatially distribute the firms' workers.

Table 2.1: Retained Direct Jobs and Weekly Salaries of Two IRP Loan Case Study Recipients—Dairy Farm and Flower Grower

	Monterey			Benito		
	Dairy Farm			**Flower Grower**		
Occupational Category	**FT**	**PT**	Weekly Wages*	**FT**	**PT**	Weekly Wages*
Executive, Business & Finance	**1**		**$1,567**	**1**		**$470**
Professional & Technical						
Service						
Sales						
Office and Administrative Support Occupations						
Farming, Fishing, and Forestry Occupations	**3**	**1**	**$560**	**2**	**1**	**$176**
Construction and Extraction Occupations						
Installation, Maintenance, and Repair Occupations						
Production Occupations						
Transportation and Material Moving Occupations						
Total	**4**	**1**		**3**	**1**	

The dairy farmer currently employs 3 full-time and 1 part-time farm workers and the cut flower grower employs 2 full-time and 1 part-time farm workers. In each case these are sole proprietor business. As a consequence, it is assumed that the owner is the executive agent of the respective business. Table 2.1 shows the direct jobs and the average weekly salaries of the direct

employees. Further it is assumed that full-time employees are paid for 52 40-hour weeks a year. The weekly salaries include employee benefits.

Table 2.2 shows the retained sales revenues of the two firms. The two recipients indicated that their continued business depended on receiving the IRP loans. Table 2.3 provides the retained business expense data for the two loan recipients. The products of the two firms were assumed to be sold outside the state. In both cases the spatial distribution of the business expenses were not known and was approximated by the sector trade flow parameters for the SEBAS SAM models for the respective counties.

Table 2.2: Retained Sales Revenues of Two IRP Loan Case Study Recipients—Dairy Farm and Flower Grower

	Monterey	San Benito
	Dairy Farm	Flower Grower
Retained Business Sales	$513,319	$97,500

Table 2.3: Retained Business Expenses of Two IRP Loan Case Study Recipients—Dairy Farm and Flower Grower

	Business Expense Category	Monterey Dairy Farm	San Benito Flower Grower
1	Crops		$3,250
2	Livestock		
3	Forestry and logging		
4	Fishing, hunting and trapping		
5	Petroleum and natural gas		
6	Mined ores		
7	Construction		
8	Food, beverages and tobacco products	$186,624	
9	Textile products		
10	Apparel		
11	Leather and allied products		
12	Wood products		
13	Paper products	$24,000	
14	Refined petroleum and coal products	$10,800	$3,900
15	Chemical products		$4,300
16	Plastics and rubber products		
17	Mineral products		
18	Metal products		
19	Nonelectrical machinery and equipment		
20	Computers and electronic components		
21	Electircal appliances and equipment		
22	Transportation equipment		
23	Furniture and related products		
24	Other manufactured goods	$23,400	$1,950
25	Wholesale and retail trade		
26	Transportation		
27	Finance		
28	Insurance	$3,600	$2,028
29	Real estate		
30	Utilities	$19,200	$5,200
31	Agriculture and forestry services		
32	Mining services		
33	Printing and publishing services		

Table 2.3: (continued)

	Business Expense Category	Monterey Dairy Farm	San Benito Flower Grower
34	Internet and data process services		
35	Motion picture and sound recording		
36	Broadcasting		
37	Rental and leasing services	$12,000	$1,895
38	Scientific and technical consulting services		$3,900
39	Administrative and management support services		
40	Waste management and remediation services		
41	Educational services		
42	Health care services		
43	Recreation services		
44	Hotels and other accomodations		
45	Dining and drinking places		
46	Repair and maintenance services	$6,000	$17,988
47	Personal and laundry services		
48	Religious, grantmaking and similar organizations		
49	Private households		
50	Social assistance services		
51	Post office		
	Employee Compensation	$84,000	$8,060
	Proprietor's Income	$99,344	$39,280
	Other Property Income	$32,111	$4,379
	Indirect Business Taxes	$12,240	$1,370
	Total	$513,319	$97,500

	Impact for State CA	County Monterey	Counties Adjacent to Monterey	Rest of the State	Whole State
Summary Impact Analysis	Business Sales (Output)	$449,925	$59,696	$278,438	$788,059
	Employee Compensation	$246,458	$22,000	$78,522	$346,980
	Proprietors' Income	$11,125	$2,020	$12,212	$25,356
	Other Property-Type Income	$43,548	$7,023	$45,266	$95,837
	Indirect Business taxes	$11,582	$1,994	$13,134	$26,710
	Employment	6.67	0.72	2.15	9.54
	Sum of Household Income	$154,208	$25,436	$94,464	$274,108
	Sum of Federal Taxes	$21,481	$3,845	$24,280	$49,606
	Sum of State&Local Taxes	$13,587	$2,295	$15,432	$31,315
Community Development Impact	Wages	$36,954	$30,430	$36,572	$36,373
	GDP conribution per worker	$46,888	$45,697	$69,459	$51,878
	Ratio of Wage to base	1.51	1.43	1.10	1.12
	Ratio of GDP conribution to base	0.95	1.14	1.11	0.85
Income Impact by Household Income Size	Households LT10K	$102	$189	$613	$904
	Households 10-15K	$200	$321	$1,025	$1,547
	Households 15-25K	$729	$1,037	$3,333	$5,100
	Households 25-35K	$1,168	$1,433	$5,004	$7,605
	Households 35-50K	$137,327	$10,022	$12,859	$160,208
	Households 50-75K	$4,693	$4,408	$19,612	$28,713
	Households 75-100K	$3,388	$2,909	$15,173	$21,471
	Households 100-150K	$3,766	$2,972	$18,996	$25,734
	Households 150K+	$2,833	$2,144	$17,848	$22,825
Employment Impact by Occupation	Executive, Business and Finance	1.10	0.10	0.23	1.42
	Professional and Technical	0.20	0.05	0.27	0.52
	Service	0.32	0.08	0.35	0.76
	Sales	0.27	0.05	0.24	0.57
	Office and Administrative Support	0.36	0.08	0.38	0.81
	Farming, Fishing and Forestry	3.73	0.24	0.13	4.10
	Construction and Extraction	0.02	0.01	0.04	0.07
	Installation, Maintance and Repair	0.13	0.02	0.10	0.25
	Production Workers	0.28	0.05	0.23	0.55
	Transportation & Material Moving	0.25	0.05	0.18	0.47
Fedral Tax Impact	Income Tax (Federal Tax)	$9,212	$1,678	$10,516	$21,407
	Other Federal Taxes	$4,252	$705	$4,581	$9,539
	Social Ins Tax (Federal Tax)	$8,016	$1,461	$9,183	$18,660
State & Local Tax Impact	Property Taxes (State&Local)	$3,548	$611	$4,024	$8,183
	Sales Taxes (State&Local)	$5,191	$894	$5,887	$11,973
	Income Taxes (State&Local)	$2,658	$484	$3,034	$6,177
	Other State & Local Taxes	$2,061	$282	$2,339	$4,682
	Social Ins Tax (State&Local)	$129	$23	$148	$301

Figure 2.10: Impacts Due to the IRP Loan for the Dairy Farm Monterey, CA

	Impact for State CA	County San Benito	Counties Adjacent to San Benito	Rest of the State	Whole State
Summary Impact Analysis	Business Sales (Output)	$85,199	$30,877	$47,130	$163,207
	Employee Compensation	$50,055	$16,665	$14,201	$80,921
	Proprietors' Income	$2,904	$1,203	$2,521	$6,628
	Other Property-Type Income	$8,582	$3,707	$8,193	$20,482
	Indirect Business taxes	$1,712	$1,025	$2,537	$5,274
	Employment	3.50	1.01	0.47	4.98
	Sum of Household Income	$31,294	$16,505	$19,014	$66,813
	Sum of Federal Taxes	$3,655	$1,989	$4,385	$10,029
	Sum of State&Local Taxes	$2,094	$1,126	$2,928	$6,148
Community Development Impact	Wages	$14,288	$16,563	$30,061	$16,243
	GDP conribution per worker	$18,055	$22,461	$58,111	$22,743
	Ratio of Wage to base	0.64	0.38	0.97	0.50
	Ratio of GDP conribution to base	0.41	0.29	0.98	0.37
Income Impact by Household Income Size	Households LT10K	$8	$38	$128	$174
	Households 10-15K	$29,186	$7,890	$1,079	$38,155
	Households 15-25K	$59	$217	$695	$972
	Households 25-35K	$93	$341	$1,037	$1,471
	Households 35-50K	$187	$679	$1,939	$2,805
	Households 50-75K	$468	$1,594	$3,984	$6,046
	Households 75-100K	$454	$1,424	$3,035	$4,913
	Households 100-150K	$537	$2,115	$3,711	$6,363
	Households 150K+	$302	$2,207	$3,405	$5,915
Employment Impact by Occupation	Executive, Business and Finance	0.81	0.22	0.06	1.10
	Professional and Technical	0.04	0.02	0.05	0.12
	Service	0.04	0.04	0.07	0.14
	Sales	0.04	0.02	0.04	0.10
	Office and Administrative Support	0.07	0.03	0.07	0.17
	Farming, Fishing and Forestry	2.34	0.64	0.08	3.06
	Construction and Extraction	0.01	0.00	0.01	0.02
	Installation, Maintance and Repair	0.07	0.01	0.02	0.11
	Production Workers	0.04	0.01	0.03	0.08
	Transportation & Material Moving	0.04	0.01	0.03	0.09
Fedral Tax Impact	Income Tax (Federal Tax)	$1,586	$872	$1,897	$4,355
	Other Federal Taxes	$756	$368	$851	$1,976
	Social Ins Tax (Federal Tax)	$1,313	$749	$1,636	$3,698
State & Local Tax Impact	Property Taxes (State&Local)	$525	$314	$777	$1,616
	Sales Taxes (State&Local)	$767	$459	$1,137	$2,364
	Income Taxes (State&Local)	$458	$252	$548	$1,257
	Other State & Local Taxes	$324	$89	$440	$853
	Social Ins Tax (State&Local)	$20	$12	$26	$58

Figure 2.12: Impacts Due to the IRP Loan for the Cut Flower Grower Benito, CA

OTHER USES OF SEBAS: TWO COMMERCIAL DEVELOPMENTS IN ASHE COUNTY, NORTH CAROLINA

In addition to evaluating the benefits of RBS local and grant applications, SEBAS is also capable of being used to strategically assessment the relative benefits of more than one option at a time. For example, to compare the relative merits of two loan applications. To illustrate this, of two different hypothetical commercial developments located in Ashe County, North Carolina are used. The hypothetical developments involve the reuse of two abandoned industrial plants and their grounds.

Each abandoned industrial site (buildings and grounds) covers about 500 acres with approximately one million square feet of floor space available for the development of various commercial activities. The two commercial developments include: (1) an industrial park and (2) a professional/office complex. The development alternatives consist of the following industrial activities:

Commercial Developments	Industrial Activities
(1) Industrial park	**Household furniture & musical instruments** **Motor freight & warehousing** **Cable TV station**
(2) Professional/office complex	**Computer & data processing services** **Management consulting services** **Cable TV station** **Recreational club** **Restaurant**

Table 2.4 provides the occupational distribution for the created jobs at the development activities. Business activity levels and expense data are given in

Table 2.5.[2] Although employment levels are higher in the case of the professional/office complex, industrial production levels (revenues and expenditures) are significantly higher for the industrial park development alternative.

Table 2.4: Jobs & Average Weekly Wages by Occupation Created Due to Alternative Develop Strategies in Ashe County, North Carolina

	Industrial Park		Office/Professional Complex	
Occupational Category	Jobs	Weekly Wages*	Jobs	Weekly Wages*
Executive, Business & Finance	39.4	$1,109	73.1	$930
Professional & Technical	19.2	$1,006	242.4	$844
Service	8.8	$543	169.4	$456
Sales	19.5	$510	36.1	$428
Office and Administrative Support Occupations	111.2	$480	185.2	$403
Farming, Fishing, and Forestry Occupations	6.1	$346	0.8	$290
Construction and Extraction Occupations	25.4	$625	4.1	$525
Installation, Maintenance, and Repair Occupations	32.7	$617	19.4	$517
Production Occupations	218.1	$487	11.7	$408
Transportation and Material Moving Occupations	218.6	$469	19.7	$393
Total	699.0		762.0	

*Average weekly wages include benefits working full time for 52 weeks a year

[2] Conversions of the jobs created estimates into business activity levels and expenditure distributions are based on local "output-per-worker" and "input-output" relationships for each sector in Ashe County. Data for these computations are available at the county-level in the IMPLAN SAM data bases.

Table 2.5: Business Expense Expenditures Due to Alternative Develop Strategies in Ashe County, North Carolina

		Industrial Park	Professional/Office Complex
1	Crops	$3,983,735	$739,085
2	Livestock	$4,828	$44,440
3	Forestry & logging	$4,103,808	$13,410
4	Fishing, hunting & trapping	$5,223,926	$12
5	Petroleum & natural gas	$0	$3,597
6	Mined ores	$87	$50
7	Construction	$1,162,152	$196,915
8	Food, beverages & tobacco products	$14	$26,268
9	Textile products	$153,521	$347,253
10	Apparel	$2,550	$20,699
11	Leather & allied products	$2,851	$18,580
12	Wood products	$29,423,284	$23,977
13	Paper products	$8,110,820	$23,169
14	Refined petroleum & coal products	$0	$0
15	Chemical products	$0	$0
16	Plastics & rubber products	$7,473	$421
17	Mineral products	$171,322	$66,615
18	Metal products	$315,793	$27,045
19	Nonelectrical machinery & equipment	$711,623	$99,526
20	Computers & electronic components	$597,470	$232,821
21	Electrical appliances & equipment	$578,928	$960,393
22	Transportation equipment	$127,392	$37,995
23	Furniture & related products	$484,373	$35,063
24	Other manufactured goods	$510,092	$183,503
25	Wholesale & retail trade	$2,175,486	$299,674
26	Transportation	$13,807,049	$662,556
27	Finance	$6,067,296	$641,934
28	Insurance	$1,115,771	$698,018
29	Real estate	$734,682	$452,220
30	Utilities	$731,087	$717,266
31	Agriculture & forestry services	$783,488	$134,561
32	Mining services	$0	$0
33	Printing & publishing services	$59,875	$166,540
34	Internet & data processing services	$589,650	$777,689
35	Motion picture & sound recording	$199,002	$189,706
36	Broadcasting	$555,093	$815,876
37	Rental & leasing services	$1,765,771	$2,145,153
38	Scientific & technical consulting services	$1,148,063	$1,462,967
39	Admin & management support services	$1,663,624	$1,553,699
40	Waste management & remediation services	$1,308,415	$1,297,974
41	Educational services	$209,746	$55,555
42	Health care services	$48,773	$43,009
43	Recreational services	$78,123	$1,235,546
44	Hotels & other accomodations	$312,959	$972,068
45	Dining & drinking places	$433,314	$338,282
46	Repair & maintenance services	$1,680,665	$226,597
47	Personal & laundry services	$1,646,838	$237,192
48	Religious, grantmaking & similar orgs	$74,487	$93,548
49	Private households	$35,820	$18,444
50	Social assistance services	$0	$10
51	Post office	$186,252	$45,361
	Employee Comp/Proprietor's Income	$19,654,149	$24,164,073
	Profits & Dividends	$5,498,744	$5,950,808
	Business Taxes	$1,869,095	$1,341,627
Total expenses		$120,109,357	$49,838,791

Figures 2.13 and 2.14 present comparisons of the regional economic impacts for the two alternative development scenarios using SEBAS. Consistent with the expected higher production levels with industrial park option, the economic impact estimates are substantially higher for the industrial park than for the professional/office complex. An interesting difference between the two development alternatives is shown in the comparison between the occupational distributions of employment, Figure 2.15.

Table 1: Impact by the Change of Final Demand in County **Ashe** **Back to survey table**

	Impact for State NorthCarolina	County Ashe	Counties Adjacent to Ashe	Rest of the State	Whole State
Summay Impacts	Output	$74,239,658	$2,725,739	$40,778,824	$117,744,221
	Employee Compensation	$27,590,078	$1,546,383	$11,303,606	$40,440,067
	Proprietor's Income	$1,534,493	$91,316	$1,725,828	$3,351,637
	Other Property-Type Income	$7,267,363	$380,938	$6,805,600	$14,453,900
	Indirect Business taxes	$1,752,642	$75,120	$2,142,216	$3,969,978
	Employment	1,156.26	59.60	464.88	1,680.73
	Wages	$23,862	$25,947	$24,315	$24,061
	Total Household Income	$15,298,740	$2,071,920	$12,965,686	$30,336,346
	Total Federal Taxes	$3,116,251	$127,936	$3,353,731	$6,597,918
	Total State&Local Taxes	$1,826,080	$72,656	$2,173,348	$4,072,084
Income Impact by Household Income Size	Households LT10K	$28,226	$19,938	$129,178	$177,342
	Households 10-15K	$47,347	$27,775	$197,905	$273,026
	Households 15-25K	$137,765	$86,276	$684,994	$909,036
	Households 25-35K	$14,004,038	$1,053,522	$1,219,845	$16,277,404
	Households 35-50K	$283,684	$213,272	$1,870,749	$2,367,704
	Households 50-75K	$414,853	$319,721	$3,397,127	$4,131,701
	Households 75-100K	$143,161	$150,071	$2,020,140	$2,313,372
	Households 100-150K	$109,786	$103,878	$1,921,269	$2,134,933
	Households 150K+	$129,880	$97,469	$1,524,480	$1,751,829
Employment Impact by Occupation	Executive, Business and Finance	84.59	4.04	42.49	131.12
	Professional and Technical	66.86	3.34	46.90	117.09
	Service	72.67	4.17	74.26	151.10
	Sales	70.12	3.60	43.39	117.11
	Office and Administrative Support	191.99	9.65	76.51	278.15
	Farming, Fishing and Forestry	32.28	1.84	53.85	87.96
	Construction and Extraction	42.74	1.78	10.42	54.94
	Installation, Maintance and Repair	55.89	2.79	21.59	80.27
	Production Workers	270.11	13.99	34.84	318.94
	Transportation & Material Moving	268.28	14.38	59.81	342.46
Fedral Tax Impact	Income Tax (Federal Tax)	$1,024,821	$40,656	$1,109,034	$2,174,511
	Other Federal Taxes	$784,154	$37,577	$834,620	$1,656,351
	Social Ins Tax (Federal Tax)	$1,307,276	$49,704	$1,410,077	$2,767,056
State & Local Tax Impact	Property Taxes (State&Local)	$475,380	$20,363	$580,504	$1,076,247
	Sales Taxes (State&Local)	$731,708	$31,362	$894,351	$1,657,421
	Income Taxes (State&Local)	$346,711	$13,754	$375,201	$735,666
	Other State & Local Taxes	$257,991	$6,653	$307,918	$572,561
	Social Ins Tax (State&Local)	$14,290	$525	$15,374	$30,188

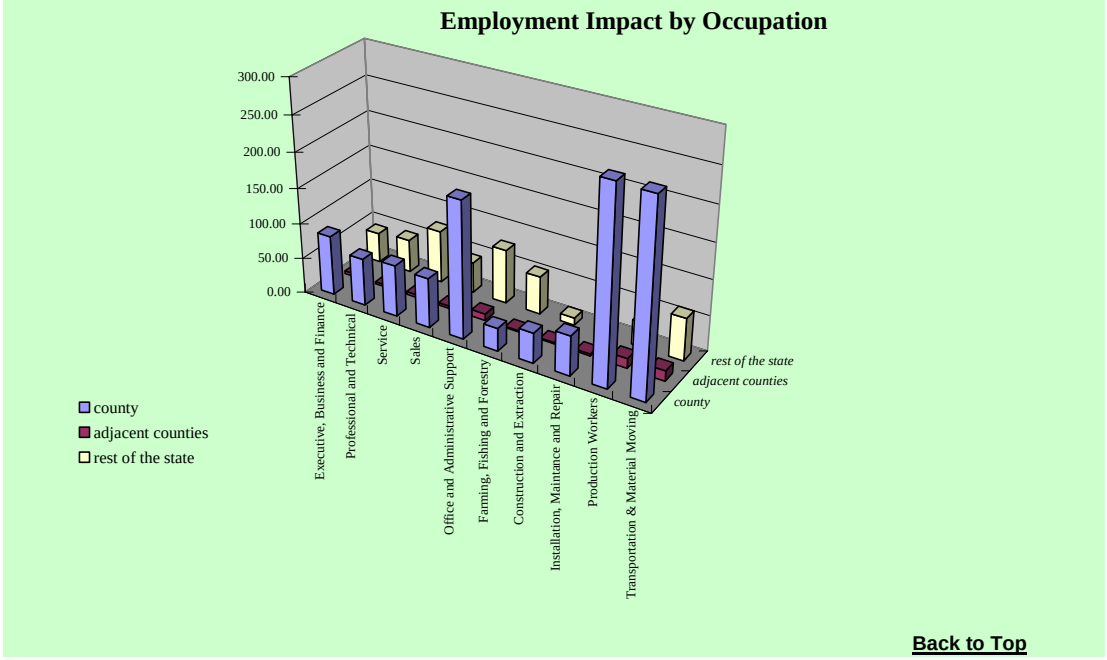
Figure 2.12: Impact Estimates for the Hypothetical Industrial Park in Ashe County, North Carolina

Table 1: Impact by the Change of Final Demand in County **Ashe** **Back to survey table**

	Impact for State NorthCarolina	County Ashe	Counties Adjacent to Ashe	Rest of the State	Whole State
Summay Impacts	Output	$34,838,705	$2,363,471	$12,387,525	$49,589,701
	Employee Compensation	$24,786,728	$1,691,257	$3,701,466	$30,179,451
	Proprietor's Income	$754,215	$43,045	$468,174	$1,265,435
	Other Property-Type Income	$2,627,649	$193,962	$2,177,564	$4,999,174
	Indirect Business taxes	$631,641	$53,248	$674,228	$1,359,118
	Employment	890.71	57.33	128.78	1,076.82
	Wages	$27,828	$29,501	$28,742	$28,026
	Total Household Income	$17,758,861	$1,674,994	$4,146,484	$23,580,339
	Total Federal Taxes	$1,112,560	$80,571	$1,035,248	$2,228,379
	Total State&Local Taxes	$658,377	$48,078	$679,413	$1,385,868
Income Impact by Household Income Size	Households LT10K	$14,563	$9,264	$39,872	$63,698
	Households 10-15K	$24,413	$12,928	$61,060	$98,401
	Households 15-25K	$70,951	$40,088	$211,113	$322,153
	Households 25-35K	$17,092,686	$1,204,100	$538,589	$18,835,374
	Households 35-50K	$145,972	$98,835	$575,818	$820,624
	Households 50-75K	$213,423	$147,953	$1,044,146	$1,405,522
	Households 75-100K	$73,539	$69,134	$619,855	$762,527
	Households 100-150K	$56,446	$47,726	$588,652	$692,825
	Households 150K+	$66,869	$44,966	$467,379	$579,214
Employment Impact by Occupation	Executive, Business and Finance	86.63	5.37	12.15	104.14
	Professional and Technical	248.60	16.10	17.20	281.90
	Service	201.63	12.98	26.18	240.79
	Sales	57.73	4.03	15.30	77.06
	Office and Administrative Support	202.63	13.09	24.50	240.23
	Farming, Fishing and Forestry	7.82	0.42	1.87	10.11
	Construction and Extraction	7.43	0.39	3.15	10.97
	Installation, Maintance and Repair	27.39	1.72	6.81	35.92
	Production Workers	19.53	1.23	10.22	30.98
	Transportation & Material Moving	30.64	1.97	11.10	43.71
Fedral Tax Impact	Income Tax (Federal Tax)	$370,691	$25,788	$337,493	$733,972
	Other Federal Taxes	$283,124	$22,201	$264,610	$569,935
	Social Ins Tax (Federal Tax)	$458,746	$32,582	$433,145	$924,472
State & Local Tax Impact	Property Taxes (State&Local)	$171,329	$14,423	$182,660	$368,413
	Sales Taxes (State&Local)	$263,703	$22,231	$281,483	$567,416
	Income Taxes (State&Local)	$125,410	$8,724	$114,179	$248,313
	Other State & Local Taxes	$93,042	$2,347	$96,334	$191,723
	Social Ins Tax (State&Local)	$4,893	$353	$4,758	$10,004

Figure 2.13: Impact Estimates for the Hypothetical Professional/Office Complex in Ashe County, North Carolina

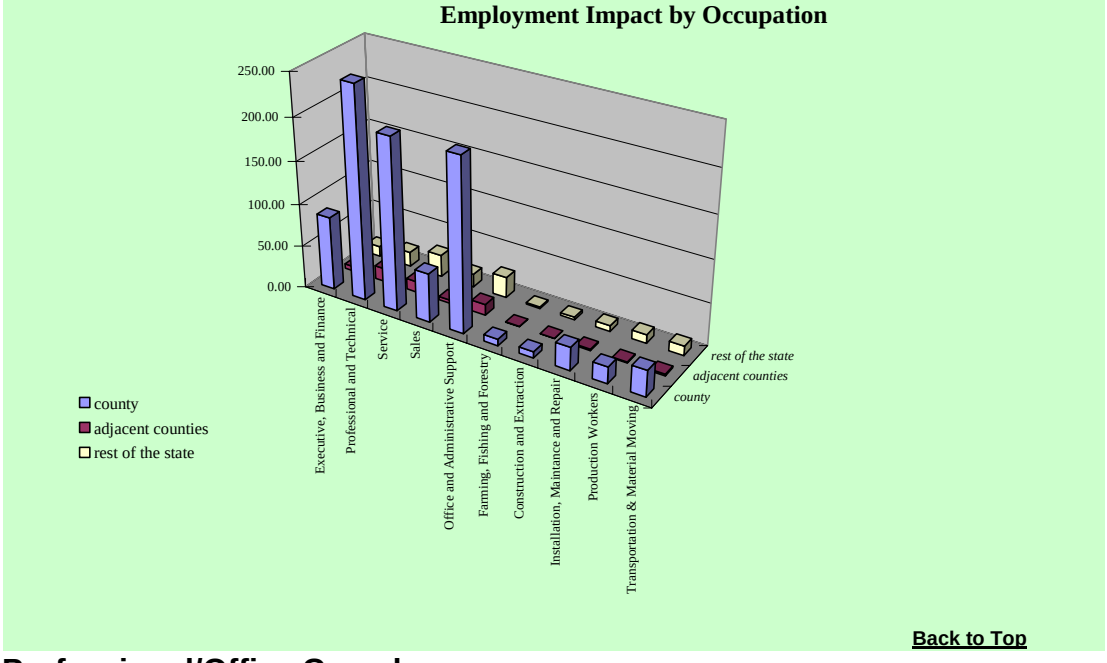
BACK



Back to Top

Industrial Park

BACK



Back to Top

Professional/Office Complex

Figure 2.14: Comparison of Employment Impact Estimates in Ashe County, North Carolina: Hypothetical Industrial Park vs Professional/Office Complex

CHAPTER 3: RECOMMENDATIONS

PROPOSAL TO IMPROVE RBS' REPORTING CRITERIA

RBS reports jobs either created or retained by its loan and grant recipients. These "direct" jobs increases are very frequently used by many federal and state agencies as a measure of their performance. However, the "number of jobs created" is considered a poor indicator of impact. But, it does permit comparisons with previous measurements and other agencies. Consequently, it is proposed that RBS also report a range of other values in addition to the currently reported direct jobs. This list includes:

1. Direct jobs
2. Direct full-time equivalent employment
3. Total full-time equivalent employment
4. Total gross domestic product
5. Total gross domestic product per full-time worker

Reporting jobs gives weights part-time and full-time jobs equally. It is recommended that jobs estimates be adjusted to reflect full-time equivalency (FTE). This would provide a performance measure that doesn't penalize employers that provide seasonal and part-time work. FTE rewards employers that produce full-time jobs compared to part-time jobs.

Employment is also a narrow measure of economic performance. Alternatively, it is recommended that RBS also report its contributions to gross domestic product (GDP). GDP is the broadest available measure of income. It is the sum of four impact variables estimated by SEBAS: employee compensation (wages and salaries plus employee benefits), proprietors' income, other property-type income (profits, dividends, interest, rents, etc.), and indirect business taxes.

The objective of RBS is to create economic opportunities in rural areas. The local linkages between sectors are critical for the economic well-being of

rural communities. Total economic effects (including multiplier effects) help to detect possible shifts in the activities of other sectors. It is proposed that RBS report total as well as direct economic changes. Finally, the "quality" of the jobs created by RBS loans and grants should be a very important factor in determining the success of its performance. Those employers that pay higher wages, more benefits, and contribute to taxes will contribute more to a rural community's welfare. This factor can be measured by the ratio of GDP to FTE or the "GDP per worker" ratio.

Table 3.1: Five Proposed Performance Indicators for Case Studies

		County	Adjacent Counties	Remainder of State	State Total
Gov't Contractor	Direct jobs	23			
	Direct FTE employment	19.3			
	Total FTE employment	32.7	2.4	4.7	39.9
	Total GDP	$2,571,889	$159,718	$244,711	$2,976,318
	GDP/FTE	$78,620.39	$65,900.46	$51,720.91	$74,654.78
Dairy Farm	Direct jobs	5			
	Direct FTE employment	4.3			
	Total FTE employment	5.8	0.6	1.8	8.2
	Total GDP	312712.5716	33037.23064	149133.9365	494883.7388
	GDP/FTE	$54,205.38	$52,525.46	$81,239.12	$60,104.31
Cut Flower Grower	Direct jobs	4			
	Direct FTE employment	3.5			
	Total FTE employment	3.1	0.9	0.4	4.4
	Total GDP	63252.47235	22599.71013	27452.00731	113304.1898
	GDP/FTE	$20,400.74	$25,817.41	$67,965.62	$25,869.86
Industrial Park	Direct jobs	699			
	Direct FTE employment	623.9			
	Total FTE employment	1,032.0	51.6	403.3	1,486.8
	Total GDP	38144576	2093757	21977250	62215583
	GDP/FTE	$36,963.16	$40,612.89	$54,495.80	$41,845.31
Office Complex	Direct jobs	762			
	Direct FTE employment	680.1			
	Total FTE employment	795.0	49.6	111.7	956.3
	Total GDP	28800233	1981512	7021432	37803177
	GDP/FTE	$36,228.59	$39,957.53	$62,850.36	$39,532.08

Table 3.1 compares these five proposed RBS performance indicators for the case studies illustrated in this report.

AN OPPORTUNITY FOR EVALUATING RURAL ECONOMIC DEVELOPMENT

The five performance indicators provide a broad picture of how RBS loan and grant recipients are affected their rural communities and regions. In addition, it is recommended that RBS consider measures of how their loans and grants are improving the affect rural communities. Two possible measure of economic social improvement are the implicit impact wage and GDP per worker ratios relative to the "base level" values of these two indicators for the respective counties, adjacent counties, rest of the state, and the entire state. Table 3.2 shows these values for three of the case studies.

Table 3.2: Contributions to Gross Domestic Product per Worker and Wage Impacts for Three Cases and Comparisons with Base Levels

Impact Scenario			County	Adjacent Counties	Rest of State	Whole State
Gov't Contracting Firm: Butte, Montana						
	Impact	GDP per Worker	$65,845	$56,839	$44,092	$62,765
		Wage	$55,798	$47,744	$26,512	$51,895
	Relative to Base	GDP per Worker	1.26	1.36	1.40	1.86
		Wage	2.21	2.36	1.69	3.12
Industrial Park: Ashe County, NC						
	Impact	GDP per Worker	$32,990	$35,130	$47,275	$37,017
		Wage	$23,862	$25,947	$24,315	$24,061
	Relative to Base	GDP per Worker	0.92	0.96	1.00	0.79
		Wage	1.47	1.28	0.95	0.95
Professional Complex: Ashe County, NC						
	Impact	GDP per Worker	$32,334	$34,563	$54,523	$35,106
		Wage	$27,828	$29,501	$28,742	$28,026
	Relative to Base	GDP per Worker	0.90	0.94	1.16	0.75
		Wage	1.72	1.45	1.13	1.10

The impact on wages and contribution to GDP relative to their base values is far greater for the government contracting firm in Butte, Montana is far greater than that for either of the two commercial developments in Ashe County, North Carolina. To a large extent, this result occurred because of the "high wage" and technical nature of the contracting firm's employees. The two commercial developments provide interesting contrasts. For example, the impact on the contribution to GDP per worker for the industrial park was lower than for all respective base level values. However, the impact on the contribution to GDP due to the professional/office complex was higher than the base level value for the rest of the state area. The wage impact for the industrial park is greater than the base level for the county and adjacent counties but lower for the rest of the state and the state as a whole. On the other hand, the wage impact for the professional/office complex is higher than the base levels for all geographic levels.

EXPAND SEBAS GEOGRAPHICALLY

Currently SEBAS is configured to provide impact estimates for five states (California, Montana, North Carolina, New Hampshire, and Vermont). This includes an area containing 238 counties. All fifty (50) states should be included to make SEBAS complete.

However, expanding SEBAS to encompass the entire nation raises several thorny issues. First, the current version of SEBAS stops at a state's boundary. That is, the counties which are located on the edge of do not have neighboring counties or remaining portions of the state completely surrounding them. This causes a downward bias, to some extent, in the resulting SAM multipliers relative to those counties that are surrounded by neighboring counties and remaining portions of the state. To some extent the regional relationships are incomplete, consequently, the economic interrelationships to be "*short-circuited*". This can be corrected by considering variations of "nodal" regional

patterns for the boundary counties. A general discussion of defining regions can be found in Appendix E.

FORMAT AND USER ACCESS TO SEBAS

Current format and user access to SEBAS is through a spreadsheet program. This provides an easily understood and user-friendly format. The actual operation of SEBAS is quite convenient and simple. However, loading the program is a bit slow and computer space requirements are somewhat voluminous (currently, almost 150 Mbytes). Expanding SEBAS to include the entire nation will make these issues more critical. Possible options for SEBAS' format and user access include:

1. **Current format and user access.** Don't change either the format or user access.

2. **"RBS' own" impact database.** Currently SEBAS is based on the IMPLAN input-output modeling system. The IMPLAN database is available commercially at a cost of $30,000 for each year it is updated. This cost only includes the databases, not the cost of processing to access and use the data. Alternatively, RBS could use the RIMS system available through the U.S. Bureau of Economic Analysis. Or, a custom-made database system could be constructed for RBS. These cost issues need to be addressed every time the SEBAS databases are updated.

3. **"Models on the fly".** Currently, SEBAS contains impact models that have already been compiled and included in the SEBAS program. This is one of the reasons that the SEBAS program is so large. An alternative is to store the models in a separate database file and access only that model requested by the user.

4. **Web access.** SEBAS uses a spreadsheet for a personal computer. Alternatively, access to SEBAS could be made available through a website.

REFERENCES

Holland, David and Wyeth, Peter. 1993. “SAM Multipliers: Their Interpretation and Relationship to Input-Output Multipliers.” Edited by Daniel M. Otto and Thomas G. Johnson in *Microcomputer-Based Input-Output Modeling: Applications to Economic Development*. Boulder, CO: Westview Press, 181-197.

King, Benjamin B. 1985. “What is a SAM?” Edited by Graham Pyatt and Jefferey I. Round in *Social Accounting Matrices: A Basis for Planning*. Washington, DC: The World Bank, 17-51.

Miller, Ronald E. and Blair, Peter D. 1985. *Input-Output Analysis: Foundations and Extensions*. Englewood Cliffs, NJ: Prentice-Hall, Inc.

Minnesota IMPLAN Group, Inc. (MIG). 1998. *Elements of the Social Accounting Matrix, MIG IMPLAN Technical Report TR-98002*. Stillwater, MN: Minnesota IMPLAN Group, Inc.

Minnesota IMPLAN Group, Inc. (MIG). 2000. *IMPLAN Professional, Version 2.0: Social Accounting & Impact Analysis Software, 2nd Edition*. Stillwater, MN: Minnesota IMPLAN Group, Inc. (June).

Pyatt, Graham and Round, Jefferey I. 1985. “Regional Accounts in a SAM Framework.” Edited by Graham Pyatt and Jefferey I. Round in *Social Accounting Matrices: A Basis for Planning*. Washington, DC: The World Bank, 84-95.

Round, Jeffery. 2003. “Social Accounting Matrices and SAM-Based Multiplier Analysis. Edited by Francois Bourguignon and Luiz A. Pereira da Silva in *Evaluating the Poverty and Distributional Impact of Economic Policies (Techniques and Tools)*. Washington, DC: The World Bank, in draft (March).

APPENDIX A

USDA RBS LOAN PROGRAM
BENEFIT ASSESSMENT QUESTIONNAIRE

USDA RBS Loan Program
Benefit Assessment Questionnaire

The following information is needed from each borrower participating in a USDA Rural Business-Cooperative Services loan program. This information will only be used to evaluate the efficacy of the Rural Business-Cooperative Services programs. This research will produce information on the operation, performance, and effectiveness of the RBS programs toward the goal of improving the economic well being of rural people and communities.

Notes and explanations:

- The information provided below should refer to only one type of RBS loan (either a Business and Industry Loan or an Intermediary Relending Loan). If you receive more than one type of RBS loan, please copy this questionnaire to respond for the other type of loan that you receive.
- Please provide the following information for the preceding fiscal year starting October 1 and ending September 30.
- Report the employment, sales and expenses of the part of your business that is attributable to the USDA funds. If this is a start-up activity, then report all employment, sales and expenses.
- If you do not have exact figures, please provide your best estimates.
- If the geographic distribution information can not reasonably be gathered, please leave it blank.
- If the information asked does not apply to you, please leave it blank.
- Do not enter information in shaded areas of the table.
- The percentages should add up to 100% across each row of the table.
- Be sure that "Total sales revenues" are equal to "Total expenses".

Definitions:

- "Total Costs" of expense items should include any transportation charges to your business.
- "County" refers to the county where the borrower is located.
- "Adjacent Counties" refers to the counties that are adjacent to the county where the borrower is located.
- "Rest of State" refers to areas of the state where the borrower is located, other than the home county and the adjacent counties.
- "Elsewhere" refers to all places outside the state where the borrower is located.

Name of Business:

_____

Address:

_____
_____
_____

Telephone Number: _____
E-mail: _____

1. Which RBS loan program does the information in this questionnaire refer to:

   Business and Industry Loan Program: _____
   Intermediary Relending Loan Program: _____

2. What is the likelihood that this project would have occurred without USDA Funds?

   ___ Not possible without USDA funds.
   ___ Possible, but fewer jobs would have been created.
   ___ Possible, but the time frame would have been delayed.
   ___ Possible, but not at this location.

3. Briefly how the RBS loan program has impacted your business.

4. Employment and compensation

Occupational Groups	# Jobs Created	Average Hours Worked Per Week*	Average # Weeks Employed per Year	Average Weekly Wages	Average Weekly Benefits	% Commuters from Outside County
Executive, Business and Finance						%
Professional and Technical						%
Service						%
Sales						%
Office and Administrative Support						%
Farming, Fishing and Forestry						%
Construction and Extraction						%
Installation, Maintenance and Repair						%
Production Workers						%
Transportation & Material Moving						%

***If seasonal or periodic, report average hours worked while employed.**

5. Sales

	Percent Sales to Buyers in			
Total Sales Revenue	County	Adjacent Counties	Rest of State	Elsewhere
	%	%	%	%

6. Expenses (can be continued on another page)

Expense Items	Total Cost (including transportation)	Percent from			
		County	Adjacent Counties	Rest of State	Elsewhere
Labor compensation					
Profits and dividends					
Business taxes					
Finance		%	%	%	%
Insurance		%	%	%	%
Real estate		%	%	%	%
Utilities		%	%	%	%
Construction		%	%	%	%
Raw materials*: *specify*					
		%	%	%	%
		%	%	%	%
		%	%	%	%
		%	%	%	%
Manufactured goods*: *specify*					
		%	%	%	%
		%	%	%	%
		%	%	%	%
		%	%	%	%
		%	%	%	%
		%	%	%	%
		%	%	%	%
		%	%	%	%
		%	%	%	%
Services*: *specify*					
		%	%	%	%
		%	%	%	%
		%	%	%	%
		%	%	%	%
		%	%	%	%
		%	%	%	%
		%	%	%	%
		%	%	%	%
		%	%	%	%
Total expenses					

APPENDIX B

Rural Economic Grant Program
Benefit Assessment Questionnaire

Rural Economic Grant Program Benefit Assessment Questionnaire

The following information is needed from each recipient participating in a USDA Rural Business-Cooperative Services (RBS) Grant program. The intention of this questionnaire is to produce information on the operation, performance, and effectiveness of the RBS programs toward the goal of improving the economic well being of rural people and communities. Please take a few minutes to complete the following four questions.

Notes and explanations:

- The information provided below should refer to only one type of RBS grant. If you receive more than one type of RBS grant, please copy this questionnaire to respond for the other types of grants that you receive.
- Please provide the above information for the preceding fiscal year starting October 1 and ending September 30.
- If you do not have exact figures, please provide your best estimates.
- If the information asked does not apply to you, please leave it blank.
- "Jobs created" are new jobs that are created by new activities or expansions of existing activities.

Name of Grant Recipient:

_____

Address:

_____
_____
_____

Telephone Number: _____
E-mail: _____

1. What type of USDA RBS Grant do the responses in this questionnaire refer to:

   Rural Economic Development (ED) Grant: _____
   Rural Business Enterprise (RBEG) Grant: _____
   Rural Business Opportunity (RBOG) Grant: _____

2. Briefly describe what the impact the Rural Economic Development Grant has been on your project.

_____
_____
_____
_____
_____
_____
_____
_____
_____

3. Briefly describe what the impact of your project has been on your community and/or region.

_____
_____
_____
_____
_____
_____
_____
_____
_____

4. Does your project tie into a regional/larger plan? If so, then how?

_____
_____
_____
_____
_____
_____
_____
_____
_____

5. Please complete the following table of measurements to document the impact of the Rural Economic Development Grant on your community and/or region. Complete only those measurements that apply to your project.

Measurement	Results
Number of grants	
Number of new businesses created	
Number of existing businesses expanded	
Number of businesses assisted	
Private dollars leveraged	
Number of full-time jobs created	
Number of full-time jobs retained	
Cost reductions	
Product line expansion(s)	
Increase in energy efficiency	
Increase in local purchasing	

Thank you!

APPENDIX C

RBS COUNTIES AND THEIR NEIGHBORING COUNTIES: CALIFORNIA, MONTANA, NORTH CAROLINA, NEW HAMPSHIRE, AND VERMONT

Table C: RBS Counties and Their Neighbors in California, Montana, New Hampshire, North Carolina, and Vermont

County	Neighboring Counties								
alameda ca	contra costa ca	san joaquin ca	stanislaus ca	santa clara ca	san mateo ca	san francisco ca			
alpine ca	el dorado ca	amador ca	calaveras ca	tuolumne ca	mono ca				
amador ca	el dorado ca	alpine ca	calaveras ca	san joaquin ca	sacramento ca				
butte ca	tehama ca	plumas ca	yuba ca	sutter ca	colusa ca	glenn ca			
calaveras ca	amador ca	alpine ca	tuolumne ca	stanislaus ca	san joaquin ca				
colusa ca	lake ca	glenn ca	butte ca	sutter ca	yolo ca				
contra costa ca	solano ca	sacramento ca	san joaquin ca	alameda ca	san francisco ca				
del norte ca	siskiyou ca	humboldt ca							
el dorado ca	placer ca	sacramento ca	amador ca	alpine ca					
fresno ca	monterey ca	san benito ca	merced ca	madera ca	mono ca	inyo ca	tulare ca	kings ca	
glenn ca	tehama ca	butte ca	colusa ca	lake ca	mendocino ca				
humboldt ca	del norte ca	siskiyou ca	trinity ca	mendocino ca					
imperial ca	riverside ca	san diego ca							
inyo ca	mono ca	fresno ca	tulare ca	kern ca	san bernardino ca				
kern ca	kings ca	tulare ca	inyo ca	san bernardino ca	los angeles ca	ventura ca	santa barbara ca	san luis obispo ca	monterey ca
kings ca	monterey ca	fresno ca	tulare ca	kern ca	san luis obispo ca				
lake ca	mendocino ca	glenn ca	colusa ca	yolo ca	napa ca	sonoma ca			
lassen ca	modoc ca	shasta ca	plumas ca	sierra ca					
los angeles ca	ventura ca	kern ca	san bernardino ca	orange ca					
madera ca	mariposa ca	tuolumne ca	mono ca	fresno ca	merced ca				
marin ca	sonoma ca	san francisco ca	san mateo ca						
mariposa ca	tuolumne ca	madera ca	merced ca	stanislaus ca					
mendocino ca	humboldt ca	trinity ca	tehama ca	glenn ca	lake ca	sonoma ca			
merced ca	stanislaus ca	tuolumne ca	mariposa ca	madera ca	fresno ca	san benito ca	santa clara ca		
modoc ca	siskiyou ca	shasta ca	lassen ca						
mono ca	alpine ca	tuolumne ca	madera ca	fresno ca	inyo ca				
monterey ca	santa cruz ca	san benito ca	fresno ca	kings ca	kern ca	san luis obispo ca			
napa ca	lake ca	yolo ca	solano ca	san francisco ca	sonoma ca				
nevada ca	sierra ca	yuba ca	placer ca						
orange ca	los angeles ca	san bernardino ca	riverside ca	san diego ca					
placer ca	nevada ca	yuba ca	sutter ca	sacramento ca	el dorado ca				
plumas ca	sierra ca	yuba ca	butte ca	tehama ca	shasta ca	lassen ca			
riverside ca	san bernardino ca	los angeles ca	orange ca	san diego ca	imperial ca				
sacramento ca	sutter ca	placer ca	el dorado ca	amador ca	san joaquin ca	contra costa ca	solano ca	yolo ca	
san benito ca	santa cruz ca	santa clara ca	merced ca	fresno ca	monterey ca				
san bernardino ca	inyo ca	kern ca	los angeles ca	orange ca	riverside ca				
san diego ca	imperial ca	riverside ca	orange ca						
san francisco ca	marin ca	sonoma ca	napa ca	solano ca	contra costa ca	alameda ca	san mateo ca		
san joaquin ca	alameda ca	contra costa ca	sacramento ca	amador ca	calaveras ca	stanislaus ca	santa clara ca		
san luis obispo ca	monterey ca	kings ca	kern ca	ventura ca	santa barbara ca				

Table C: (continued)

County	Neighboring Counties								
san mateo ca	marin ca	san francisco ca	alameda ca	santa clara ca	santa cruz ca				
santa barbara ca	san luis obispo ca	kern ca	ventura ca						
santa clara ca	santa cruz ca	san mateo ca	alameda ca	san joaquin ca	stanislaus ca	merced ca	san benito ca		
santa cruz ca	san mateo ca	santa clara ca	san benito ca	monterey ca					
shasta ca	siskiyou ca	modoc ca	lassen ca	plumas ca	tehama ca	trinity ca			
sierra ca	lassen ca	plumas ca	yuba ca	nevada ca					
siskiyou ca	del norte ca	humboldt ca	trinity ca	shasta ca	modoc ca				
solano ca	napa ca	yolo ca	sacramento ca	contra costa ca	san francisco ca	sonoma ca			
sonoma ca	mendocino ca	lake ca	napa ca	marin ca					
stanislaus ca	san joaquin ca	calaveras ca	tuolumne ca	mariposa ca	merced ca	santa clara ca	alameda ca		
sutter ca	butte ca	yuba ca	placer ca	sacramento ca	yolo ca	colusa ca			
tehama ca	trinity ca	shasta ca	plumas ca	butte ca	glenn ca	mendocino ca			
trinity ca	siskiyou ca	shasta ca	tehama ca	mendocino ca	humboldt ca				
tulare ca	kings ca	fresno ca	inyo ca	kern ca					
tuolumne ca	alpine ca	mono ca	madera ca	mariposa ca	merced ca	stanislaus ca	calaveras ca		
ventura ca	santa barbara ca	kern ca	los angeles ca	san luis obispo ca					
yolo ca	lake ca	colusa ca	sutter ca	sacramento ca	solano ca	napa ca			
yuba ca	butte ca	plumas ca	sierra ca	nevada ca	placer ca	sutter ca			
beaverhead mt	madison mt	silver bow mt	deer lodge mt	granite mt	ravalli mt				
big horn mt	carbon mt	yellowstone mt	treasure mt	rosebud mt	powder river mt				
blaine mt	hill mt	chouteau mt	fergus mt	phillips mt					
broadwater mt	meagher mt	gallatin mt	jefferson mt	lewis and clark mt					
carbon mt	park mt	stillwater mt	yellowstone mt	big horn mt					
carter mt	powder river mt	custer mt	fallon mt						
cascade mt	chouteau mt	judith basin mt	meagher mt	lewis and clark mt	teton mt				
chouteau mt	hill mt	blaine mt	fergus mt	judith basin mt	cascade mt	teton mt	pondera mt	toole mt	liberty mt
custer mt	fallon mt	prairie mt	garfield mt	rosebud mt	powder river mt	carter mt			
daniels mt	valley mt	roosevelt mt	sheridan mt						
dawson mt	richland mt	mccone mt	prairie mt	wibaux mt					
deer lodge mt	ravalli mt	granite mt	powell mt	jefferson mt	silver bow mt	beaverhead mt			
fallon mt	wibaux mt	prairie mt	custer mt	carter mt					
fergus mt	blaine mt	phillips mt	petroleum mt	musselshell mt	golden valley mt	wheatland mt	judith basin mt	chouteau mt	
flathead mt	lincoln mt	sanders mt	lake mt	powell mt	missoula mt	lewis and clark mt	teton mt	pondera mt	glacier mt
gallatin mt	madison mt	jefferson mt	broadwater mt	meagher mt	park mt				
garfield mt	valley mt	phillips mt	petroleum mt	rosebud mt	prairie mt	mccone mt	custer mt		
glacier mt	flathead mt	pondera mt	toole mt						
golden valley mt	fergus mt	musselshell mt	yellowstone mt	stillwater mt	sweet grass mt	wheatland mt			
granite mt	missoula mt	powell mt	deer lodge mt	beaverhead mt	ravalli mt				
hill mt	liberty mt	chouteau mt	blaine mt						
jefferson mt	broadwater mt	gallatin mt	madison mt	silver bow mt	deer lodge mt	powell mt	lewis and clark mt		
judith basin mt	chouteau mt	fergus mt	wheatland mt	meagher mt	cascade mt				
lake mt	flathead mt	missoula mt	sanders mt						

Table C: (continued)

County	Neighboring Counties								
lewis and clark mt	teton mt	cascade mt	meagher mt	broadwater mt	jefferson mt	powell mt	flathead mt		
liberty mt	toole mt	pondera mt	chouteau mt	hill mt					
lincoln mt	sanders mt	flathead mt							
madison mt	beaverhead mt	silver bow mt	jefferson mt	gallatin mt					
mccone mt	garfield mt	valley mt	roosevelt mt	richland mt	dawson mt	prairie mt			
meagher mt	cascade mt	judith basin mt	wheatland mt	sweet grass mt	park mt	gallatin mt	broadwater mt	lewis and clark mt	
mineral mt	sanders mt	missoula mt							
missoula mt	mineral mt	sanders mt	lake mt	flathead mt	powell mt	granite mt	ravalli mt		
musselshell mt	fergus mt	petroleum mt	rosebud mt	treasure mt	yellowstone mt	golden valley mt			
park mt	gallatin mt	meagher mt	sweet grass mt	stillwater mt	carbon mt				
petroleum mt	garfield mt	rosebud mt	musselshell mt	fergus mt	phillips mt				
phillips mt	blaine mt	fergus mt	petroleum mt	garfield mt	valley mt				
pondera mt	glacier mt	toole mt	liberty mt	chouteau mt	teton mt	flathead mt			
powder river mt	big horn mt	rosebud mt	custer mt	carter mt					
powell mt	lewis and clark mt	jefferson mt	deer lodge mt	granite mt	missoula mt	flathead mt			
prairie mt	wibaux mt	dawson mt	mccone mt	garfield mt	rosebud mt	custer mt	fallon mt		
ravalli mt	missoula mt	granite mt	deer lodge mt	beaverhead mt					
richland mt	roosevelt mt	mccone mt	dawson mt	wibaux mt					
roosevelt mt	sheridan mt	daniels mt	valley mt	mccone mt	richland mt				
rosebud mt	garfield mt	petroleum mt	musselshell mt	treasure mt	big horn mt	powder river mt	custer mt	prairie mt	yellowstone mt
sanders mt	lincoln mt	flathead mt	lake mt	missoula mt	mineral mt				
sheridan mt	daniels mt	roosevelt mt							
silver bow mt	beaverhead mt	madison mt	jefferson mt	deer lodge mt					
stillwater mt	park mt	sweet grass mt	golden valley mt	yellowstone mt	carbon mt				
sweet grass mt	park mt	stillwater mt	golden valley mt	wheatland mt	meagher mt				
teton mt	pondera mt	chouteau mt	cascade mt	lewis and clark mt	flathead mt				
toole mt	glacier mt	pondera mt	liberty mt						
treasure mt	rosebud mt	big horn mt	yellowstone mt	musselshell mt					
valley mt	phillips mt	garfield mt	mccone mt	roosevelt mt	daniels mt				
wheatland mt	fergus mt	golden valley mt	sweet grass mt	meagher mt	judith basin mt				
wibaux mt	richland mt	dawson mt	prairie mt	fallon mt					
yellowstone mt	big horn mt	carbon mt	stillwater mt	golden valley mt	musselshell mt	rosebud mt	treasure mt		
belknap nh	carroll nh	grafton nh	merrimack nh	strafford nh					
carroll nh	coos nh	grafton nh	belknap nh	strafford nh					
cheshire nh	hillsborough nh	sullivan nh	windham vt						
coos nh	grafton nh	carroll nh	essex vt						
grafton nh	coos nh	carroll nh	belknap nh	merrimack nh	sullivan nh	essex vt	caledonia vt	orange vt	windsor vt
hillsborough nh	rockingham nh	merrimack nh	sullivan nh	cheshire nh					
merrimack nh	rockingham nh	strafford nh	belknap nh	grafton nh	sullivan nh	hillsborough nh			
rockingham nh	strafford nh	merrimack nh	hillsborough nh						
strafford nh	carroll nh	belknap nh	merrimack nh	rockingham nh					
sullivan nh	cheshire nh	hillsborough nh	merrimack nh	grafton nh	windsor vt	windham vt			
alamance nc	caswell nc	rockingham nc	guilford nc	randolph nc	chatham nc	orange nc			
alexander nc	wilkes nc	caldwell nc	catawba nc	iredell nc					
alleghany nc	ashe nc	wilkes nc	surry nc						

Table C: (continued)

County	Neighboring Counties								
anson nc	union nc	stanly nc	montgomery nc	richmond nc					
ashe nc	watauga nc	alleghany nc	wilkes nc						
avery nc	mitchell nc	mcdowell nc	burke nc	caldwell nc	watauga nc				
beaufort nc	martin nc	pitt nc	craven nc	pamlico nc	hyde nc	washington nc			
bertie nc	hertford nc	northampton nc	halifax nc	martin nc	washington nc	chowan nc	gates nc		
bladen nc	cumberland nc	robeson nc	columbus nc	pender nc	sampson nc				
brunswick nc	columbus nc	pender nc	new hanover nc						
buncombe nc	madison nc	haywood nc	transylvania nc	henderson nc	rutherford nc	mcdowell nc	yancey nc		
burke nc	avery nc	mcdowell nc	rutherford nc	cleveland nc	lincoln nc	catawba nc	caldwell nc		
cabarrus nc	rowan nc	iredell nc	mecklenburg nc	union nc	stanly nc	davidson nc			
caldwell nc	watauga nc	avery nc	burke nc	catawba nc	alexander nc	wilkes nc			
camden nc	currituck nc	gates nc	pasquotank nc						
carteret nc	onslow nc	jones nc	craven nc	pamlico nc	hyde nc				
caswell nc	rockingham nc	guilford nc	alamance nc	orange nc	person nc				
catawba nc	lincoln nc	cleveland nc	burke nc	caldwell nc	alexander nc	iredell nc			
chatham nc	randolph nc	alamance nc	orange nc	durham nc	wake nc	lee nc	harnett nc	moore nc	
cherokee nc	graham nc	macon nc	clay nc						
chowan nc	gates nc	hertford nc	bertie nc	perquimans nc					
clay nc	cherokee nc	macon nc							
cleveland nc	rutherford nc	burke nc	catawba nc	lincoln nc	gaston nc				
columbus nc	robeson nc	bladen nc	pender nc	brunswick nc					
craven nc	jones nc	lenoir nc	pitt nc	beaufort nc	pamlico nc	carteret nc			
cumberland nc	harnett nc	moore nc	hoke nc	robeson nc	bladen nc	sampson nc			
currituck nc	camden nc	dare nc							
dare nc	currituck nc	tyrrell nc	hyde nc						
davidson nc	forsyth nc	davie nc	rowan nc	montgomery nc	randolph nc	guilford nc	stanly nc		
davie nc	yadkin nc	iredell nc	rowan nc	davidson nc	forsyth nc				
duplin nc	wayne nc	sampson nc	pender nc	onslow nc	jones nc	lenoir nc			
durham nc	person nc	orange nc	chatham nc	granville nc	wake nc				
edgecombe nc	nash nc	wilson nc	pitt nc	martin nc	halifax nc				
forsyth nc	stokes nc	surry nc	yadkin nc	davie nc	davidson nc	guilford nc	rockingham nc		
franklin nc	warren nc	vance nc	granville nc	wake nc	johnston nc	nash nc	halifax nc		
gaston nc	cleveland nc	lincoln nc	mecklenburg nc						
gates nc	hertford nc	chowan nc	perquimans nc	pasquotank nc	camden nc				
graham nc	cherokee nc	macon nc	swain nc						
granville nc	person nc	durham nc	wake nc	franklin nc	vance nc				
greene nc	wilson nc	wayne nc	lenoir nc	pitt nc					
guilford nc	rockingham nc	stokes nc	forsyth nc	davidson nc	randolph nc	alamance nc	caswell nc		
halifax nc	warren nc	franklin nc	nash nc	edgecombe nc	martin nc	bertie nc	northampton nc		
harnett nc	wake nc	chatham nc	lee nc	moore nc	cumberland nc	sampson nc	johnston nc		
haywood nc	swain nc	jackson nc	transylvania nc	henderson nc	buncombe nc	madison nc			
henderson nc	transylvania nc	haywood nc	buncombe nc	rutherford nc	polk nc				
hertford nc	northampton nc	bertie nc	chowan nc	gates nc					
hoke nc	moore nc	richmond nc	scotland nc	hoke nc	cumberland nc	harnett nc			
hyde nc	carteret nc	pamlico nc	beaufort nc	washington nc	tyrrell nc	dare nc			
iredell nc	wilkes nc	alexander nc	catawba nc	lincoln nc	mecklenburg nc	cabarrus nc	rowan nc	davie nc	yadkin nc

Table C: (continued)

County	Neighboring Counties								
jackson nc	macon nc	swain nc	haywood nc	transylvania nc					
johnston nc	wake nc	harnett nc	sampson nc	wayne nc	wilson nc	nash nc	franklin nc		
jones nc	onslow nc	duplin nc	lenoir nc	craven nc	carteret nc				
lee nc	chatham nc	moore nc	harnett nc						
lenoir nc	wayne nc	duplin nc	jones nc	craven nc	pitt nc	greene nc			
lincoln nc	catawba nc	burke nc	cleveland nc	gaston nc	mecklenburg nc	iredell nc			
macon nc	clay nc	cherokee nc	graham nc	swain nc	jackson nc				
madison nc	haywood nc	buncombe nc	yancey nc						
martin nc	bertie nc	halifax nc	edgecombe nc	pitt nc	beaufort nc	washington nc			
mcdowell nc	mitchell nc	yancey nc	buncombe nc	rutherford nc	burke nc	avery nc			
mecklenburg nc	gaston nc	lincoln nc	iredell nc	cabarrus nc	union nc				
mitchell nc	yancey nc	mcdowell nc	avery nc						
montgomery nc	randolph nc	davidson nc	rowan nc	stanly nc	anson nc	richmond nc	moore nc		
moore nc	lee nc	chatham nc	randolph nc	montgomery nc	richmond nc	scotland nc	hoke nc	cumberland nc	harnett nc
nash nc	warren nc	franklin nc	wake nc	johnston nc	wilson nc	edgecombe nc	halifax nc		
new hanover nc	brunswick nc	pender nc							
northampton nc	warren nc	halifax nc	bertie nc	hertford nc					
onslow nc	pender nc	duplin nc	jones nc	carteret nc					
orange nc	person nc	caswell nc	alamance nc	chatham nc	durham nc				
pamlico nc	beaufort nc	craven nc	carteret nc	hyde nc					
pasquotank nc	gates nc	perquimans nc	camden nc						
pender nc	new hanover nc	brunswick nc	columbus nc	bladen nc	sampson nc	duplin nc	onslow nc		
perquimans nc	gates nc	chowan nc	pasquotank nc						
person nc	orange nc	durham nc	granville nc	caswell nc					
pitt nc	wilson nc	greene nc	lenoir nc	craven nc	beaufort nc	martin nc	edgecombe nc		
polk nc	henderson nc	rutherford nc							
randolph nc	montgomery nc	davidson nc	guilford nc	alamance nc	chatham nc	moore nc			
richmond nc	anson nc	stanly nc	montgomery nc	moore nc	hoke nc	scotland nc			
robeson nc	scotland nc	hoke nc	cumberland nc	bladen nc	columbus nc				
rockingham nc	stokes nc	forsyth nc	guilford nc	alamance nc	caswell nc				
rowan nc	davie nc	iredell nc	cabarrus nc	stanly nc	montgomery nc	davidson nc			
rutherford nc	polk nc	henderson nc	buncombe nc	mcdowell nc	burke nc	cleveland nc			
sampson nc	harnett nc	cumberland nc	bladen nc	pender nc	duplin nc	wayne nc	johnston nc		
scotland nc	robeson nc	hoke nc	moore nc	richmond nc					
stanly nc	rowan nc	cabarrus nc	union nc	richmond nc	montgomery nc	davidson nc			
stokes nc	surry nc	yadkin nc	forsyth nc	guilford nc	rockingham nc				
surry nc	alleghany nc	wilkes nc	yadkin nc	forsyth nc	stokes nc				
swain nc	graham nc	macon nc	jackson nc	haywood nc					
transylvania nc	jackson nc	haywood nc	buncombe nc	henderson nc					
tyrrell nc	washington nc	hyde nc	dare nc						
union nc	mecklenburg nc	cabarrus nc	stanly nc	anson nc					
vance nc	granville nc	franklin nc	warren nc						
wake nc	durham nc	chatham nc	harnett nc	johnston nc	nash nc	franklin nc	granville nc		
warren nc	vance nc	franklin nc	nash nc	halifax nc	northampton nc				
washington nc	bertie nc	martin nc	beaufort nc	hyde nc	tyrrell nc				
watauga nc	avery nc	caldwell nc	wilkes nc	ashe nc					

Table C: (continued)

County	Neighboring Counties								
wayne nc	wilson nc	johnston nc	sampson nc	duplin nc	lenoir nc	greene nc			
wilkes nc	ashe nc	watauga nc	caldwell nc	alexander nc	iredell nc	yadkin nc	surry nc	alleghany nc	
wilson nc	nash nc	johnston nc	wayne nc	greene nc	pitt nc	edgecombe nc			
yadkin nc	surry nc	wilkes nc	iredell nc	davie nc	forsyth nc	stokes nc			
yancey nc	madison nc	buncombe nc	mcdowell nc	mitchell nc					
addison vt	rutland vt	windsor vt	orange vt	washington vt	chittenden vt				
bennington vt	windham vt	windsor vt	rutland vt						
caledonia vt	grafton nh	orange vt	washington vt	lamoille vt	orleans vt	essex vt			
chittenden vt	addison vt	washington vt	lamoille vt	franklin vt	grandisle vt				
essex vt	coos nh	grafton nh	caledonia vt	orleans vt					
franklin vt	grandisle vt	chittenden vt	lamoille vt	orleans vt					
grandisle vt	chittenden vt	franklin vt							
lamoille vt	chittenden vt	franklin vt	orleans vt	caledonia vt	washington vt				
orange vt	grafton nh	windsor vt	addison vt	washington vt	caledonia vt				
orleans vt	franklin vt	lamoille vt	caledonia vt	essex vt					
rutland vt	bennington vt	windsor vt	addison vt						
washington vt	addison vt	chittenden vt	lamoille vt	caledonia vt	orange vt				
windham vt	cheshire nh	sullivan nh	bennington vt	windsor vt					
windsor vt	grafton nh	sullivan nh	windham vt	bennington vt	rutland vt	addison vt	orange vt		

APPENDIX D

WAGES AND CONTRIBUTION TO GROSS DOMESTIC PRODUCT PER WORKER: CALIFORNIA, MONTANA, NORTH CAROLINA, NEW HAMPSHIRE, AND VERMONT

Table D: Wage and Contribution to GDP per Worker (2001 prices)

		Employee Compensation per Worker				Contribution to GDP per Worker			
FIPS	County	Cnty	Next	RUS	State	Cnty	Next	RUS	State
6001	alameda ca	$37,613	$47,533	$28,644	$32,427	$68,967	$84,511	$55,074	$60,966
6003	alpine ca	$13,739	$19,340	$32,524	$32,427	$32,034	$37,538	$61,140	$60,966
6005	amador ca	$15,688	$24,015	$32,938	$32,427	$30,285	$45,000	$61,933	$60,966
6007	butte ca	$18,232	$17,072	$32,598	$32,427	$34,620	$33,538	$61,276	$60,966
6009	calaveras ca	$15,633	$22,907	$32,697	$32,427	$33,752	$42,980	$61,472	$60,966
6011	colusa ca	$18,583	$19,717	$32,622	$32,427	$44,115	$37,520	$61,320	$60,966
6013	contra costa ca	$35,443	$35,281	$31,849	$32,427	$71,036	$64,877	$60,000	$60,966
6015	del norte ca	$12,218	$16,739	$32,510	$32,427	$25,050	$32,113	$61,117	$60,966
6017	el dorado ca	$22,409	$24,827	$32,840	$32,427	$42,160	$46,082	$61,772	$60,966
6019	fresno ca	$20,548	$20,351	$33,095	$32,427	$38,149	$39,877	$62,178	$60,966
6021	glenn ca	$15,135	$17,766	$32,592	$32,427	$30,792	$34,602	$61,261	$60,966
6023	humboldt ca	$17,509	$15,599	$32,553	$32,427	$33,170	$31,287	$61,194	$60,966
6025	imperial ca	$16,031	$26,141	$33,380	$32,427	$33,946	$50,898	$62,495	$60,966
6027	inyo ca	$14,720	$21,063	$33,487	$32,427	$29,064	$39,740	$62,944	$60,966
6029	kern ca	$21,039	$30,791	$33,751	$32,427	$39,776	$59,020	$62,746	$60,966
6031	kings ca	$15,706	$20,994	$33,267	$32,427	$30,720	$40,039	$62,502	$60,966
6033	lake ca	$16,458	$25,454	$32,640	$32,427	$33,068	$48,243	$61,353	$60,966
6035	lassen ca	$11,544	$19,538	$32,510	$32,427	$22,630	$37,205	$61,118	$60,966
6037	los angeles ca	$33,527	$29,467	$32,793	$32,427	$64,227	$57,074	$60,541	$60,966
6039	madera ca	$18,721	$20,072	$32,813	$32,427	$35,000	$37,575	$61,695	$60,966
6041	marin ca	$32,597	$46,541	$31,217	$32,427	$65,403	$83,096	$59,025	$60,966
6043	mariposa ca	$16,855	$21,320	$32,647	$32,427	$30,792	$39,958	$61,382	$60,966
6045	mendocino ca	$17,446	$24,537	$32,630	$32,427	$34,622	$45,971	$61,345	$60,966
6047	merced ca	$19,736	$44,620	$31,085	$32,427	$37,500	$77,638	$59,160	$60,966
6049	modoc ca	$9,367	$18,601	$32,519	$32,427	$20,731	$35,333	$61,135	$60,966
6051	mono ca	$14,805	$20,012	$32,759	$32,427	$33,328	$37,319	$61,595	$60,966
6053	monterey ca	$24,462	$21,332	$33,185	$32,427	$49,441	$40,211	$62,342	$60,966
6055	napa ca	$27,053	$39,215	$31,964	$32,427	$53,611	$71,873	$60,215	$60,966
6057	nevada ca	$21,880	$25,861	$32,517	$32,427	$41,190	$46,588	$61,154	$60,966
6059	orange ca	$33,882	$30,458	$33,976	$32,427	$66,326	$58,544	$62,135	$60,966
6061	placer ca	$27,671	$23,635	$32,909	$32,427	$49,984	$44,214	$61,900	$60,966
6063	plumas ca	$15,203	$18,369	$32,619	$32,427	$32,199	$34,411	$61,327	$60,966
6065	riverside ca	$21,079	$31,674	$34,098	$32,427	$41,463	$61,063	$62,329	$60,966
6067	sacramento ca	$24,443	$28,025	$33,087	$32,427	$45,627	$54,050	$62,119	$60,966
6069	san benito ca	$22,159	$43,697	$31,049	$32,427	$44,545	$76,713	$59,043	$60,966
6071	san bernardino ca	$22,233	$32,081	$33,415	$32,427	$42,169	$61,846	$61,593	$60,966
6073	san diego ca	$28,117	$30,138	$33,318	$32,427	$54,584	$59,106	$62,021	$60,966
6075	san francisco ca	$49,715	$37,429	$30,837	$32,427	$90,777	$69,180	$58,289	$60,966
6077	san joaquin ca	$23,823	$40,821	$30,620	$32,427	$44,807	$73,417	$58,342	$60,966
6079	san luis obispo ca	$20,884	$24,552	$33,052	$32,427	$39,625	$47,450	$62,049	$60,966
6081	san mateo ca	$51,470	$47,605	$28,671	$32,427	$88,328	$84,799	$55,150	$60,966
6083	santa barbara ca	$24,095	$24,632	$32,901	$32,427	$46,911	$46,814	$61,812	$60,966
6085	santa clara ca	$57,908	$36,246	$29,890	$32,427	$99,273	$65,402	$57,325	$60,966
6087	santa cruz ca	$26,457	$52,312	$30,139	$32,427	$50,232	$90,579	$57,574	$60,966
6089	shasta ca	$20,819	$14,244	$32,553	$32,427	$39,034	$28,173	$61,196	$60,966
6091	sierra ca	$9,594	$18,225	$32,503	$32,427	$21,585	$34,205	$61,108	$60,966
6093	siskiyou ca	$14,317	$18,397	$32,573	$32,427	$28,835	$34,935	$61,234	$60,966
6095	solano ca	$23,408	$34,829	$32,172	$32,427	$43,759	$65,325	$60,511	$60,966

Table D: (continued)

		Employee Compensation per Worker				Contribution to GDP per Worker			
FIPS	County	Cnty	Next	RUS	State	Cnty	Next	RUS	State
6097	sonoma ca	$28,271	$27,989	$32,564	$32,427	$52,565	$55,934	$61,173	$60,966
6099	stanislaus ca	$23,186	$45,370	$30,553	$32,427	$43,083	$79,952	$58,271	$60,966
6101	sutter ca	$18,416	$23,917	$32,984	$32,427	$36,916	$44,469	$62,038	$60,966
6103	tehama ca	$17,259	$18,505	$32,635	$32,427	$31,880	$35,543	$61,347	$60,966
6105	trinity ca	$9,750	$18,336	$32,613	$32,427	$21,907	$34,972	$61,308	$60,966
6107	tulare ca	$17,694	$20,361	$33,079	$32,427	$33,505	$38,211	$62,192	$60,966
6109	tuolumne ca	$16,068	$21,169	$32,670	$32,427	$31,808	$39,873	$61,419	$60,966
6111	ventura ca	$28,797	$32,205	$32,643	$32,427	$54,921	$61,688	$60,814	$60,966
6113	yolo ca	$22,647	$24,045	$32,964	$32,427	$41,945	$45,370	$61,970	$60,966
6115	yuba ca	$15,936	$22,748	$32,631	$32,427	$27,718	$42,357	$61,360	$60,966
30001	beaverhead mt	$13,590	$16,859	$16,645	$16,633	$51,435	$34,534	$33,404	$33,669
30003	big horn mt	$10,610	$20,577	$15,801	$16,633	$22,307	$42,999	$31,664	$33,669
30005	blaine mt	$7,484	$11,921	$16,878	$16,633	$18,977	$25,690	$34,080	$33,669
30007	broadwater mt	$13,392	$16,180	$16,742	$16,633	$28,805	$31,415	$34,164	$33,669
30009	carbon mt	$10,673	$20,608	$15,692	$16,633	$25,139	$42,289	$31,583	$33,669
30011	carter mt	$5,655	$13,304	$16,705	$16,633	$21,094	$27,804	$33,787	$33,669
30013	cascade mt	$16,405	$15,083	$16,816	$16,633	$30,606	$29,768	$34,402	$33,669
30015	chouteau mt	$8,754	$14,731	$17,015	$16,633	$23,894	$28,944	$34,551	$33,669
30017	custer mt	$14,141	$13,370	$16,726	$16,633	$27,970	$36,787	$33,678	$33,669
30019	daniels mt	$9,738	$10,317	$16,790	$16,633	$26,473	$23,987	$33,900	$33,669
30021	dawson mt	$13,325	$13,226	$16,716	$16,633	$28,628	$28,549	$33,795	$33,669
30023	deer lodge mt	$12,768	$16,446	$16,682	$16,633	$24,455	$36,319	$33,478	$33,669
30025	fallon mt	$13,960	$12,349	$16,708	$16,633	$32,627	$26,438	$33,784	$33,669
30027	fergus mt	$13,130	$8,704	$16,874	$16,633	$26,530	$22,008	$34,050	$33,669
30029	flathead mt	$17,462	$16,504	$16,575	$16,633	$34,313	$31,759	$34,383	$33,669
30031	gallatin mt	$16,472	$13,727	$16,769	$16,633	$32,257	$30,119	$33,967	$33,669
30033	garfield mt	$7,416	$13,787	$16,756	$16,633	$22,616	$32,882	$33,715	$33,669
30035	glacier mt	$10,681	$16,958	$16,667	$16,633	$26,279	$33,639	$33,760	$33,669
30037	golden valley mt	$6,514	$20,667	$15,657	$16,633	$17,872	$42,385	$31,557	$33,669
30039	granite mt	$9,765	$17,581	$16,450	$16,633	$23,820	$34,601	$33,501	$33,669
30041	hill mt	$12,530	$8,865	$16,808	$16,633	$25,992	$22,564	$33,950	$33,669
30043	jefferson mt	$13,127	$16,518	$16,701	$16,633	$29,601	$32,659	$33,998	$33,669
30045	judith basin mt	$5,804	$15,443	$16,808	$16,633	$17,772	$29,657	$34,215	$33,669
30047	lake mt	$12,606	$17,998	$16,352	$16,633	$25,494	$34,552	$33,651	$33,669
30049	lewis and clark mt	$16,290	$16,347	$16,744	$16,633	$30,635	$31,899	$34,447	$33,669
30051	liberty mt	$12,300	$12,097	$16,802	$16,633	$27,233	$26,515	$33,936	$33,669
30053	lincoln mt	$16,072	$16,924	$16,612	$16,633	$29,381	$33,447	$33,774	$33,669
30055	madison mt	$13,042	$16,879	$16,619	$16,633	$30,718	$35,662	$33,352	$33,669
30057	mccone mt	$10,152	$12,141	$16,831	$16,633	$28,162	$26,422	$33,979	$33,669
30059	meagher mt	$10,665	$16,108	$16,853	$16,633	$26,615	$30,969	$34,739	$33,669
30061	mineral mt	$10,807	$18,346	$16,390	$16,633	$20,883	$34,716	$33,558	$33,669
30063	missoula mt	$18,821	$15,705	$16,458	$16,633	$35,401	$30,998	$33,969	$33,669
30065	musselshell mt	$9,929	$20,553	$15,741	$16,633	$21,567	$42,755	$31,588	$33,669
30067	park mt	$14,834	$16,550	$16,675	$16,633	$30,920	$33,064	$33,799	$33,669
30069	petroleum mt	$3,863	$13,366	$16,746	$16,633	$15,601	$32,007	$33,732	$33,669
30071	phillips mt	$10,450	$11,819	$16,798	$16,633	$24,598	$25,921	$33,931	$33,669
30073	pondera mt	$12,904	$15,842	$16,763	$16,633	$27,209	$32,541	$33,863	$33,669
30075	powder river mt	$6,923	$13,537	$16,758	$16,633	$18,433	$31,649	$33,768	$33,669

Table D: (continued)

		Employee Compensation per Worker				Contribution to GDP per Worker			
FIPS	County	Cnty	Next	RUS	State	Cnty	Next	RUS	State
30077	powell mt	$11,548	$17,458	$16,321	$16,633	$24,164	$33,445	$33,846	$33,669
30079	prairie mt	$7,216	$13,999	$16,749	$16,633	$22,414	$33,113	$33,704	$33,669
30081	ravalli mt	$16,074	$17,988	$16,415	$16,633	$30,509	$35,675	$33,434	$33,669
30083	richland mt	$15,100	$10,148	$16,794	$16,633	$30,019	$23,408	$33,938	$33,669
30085	roosevelt mt	$7,542	$13,073	$16,824	$16,633	$17,691	$29,080	$33,957	$33,669
30087	rosebud mt	$16,987	$19,887	$15,828	$16,633	$47,435	$40,875	$31,728	$33,669
30089	sanders mt	$11,729	$17,524	$16,384	$16,633	$25,256	$33,563	$33,808	$33,669
30091	sheridan mt	$10,406	$8,055	$16,767	$16,633	$25,937	$19,741	$33,876	$33,669
30093	silver bow mt	$19,899	$13,168	$16,634	$16,633	$42,219	$35,350	$33,310	$33,669
30095	stillwater mt	$25,292	$20,265	$15,651	$16,633	$52,151	$41,705	$31,504	$33,669
30097	sweet grass mt	$12,168	$17,585	$16,622	$16,633	$25,285	$37,113	$33,598	$33,669
30099	teton mt	$11,771	$16,476	$16,725	$16,633	$30,714	$31,625	$34,407	$33,669
30101	toole mt	$13,470	$11,574	$16,748	$16,633	$30,006	$26,677	$33,824	$33,669
30103	treasure mt	$9,506	$20,463	$15,751	$16,633	$21,601	$42,612	$31,606	$33,669
30105	valley mt	$13,739	$8,781	$16,820	$16,633	$30,784	$21,912	$33,938	$33,669
30107	wheatland mt	$10,570	$11,847	$16,747	$16,633	$26,516	$25,231	$33,865	$33,669
30109	wibaux mt	$5,654	$13,921	$16,711	$16,633	$19,776	$29,493	$33,787	$33,669
30111	yellowstone mt	$21,490	$15,283	$15,696	$16,633	$44,007	$35,254	$31,435	$33,669
33001	belknap nh	$22,618	$25,251	$27,691	$27,039	$41,579	$43,866	$49,490	$48,107
33003	carroll nh	$19,644	$24,830	$27,652	$27,039	$38,482	$43,374	$49,242	$48,107
33005	cheshire nh	$24,086	$32,363	$25,299	$27,039	$41,767	$55,994	$45,631	$48,107
33007	coos nh	$20,847	$24,582	$27,359	$27,039	$40,669	$42,684	$48,708	$48,107
33009	grafton nh	$26,996	$22,333	$28,450	$27,039	$44,869	$40,684	$50,566	$48,107
33011	hillsborough nh	$34,445	$28,799	$23,089	$27,039	$58,859	$51,041	$42,167	$48,107
33013	merrimack nh	$25,873	$30,946	$22,468	$27,039	$44,983	$53,844	$41,649	$48,107
33015	rockingham nh	$32,125	$31,125	$22,950	$27,039	$57,415	$53,486	$41,969	$48,107
33017	strafford nh	$25,112	$28,321	$26,647	$27,039	$43,763	$50,696	$47,347	$48,107
33019	sullivan nh	$22,584	$29,481	$25,284	$27,039	$41,630	$50,831	$46,196	$48,107
37001	alamance nc	$24,969	$25,860	$25,352	$25,402	$42,914	$47,263	$46,994	$46,957
37003	alexander nc	$18,967	$25,052	$25,443	$25,402	$30,745	$41,955	$47,291	$46,957
37005	alleghany nc	$16,275	$20,843	$25,501	$25,402	$33,505	$37,320	$47,158	$46,957
37007	anson nc	$16,945	$22,437	$25,497	$25,402	$36,664	$39,990	$47,158	$46,957
37009	ashe nc	$16,219	$20,317	$25,499	$25,402	$36,040	$36,729	$47,131	$46,957
37011	avery nc	$14,903	$20,506	$25,575	$25,402	$30,031	$36,273	$47,318	$46,957
37013	beaufort nc	$19,132	$18,851	$25,662	$25,402	$33,390	$33,067	$47,509	$46,957
37015	bertie nc	$16,286	$17,374	$25,532	$25,402	$33,394	$34,207	$47,161	$46,957
37017	bladen nc	$17,363	$16,067	$26,038	$25,402	$30,023	$30,707	$48,075	$46,957
37019	brunswick nc	$19,752	$21,878	$25,557	$25,402	$48,305	$41,442	$47,125	$46,957
37021	buncombe nc	$22,741	$21,048	$25,622	$25,402	$38,688	$39,652	$47,438	$46,957
37023	burke nc	$21,870	$23,771	$25,538	$25,402	$37,476	$40,064	$47,478	$46,957
37025	cabarrus nc	$23,495	$33,553	$23,556	$25,402	$74,868	$58,926	$43,641	$46,957
37027	caldwell nc	$21,710	$23,564	$25,534	$25,402	$36,398	$40,057	$47,421	$46,957
37029	camden nc	$13,387	$13,287	$25,479	$25,402	$33,215	$28,837	$47,069	$46,957
37031	carteret nc	$14,727	$12,641	$25,916	$25,402	$29,575	$22,767	$47,912	$46,957
37033	caswell nc	$11,136	$26,375	$25,299	$25,402	$25,074	$47,752	$46,886	$46,957
37035	catawba nc	$27,340	$22,287	$25,518	$25,402	$45,014	$37,500	$47,503	$46,957
37037	chatham nc	$19,818	$29,157	$24,458	$25,402	$37,260	$50,226	$46,167	$46,957
37039	cherokee nc	$17,120	$16,095	$25,467	$25,402	$31,115	$30,536	$47,074	$46,957

Table D: (continued)

		Employee Compensation per Worker				Contribution to GDP per Worker			
FIPS	County	Cnty	Next	RUS	State	Cnty	Next	RUS	State
37041	chowan nc	$19,076	$15,746	$25,464	$25,402	$37,188	$31,251	$47,057	$46,957
37043	clay nc	$13,448	$16,922	$25,459	$25,402	$29,882	$31,191	$47,060	$46,957
37045	cleveland nc	$22,410	$25,230	$25,443	$25,402	$36,863	$42,038	$47,387	$46,957
37047	columbus nc	$19,685	$18,127	$25,606	$25,402	$43,009	$37,021	$47,216	$46,957
37049	craven nc	$19,056	$18,112	$25,764	$25,402	$31,364	$33,261	$47,684	$46,957
37051	cumberland nc	$15,021	$18,171	$26,111	$25,402	$27,467	$34,539	$48,242	$46,957
37053	currituck nc	$14,284	$16,051	$25,471	$25,402	$35,569	$35,552	$47,038	$46,957
37055	dare nc	$16,304	$12,512	$25,479	$25,402	$35,776	$32,552	$47,049	$46,957
37057	davidson nc	$19,632	$29,074	$24,859	$25,402	$35,267	$59,843	$44,903	$46,957
37059	davie nc	$18,867	$27,505	$25,223	$25,402	$35,467	$61,529	$45,599	$46,957
37061	duplin nc	$15,836	$13,643	$26,045	$25,402	$30,127	$25,844	$48,108	$46,957
37063	durham nc	$40,487	$26,976	$24,405	$25,402	$61,391	$49,060	$45,912	$46,957
37065	edgecombe nc	$20,829	$21,874	$25,591	$25,402	$40,326	$40,439	$47,294	$46,957
37067	forsyth nc	$31,537	$26,107	$24,989	$25,402	$82,425	$47,392	$45,037	$46,957
37069	franklin nc	$16,192	$27,604	$25,101	$25,402	$32,897	$50,926	$46,403	$46,957
37071	gaston nc	$26,249	$36,425	$23,531	$25,402	$43,612	$64,170	$44,143	$46,957
37073	gates nc	$10,732	$15,284	$25,502	$25,402	$30,352	$29,853	$47,121	$46,957
37075	graham nc	$15,319	$16,134	$25,477	$25,402	$27,866	$29,447	$47,097	$46,957
37077	granville nc	$17,077	$32,036	$24,267	$25,402	$37,778	$54,523	$45,660	$46,957
37079	greene nc	$11,278	$19,703	$25,701	$25,402	$25,279	$34,809	$47,578	$46,957
37081	guilford nc	$30,129	$26,095	$24,934	$25,402	$54,431	$58,463	$44,960	$46,957
37083	halifax nc	$17,270	$21,083	$25,559	$25,402	$34,942	$42,127	$47,147	$46,957
37085	harnett nc	$16,450	$24,877	$25,591	$25,402	$32,139	$45,513	$47,389	$46,957
37087	haywood nc	$19,767	$21,453	$25,627	$25,402	$39,562	$37,972	$47,440	$46,957
37089	henderson nc	$22,096	$22,187	$25,582	$25,402	$41,310	$38,910	$47,382	$46,957
37091	hertford nc	$17,621	$16,247	$25,469	$25,402	$30,415	$36,304	$47,052	$46,957
37093	hoke nc	$13,248	$17,382	$25,960	$25,402	$25,450	$31,862	$48,004	$46,957
37095	hyde nc	$10,009	$15,953	$25,592	$25,402	$26,252	$32,051	$47,254	$46,957
37097	iredell nc	$23,848	$33,305	$23,447	$25,402	$40,486	$60,825	$43,594	$46,957
37099	jackson nc	$15,069	$19,078	$25,525	$25,402	$27,616	$37,297	$47,159	$46,957
37101	johnston nc	$22,071	$26,716	$25,215	$25,402	$45,686	$48,716	$46,669	$46,957
37103	jones nc	$13,154	$14,149	$26,010	$25,402	$33,042	$25,700	$48,099	$46,957
37105	lee nc	$24,283	$19,557	$25,535	$25,402	$42,859	$37,139	$47,196	$46,957
37107	lenoir nc	$18,545	$17,951	$25,844	$25,402	$33,114	$31,844	$47,852	$46,957
37109	lincoln nc	$21,319	$33,226	$23,433	$25,402	$36,400	$57,781	$44,262	$46,957
37111	macon nc	$16,776	$15,187	$25,525	$25,402	$31,295	$27,884	$47,186	$46,957
37113	madison nc	$14,429	$21,984	$25,542	$25,402	$28,253	$38,513	$47,289	$46,957
37115	martin nc	$21,316	$18,967	$25,645	$25,402	$34,908	$35,325	$47,407	$46,957
37117	mcdowell nc	$21,809	$21,686	$25,609	$25,402	$41,912	$37,347	$47,472	$46,957
37119	mecklenburg nc	$37,994	$24,453	$23,494	$25,402	$67,165	$49,669	$43,542	$46,957
37121	mitchell nc	$16,984	$18,481	$25,471	$25,402	$31,092	$36,402	$47,067	$46,957
37123	montgomery nc	$18,996	$22,477	$25,602	$25,402	$34,631	$40,103	$47,416	$46,957
37125	moore nc	$22,121	$17,997	$26,109	$25,402	$41,479	$32,759	$48,305	$46,957
37127	nash nc	$25,511	$27,589	$25,063	$25,402	$51,334	$50,396	$46,373	$46,957
37129	new hanover nc	$23,227	$18,243	$25,526	$25,402	$42,324	$43,420	$47,104	$46,957
37131	northampton nc	$15,051	$16,650	$25,505	$25,402	$41,582	$32,895	$47,107	$46,957
37133	onslow nc	$8,603	$15,001	$25,899	$25,402	$16,563	$30,138	$47,823	$46,957
37135	orange nc	$15,166	$33,693	$24,964	$25,402	$28,420	$53,303	$46,801	$46,957

Table D: (continued)

		Employee Compensation per Worker				Contribution to GDP per Worker			
FIPS	County	Cnty	Next	RUS	State	Cnty	Next	RUS	State
37137	pamlico nc	$12,683	$17,658	$25,605	$25,402	$28,525	$31,143	$47,364	$46,957
37139	pasquotank nc	$13,275	$11,767	$25,473	$25,402	$26,328	$30,754	$47,065	$46,957
37141	pender nc	$14,357	$17,174	$26,041	$25,402	$30,840	$33,804	$47,973	$46,957
37143	perquimans nc	$11,357	$14,550	$25,477	$25,402	$29,263	$29,462	$47,074	$46,957
37145	person nc	$19,825	$31,968	$24,976	$25,402	$36,717	$50,851	$46,726	$46,957
37147	pitt nc	$19,451	$20,234	$25,747	$25,402	$35,029	$35,403	$47,703	$46,957
37149	polk nc	$18,176	$22,071	$25,464	$25,402	$32,119	$39,554	$47,093	$46,957
37151	randolph nc	$22,634	$26,742	$25,265	$25,402	$41,109	$48,154	$46,884	$46,957
37153	richmond nc	$19,615	$20,190	$25,561	$25,402	$37,503	$36,467	$47,267	$46,957
37155	robeson nc	$18,290	$16,064	$26,005	$25,402	$33,447	$29,446	$48,090	$46,957
37157	rockingham nc	$21,787	$29,472	$24,810	$25,402	$42,915	$61,602	$44,738	$46,957
37159	rowan nc	$29,344	$21,862	$25,569	$25,402	$47,538	$47,919	$46,893	$46,957
37161	rutherford nc	$22,035	$22,295	$25,627	$25,402	$37,033	$38,662	$47,562	$46,957
37163	sampson nc	$16,722	$16,504	$26,224	$25,402	$37,043	$30,979	$48,401	$46,957
37165	scotland nc	$21,565	$19,333	$25,574	$25,402	$32,641	$36,080	$47,296	$46,957
37167	stanly nc	$21,027	$23,386	$25,558	$25,402	$37,268	$49,459	$46,849	$46,957
37169	stokes nc	$14,245	$29,052	$24,877	$25,402	$28,172	$61,139	$44,837	$46,957
37171	surry nc	$19,662	$28,751	$25,248	$25,402	$34,319	$71,252	$45,555	$46,957
37173	swain nc	$12,776	$17,336	$25,526	$25,402	$22,083	$33,188	$47,173	$46,957
37175	transylvania nc	$23,298	$21,638	$25,591	$25,402	$47,014	$38,350	$47,372	$46,957
37177	tyrrell nc	$9,939	$15,049	$25,478	$25,402	$32,473	$33,402	$47,055	$46,957
37179	union nc	$24,748	$35,581	$23,584	$25,402	$43,170	$66,464	$43,511	$46,957
37181	vance nc	$19,859	$16,220	$25,517	$25,402	$33,583	$34,897	$47,135	$46,957
37183	wake nc	$29,941	$30,563	$24,337	$25,402	$53,904	$51,514	$45,665	$46,957
37185	warren nc	$12,649	$20,911	$25,529	$25,402	$29,055	$41,597	$47,111	$46,957
37187	washington nc	$11,823	$18,271	$25,488	$25,402	$25,841	$33,229	$47,116	$46,957
37189	watauga nc	$16,566	$21,023	$25,547	$25,402	$31,484	$37,405	$47,249	$46,957
37191	wayne nc	$17,028	$19,964	$25,737	$25,402	$29,916	$38,273	$47,540	$46,957
37193	wilkes nc	$24,066	$20,421	$25,663	$25,402	$41,724	$35,767	$47,560	$46,957
37195	wilson nc	$24,678	$20,359	$25,717	$25,402	$42,415	$38,931	$47,492	$46,957
37197	yadkin nc	$16,790	$27,107	$25,280	$25,402	$30,492	$62,320	$45,653	$46,957
37199	yancey nc	$14,495	$22,019	$25,542	$25,402	$30,984	$38,274	$47,298	$46,957
50001	addison vt	$20,707	$24,260	$27,960	$27,039	$35,176	$44,877	$49,310	$48,104
50003	bennington vt	$21,021	$21,668	$27,712	$27,039	$38,259	$40,238	$49,114	$48,104
50005	caledonia vt	$17,737	$22,211	$27,906	$27,039	$33,918	$38,619	$49,740	$48,104
50007	chittenden vt	$28,293	$19,454	$27,692	$27,039	$53,005	$35,529	$48,821	$48,104
50009	essex vt	$18,704	$23,400	$27,441	$27,039	$34,962	$40,944	$48,889	$48,104
50011	franklin vt	$18,022	$26,140	$27,374	$27,039	$36,409	$49,053	$48,215	$48,104
50013	grandisle vt	$12,579	$26,743	$27,109	$27,039	$28,998	$50,500	$47,805	$48,104
50015	lamoille vt	$18,002	$24,200	$27,828	$27,039	$33,943	$45,255	$48,971	$48,104
50017	orange vt	$15,667	$22,598	$27,992	$27,039	$29,680	$39,211	$49,953	$48,104
50019	orleans vt	$17,283	$17,960	$27,614	$27,039	$32,261	$34,960	$48,958	$48,104
50021	rutland vt	$21,537	$20,845	$27,704	$27,039	$39,650	$37,255	$49,226	$48,104
50023	washington vt	$20,350	$24,826	$27,782	$27,039	$36,102	$46,185	$49,026	$48,104
50025	windham vt	$22,695	$22,313	$27,736	$27,039	$43,306	$39,952	$49,222	$48,104
50027	windsor vt	$20,803	$22,910	$28,210	$27,039	$37,906	$40,667	$50,176	$48,104

APPENDIX E

ADDITIONAL EMPIRICAL CONSIDERATIONS

ADDITIONAL EMPIRICAL CONSIDERATIONS

Beyond the theory of a SAM impact analysis or the mechanical aspects of running the SEBAS software, a person performing a socio-economic impact analysis of a RBS loan or grant is frequently faced with a myriad of technical issues that have to be solved or addressed.

ADJUSTING FOR INFLATION

The purpose of most impact analyses is to estimate the likely economic and social consequences of projects or actions. In most economic impact models, this estimation is done with a series of equations whose parametric values are computed with reference to a base year (e.g., 2001 or some other convenient year). As a result, the technical relationships only reflect the existing economic conditions for that base year. Among the changes that occur over time is the rate of inflation. Normally, inflation is handled in economic models by deflating current monetary values of model inputs in terms of a model's reference year and then model's output values are inflated to the desired impact year.

In its simplest form, a monetary value is the product of price and quantity. Therefore, the task of price deflation is to separate the prices from the quantities within the monetary values. The importance of consistency in time/price/quantity relationships becomes apparent in the context of economic models. Consequently, it is very important that the input information provided by a model's user be as consistent with the technical relationships of the model as possible.

Inflation has two effects on measuring monetary evaluations of quantities that are important for properly using economic impact models. First, inflation reduces the overall purchasing power of expenditures. Second, inflation alters the mix of commodities purchased by the expenditures. That is, although

inflation generally affects the prices for all goods and services, some commodities are more affected than others. Thus, the relationship between the prices of commodity changes due to the differential effects of inflation (or as economists like to say, “the relative prices of goods and services change”). As this occurs, consumers and producers purchase more of some things and less of others, especially when some “substitutability” exists among commodities. This happens because consumers and producers attempt to reduce the deleterious effects of inflation has on their general welfare or profit situation.

A price index is a number that indicates a relative change in the price of a commodity over time or that shows the relative change in an average of the prices of several goods over time. Price indexes are compiled with reference to a base year (e.g., 1987) and computed in relation to a standard value (e.g., 19878=100). A price index can be restated for another base year by dividing its current value be the price index value for the desired base year. The resultant price index can be stated in terms of a standard value (e.g., new base year = 100) by multiplying it by the standard value.

Arithmetically, deflating monetary values is simple: just multiply the monetary value by the ratio of the standard value to the appropriate price index. If the standard value is equal to one, then deflating a monetary value is computed by dividing the monetary value by the price index. This does not mean that actual physical quantities have been determined (e.g., bushels of wheat). Instead, the monetary values have been made consistent with the prices that existed during the reference period. That is, the effects of price changes since the base period have been removed, revealing the changes in the physical quantities since the base year (expressed in terms of the prices for the base period).

There are two types of price indexes: commodity price indexes and composite price indexes. A commodity price index is a price index for a specific

good or service (such as cotton) or for a narrowly defined group of commodities (e.g., household appliances). Deflating the changes in expenditures due to a project or action by type of product or by industrial sector permits an analyst to accurately estimate the relevant changes in expenditures, because the differential effects of inflation on the relative prices of goods and services are taken into account. Detailed commodity price indexes are published monthly in terms of prices paid by producers and consumers. An analyst should check with the U.S. Bureau of Labor Statistics (BLS) for copies of the reports, *Producer Prices and Price Indexes* and *CPI Detailed Report*. In addition, detailed industrial price indexes are available on an annual basis from BLS through their publication, *Time Series Data on Output, Prices, and Employment*. These reports contain the latest available commodity price indexes.

Whereas a commodity price index reflects the relative price change for a specific commodity, a composite price index is the average relative change in prices for a broad range of commodities over time. Composite price indexes have been compiled for many groups of commodities (e.g., consumer expenditures, construction costs, government purchases, and investment expenditures). A good source for many of the published composite price indexes is BLS (again) and a current issue of the *Survey of Current Business*, published by the U.S. Bureau of Economic Analysis (BEA).

Because composite price indexes are weighted averages of relative price changes for groups of specific commodities, their proper use depends on whether the quantity weights used in their calculation are relevant to the situation to which they are being applied. They can be useful when applied appropriately, especially to deflate expenditures for which the pattern of commodities purchased is not known; however, they can present problems of impact analysis when they are used improperly. For example, probably the most widely used composite price index for measuring the overall rate of inflation is the Consumer

Price Index (CPI) from BLS.[3] But there seems to be little understanding of or little attention paid to the procedures used to compile the CPI. Specifically, the CPI is computed using commodity prices paid by urban residents and weighted by a specific expenditure pattern. Thus, it seems inappropriate to deflate the consumer expenditures by residents of a rural area using a CPI, because the expenditure pattern for urban residents is not likely to be the same as for rural residents.

An analyst should also be aware of the time period that the quantity weights for the composite commodities are chosen. Composite price indexes that are computed using a fixed set of quantity weights are called "fixed-weighted" price indexes. Because the quantity weights are held constant over time, the changes observed in the price index result from price changes. Composite price indexes computed by permitting the quantity weights to vary from one period to the next are called "implicit" price indexes. Both the weights and prices fluctuate, which makes comparing price indexes for two different years difficult. The selection of the most appropriate composite price index will depend on its use. An implicit price index is good for determining the current rate of inflation, because the most recent set of quantity weights is used; thus, price changes implied by an implicit price index reflect the average relative price change for the actual set of goods and services most recently purchased. On the other hand, for computing relative price changes over a period of time (e.g., for deflating expenditures), fixed-weighted price indexes would seem most appropriate when they are available. Table E.1 provides several types of composite price indexes that a acceptable for use in economic impact analysis.

[3] Evidence for this statement is that the CPI is used to determine the change in benefits paid to recipients of programs such as Social Security, Federal Retirement, and many state retirement programs, and even some wage contracts negotiated by unions.

Table E.1: Examples of Composite Price Indexes

		1997	1998	1999	2000	2001	2002	2003
		Bureau of Labor Statistics [Index numbers, 1982-1984=100]						
Consumer Price Index, All Urban Consumers - (CPI-U)		160.50	163.00	166.60	172.20	177.10	179.90	184.00
Producer Price Indexes	Finished goods	131.8	130.7	133	138	140.7	138.9	143.3
	Capital equipment	138.2	137.6	137.6	138.8	139.7	139.1	139.5
	Finished goods less food and energy	142.4	143.7	146.1	148	150	150.2	150.5
	Finished energy goods	83.4	75.1	78.8	94.1	96.7	88.8	102
	Intermediate materials, supplies & components	125.6	123	123.2	129.2	129.7	127.8	133.7
	Materials & components for construction	146.5	146.8	148.9	150.7	150.6	151.3	153.6
	Crude materials	111.1	96.8	98.2	120.6	121	108.1	135.3
	All commodities	127.6	124.4	125.5	132.7	134.2	131.1	138.1
	Industrial commodities	127.7	124.8	126.5	134.8	135.7	132.4	139.1
		Bureau of Economic Analysis [Index numbers, 2000=100]						
Gross domestic product		96.8	97.0	98.0	100.0	102.4	104.1	106.1
Personal consumption expenditures		96.4	96.5	97.7	100.0	102.1	103.6	105.7
Gross domestic purchases		96.9	96.6	97.7	100.0	102.0	103.5	105.7
Gross national product		96.8	97.0	98.0	100.0	102.4	104.1	106.1
Manufacturing and trade industries		99.37	97.10	97.25	100.00	99.43	98.46	100.07
Manufacturing industries		98.63	96.82	97.04	100.00	100.02	99.11	101.46
Durable goods manufacturing industries		102.34	100.85	99.98	100.00	99.46	98.85	98.61
Nondurable goods manufacturing industries		93.87	91.69	93.27	100.00	100.72	99.45	104.97
Merchant wholesale industries		102.25	97.56	96.70	100.00	98.59	97.85	100.90
Durable goods merchant wholesale industries		108.84	103.88	100.58	100.00	97.09	95.77	95.84
Nondurable goods merchant wholesale industries		95.34	90.93	92.57	100.00	100.17	100.03	106.04
Retail trade industries		99.32	97.85	98.25	100.00	99.77	98.31	97.85

SPATIALLY DISTRIBUTING FIRM EXPENDITURES

Using a multiregional model, such as the RBS SEBAS, provides a great degree of flexibility in carrying out almost any type of regional economic impact analysis and the information content of the of the results allows much to said about an activity and its influence on local areas, as well as, broader geographic spaces. It combines the industry-specific nature of the firm causing an impact with the added spatial dimension to produce impact estimates for the industrial sectors that are affected by a project and their locations. But all this analytical capacity does not come without a “price”. As usual, a user of SEBAS must interpret a firm’s activities and derive a set of geographically specific expense expenditures reflecting those interpretations.

This means that a firm’s expenses must not only be specified by commodity but also according to where the purchases are made. For example,

we must specify both the quantity of leather goods purchased (in monetary terms) and the amounts purchased from producers in the county where the firm is located, in the adjacent counties, in the remainder of the state, and from places elsewhere. If the loan or grant recipient knows and provides this data then it is appropriate to use this information. On the other hand, it is common for a firm to have a reasonably good idea of the commodity distribution of its expenses, but not where the goods and services come from (especially since the billing address may not be the actual location where the purchased goods and services are produced).

There has been some concern expressed in the past over the accuracy of regionally distributing expenditures, especially in the industrial detail required by multi-regional models like SEBAS. Probably the most desirable method of determining the regional distribution is to perform a survey. This ensures the quality of the estimates, as long as the survey is conducted properly. However, surveying is not only time consuming but also expensive. Under conditions of limited timeframes and tight budgets (which is characteristic of most impact analyses) surveying is normally out of the question.

Several alternative options to surveying for distributing expenditures have been developed by regional analysts, for example, shares and gravity indexes. and multi-regional trade coefficients. However, the sector-specific multi-regional trade coefficients in SEBAS provide ideal measures for distributing business expenses (Miller and Blair, 1985, pp. 69-85). Suppose one has a vector of industry-specific expenditures, say $\boldsymbol{E^R}$, that defines spending that originates in region ***R*** but not where they occur. For example, a firm in a Montana county might require $2,000,000 worth of office supplies but not know where they are purchased from or produced. To distribute the firm's expenditures to other region ***S***, one pre-multiplies $\boldsymbol{E^R}$ by the matrix of regional trade coefficients, $\boldsymbol{T^{SR}}$, that indicate the proportion of goods and services purchased from region ***S*** by businesses and residents of region ***R***.

Table E.2: Business Expenses of a Hypothetical Firm

			Expenses at Origin
County	Agriculture	1	$1,000
	Mining & Construction	2	$300
	Manufacturing	3	$10,000
	Trade & Transportation	4	$20,000
	Services	5	$5,000
Adjacent Counties	Agriculture	1	$0
	Mining & Construction	2	$0
	Manufacturing	3	$0
	Trade & Transportation	4	$0
	Services	5	$0
Rest of State	Agriculture	1	$0
	Mining & Construction	2	$0
	Manufacturing	3	$0
	Trade & Transportation	4	$0
	Services	5	$0
Rest of World			$0
Total			$36,300

Suppose that a firm located in the “county” region requires the purchase of $36.3 million worth of goods and services (Table E.2). The spending represents a firm’s purchases of its requirements in order to carry on its business. Next, suppose we have a multi-region trade coefficients matrix containing a 5-sector (agriculture, mining and construction, manufacturing, trade and transportation, and services), 3-region (county, adjacent counties, and rest of state) set of regional trade coefficients (Table E.3). The geographically distributed business expenses are calculated by pre-multiplying the business expense table by the multi-region trade coefficients table ($\boldsymbol{T^{SR} \times E^{R}}$ in matrix notation); see Table E.4.

Table E.3: Multi-Regional Trade Coefficients for Hypothetical Regions

Producing Region/Industry			County					Adjacent Counties					Rest of State				
			1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
County	Agriculture	1	0.427	0.000	0.000	0.000	0.000	0.037	0.000	0.000	0.000	0.000	0.015	0.000	0.000	0.000	0.000
	Mining & Construction	2	0.000	0.347	0.000	0.000	0.000	0.000	0.039	0.000	0.000	0.000	0.000	0.015	0.000	0.000	0.000
	Manufacturing	3	0.000	0.000	0.405	0.000	0.000	0.000	0.000	0.091	0.000	0.000	0.000	0.000	0.076	0.000	0.000
	Trade & Transportation	4	0.000	0.000	0.000	0.483	0.000	0.000	0.000	0.000	0.095	0.000	0.000	0.000	0.000	0.053	0.000
	Services	5	0.000	0.000	0.000	0.000	0.375	0.000	0.000	0.000	0.000	0.100	0.000	0.000	0.000	0.000	0.100
Adjacent Counties	Agriculture	1	0.237	0.000	0.000	0.000	0.000	0.582	0.000	0.000	0.000	0.000	0.160	0.000	0.000	0.000	0.000
	Mining & Construction	2	0.000	0.222	0.000	0.000	0.000	0.000	0.524	0.000	0.000	0.000	0.000	0.172	0.000	0.000	0.000
	Manufacturing	3	0.000	0.000	0.131	0.000	0.000	0.000	0.000	0.468	0.000	0.000	0.000	0.000	0.129	0.000	0.000
	Trade & Transportation	4	0.000	0.000	0.000	0.108	0.000	0.000	0.000	0.000	0.555	0.000	0.000	0.000	0.000	0.088	0.000
	Services	5	0.000	0.000	0.000	0.000	0.134	0.000	0.000	0.000	0.000	0.480	0.000	0.000	0.000	0.000	0.162
Rest of State	Agriculture	1	0.023	0.000	0.000	0.000	0.000	0.054	0.000	0.000	0.000	0.000	0.634	0.000	0.000	0.000	0.000
	Mining & Construction	2	0.000	0.023	0.000	0.000	0.000	0.000	0.053	0.000	0.000	0.000	0.000	0.480	0.000	0.000	0.000
	Manufacturing	3	0.000	0.000	0.013	0.000	0.000	0.000	0.000	0.023	0.000	0.000	0.000	0.000	0.522	0.000	0.000
	Trade & Transportation	4	0.000	0.000	0.000	0.153	0.000	0.000	0.000	0.000	0.022	0.000	0.000	0.000	0.000	0.633	0.000
	Services	5	0.000	0.000	0.000	0.000	0.011	0.000	0.000	0.000	0.000	0.025	0.000	0.000	0.000	0.000	0.533
Rest of World			0.313	0.407	0.451	0.257	0.480	0.328	0.384	0.419	0.328	0.396	0.190	0.333	0.273	0.225	0.205
Total			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Table E.4: Regionally Distributed Business Expenses of a Hypothetical Firm

			Regionally Distributed Expenses
County	Agriculture	1	$427
	Mining & Construction	2	$104
	Manufacturing	3	$4,055
	Trade & Transportation	4	$9,651
	Services	5	$1,876
Adjacent Counties	Agriculture	1	$237
	Mining & Construction	2	$67
	Manufacturing	3	$1,313
	Trade & Transportation	4	$2,156
	Services	5	$669
Rest of State	Agriculture	1	$23
	Mining & Construction	2	$7
	Manufacturing	3	$126
	Trade & Transportation	4	$3,063
	Services	5	$57
Rest of World			$12,470
Total			$36,300

DEFINING REGIONS

How should one define a region or set of regions for a socio-economic impact analysis? For people not accustomed to carrying out regional analysis, justifying a particular study area may not be easy. Even among experienced regional analysts, delineating a study region is a thorny, but important issue. The justifications of most study areas often are ignored—perhaps because the region is predefined (e.g., for an analysis of the fiscal impact of a tax cut within Alabama) or maybe because the region was the only available unit of observation for a "cross-section" study. Unfortunately, few universally accepted rules are available to help an analyst choose a study area. Thus, the regional setting for an impact analysis is usually somewhat subjective or arbitrary. Careful thought and judgment should always be exercised when delineating regions.

Other than a geographic aggregate, what is a region? There are as many answers to this question as there are people who use geographic settings for their analyses. Such diversity of opinion is due mostly to the different uses of spatial aggregates.[4] Most regional and urban analysts performing socio-economic impact analysis prefer the functional economic area concept for defining study regions.[5] Regions defined in this way explicitly consider the economic linkages and spatial dimensions between and among the residential

[4] Two common methods of defining regions are frequently used. First, regions are sometimes delineated along administrative or political boundaries (e.g., the State of Alabama). It is often claimed that since the institutional framework within which economic and social policies are designed and implemented is of overriding importance, then the geographic unit of analysis should coincide with the same administrative or political boundaries. Second, homogeneity of one form or another can be used to justify some regions. For example, one can envision coal mining regions, river-basin regions, air pollution regions, or even German-speaking areas. What binds these areas is usually some common physical, economic, social, or statistical characteristic.

[5] The concept of a functional economic area (FEA) appears attributable to Karl Fox: see K.A. Fox and T.K. Kuman, "The Functional Economic Area: Delineation and Implications for Economic Analysis and Policy." *Papers and Proceedings, Regional Science Association*, Vol. 15 (1965), pp. 57-85.

population and businesses located in the geographic area. In other words, commuting and trading patterns are of prime concern. This type of region is often called "nodal" because:

> …the region is perceived as being composed of heterogeneous nodes of different size (cities, towns, villages, and sparsely populated rural areas) that are linked together functionally. These functional links can be identified through observation of flows of people, factors, goods, and communications (Richardson, 1979, p. 21).

An examination of a map shows that population and businesses are not spread evenly over space, but are concentrated at specific locations called "agglomerations." The factors that generate these agglomerations are varied; e.g., transportation advantages (such as the confluences of several rivers), resource deposits, factor endowments, local infrastructure (such as goods schools and public transportation facilities), climate, and even proximity to firms that supply needed production requirements or provide ready markets.

Beyond the general conceptual guidelines for region types (above), there is little formal advice about defining regions. However, when an analyst decides to delineate a study area, the decision should based on his/her considered judgment—possibly form past experience and specific knowledge of the area under consideration. At a practical level, another important issue is determining the smallest geographic unit for which relevant data are available. For the most part, counties provide these data.[6] With respect to economic impact analysis, it is probably obvious that a region should be the geographic area in which the significant economic and social consequences of a RBS grant or loan occur.

The definition of the affected region must include all the ingredients of self-sustaining region/local businesses, local governments, and individuals. The

[6] Although some data are available at the census tract level (e.g., population and income) which possible could be used to delineate regions, the data needed to analyze economic impacts are most readily available only at the county level, unless one is willing to conduct expensive and time-consuming surveys.

region must reflect the limits of the economic activity associated with the affected population. This is not an easy definition to obtain and numerous "simplistic" attempts at a standard methodology have failed. Through experience, however, it has become obvious that the following considerations must be included in the definition.

- The ***residence patterns*** of the affected personnel determine where they are likely to spend their salaries. There are records of addresses of personnel which can serve as a means to document this consideration.

- The availability of local ***retail shopping*** is also a factor in the regional definition. The location of new malls or other popular shopping opportunities can dictate an expansion of a region if no comparable opportunities exist in the immediate vicinity.

- The ***"journey-to-work"*** time for employees often is a large part of the regional definition. On average, a journey-to-work time of one hour is considered a maximum criteria, however, some regions in the country are characterized by longer travel times for a typical commute. It is affected significantly by the quality of the transportation network, the availability of mass transit, and what impacts are felt during "rush hour" peaks.

- Local customs and culture often affect the boundaries of a region. Long versus short ***commute patterns***, willingness to approach the "inner city", the sense of local community, and other factors often lead to seeming inconsistencies in the regional limits. These are unfortunately, hard to address factors, but are nonetheless a fact of life which must enter into the analysis process and the definition of the region.

None of the considerations above can be used exclusively to define regions for all socio-economic studies. It is necessary that <u>all</u> these considerations enter into the decision process. This often requires input from local planning officials in addition to analysis of primary and secondary data sources (interviews, map, etc.).