

*Evaluation of the Appalachian Regional Commission's
Infrastructure and Public Works Program Projects*

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1. Introduction

1.1 Purpose

The Appalachian Regional Commission (ARC) conducted this evaluation of infrastructure and public works projects in order to determine the extent to which these projects have achieved their originally stated objectives. In addition, as part of the Commission's on-going performance evaluation process, the ARC wanted to assess how these project investments have contributed to attaining the Commission's strategic objectives.

These infrastructure projects represent a range of different types of projects typically funded by the Commission including, industrial parks and sites, water and sewer systems, access roads, and business incubators. The ARC selected a sample of 99 completed projects that were funded in part by the Commission in the 1990s. The sample of projects was drawn to reflect the Commission's current strategic funding priorities for infrastructure projects, and to represent the approximate proportions of each of the 13 Appalachian states' efforts for the several types infrastructure projects. The ARC also wanted to discern unforeseen impacts, trends among types of projects and to assess the wider economic impacts in the local communities.

The project evaluation focuses on key performance measurements and outcomes:

- the number of jobs projected and actually created or retained upon project completion;
- the leveraging rates for other project-related funds, including state, local, other federal and private investment;
- a determination of the agency's relative funding contribution;
- a calculation of the job creation rate attributable to ARC's investment once the impact other funds is considered;
- the diversification effects of the projects on the local economic base;
- the indirect economic effects attributable to the project;
- the impacts on the local tax base resulting from the projects;
- an impact/cost analysis of the projects; and
- quality-of-life improvements provided to residential households served by the water and sewer projects.

1.2 ARC's Infrastructure and Public Works Program

Since 1965, ARC has assisted in funding and developing a wide range of programs in the Appalachian Region, including highway corridors; community water and sewer facilities and other physical infrastructure; health, education, and human resource development; economic development programs, local capacity building and leadership development. Congress provided the authority for ARC to fund and develop such projects under Title II

of the Appalachian Regional Development Act of 1965. The rationale for ARC's Area Development program is to provide the basic building blocks that will enable Appalachian communities to create opportunities for self-sustaining economic development and improved quality of life.

The ARC's infrastructure and public works projects are designed to create and retain jobs, serve new and existing businesses, and promote public health. The above listed project objectives form the basis for the evaluation criteria used in this report. These infrastructure objectives are part and parcel of the Commission's broader strategic plan that guides ARC's investment in projects that contribute to one or more of the following goals:

1. a highly educated and skilled work force;
2. physical infrastructure for economic development and improved quality of life;
3. community and civic leadership development;
4. dynamic, entrepreneurial local economies;
5. a healthy work force.

In general, the projects that were evaluated relate to the second and fourth goals set forth in the Commission's strategic plan, with the business incubator projects exemplifying investments to promote dynamic, entrepreneurial local economies.

The sample projects are distributed over 13 states and represent 76 different primary impact areas, both non-metropolitan and metropolitan. In addition, these projects are distributed among counties of varying economic status, with projects in distressed counties qualifying for higher direct funding and lower matching requirements. ARC designates counties as one of four types: distressed, transitional, competitive, or attainment.* Projects in distressed areas are eligible for 80 percent ARC funding, transitional for 50 percent and competitive for 30 percent, while attainment counties are not eligible for ARC project funding. In addition, projects in distressed counties do not have to submit estimates for projected jobs, although in most cases such estimates were available.

The Infrastructure Program funds a variety of projects which have been classified into four basic categories for the purposes of this report: access roads, industrial parks, business incubators and water/sewer projects. These classifications were developed to enhance the analysis of projects, but the classifications are subject to some overlap.¹

* Distress designations are developed annually by the ARC and are based on county poverty rates and three-year unemployment rates that are 150 percent of or more than the national average and per capita market income that is two-thirds or less than the national average. The other economic designations likewise compare county economic performance with national rates, ranging from attainment counties that meet or exceed the national averages on these measures; to competitive counties that meet the national averages on unemployment and poverty rates but have 80 percent or less of national per capita market income; to transitional counties that are simply a residual category.

All projects in three categories—access roads, industrial parks, and business incubators—were considered economic development projects. Water and sewer projects were divided among economic development and residential development projects, although virtually all residential projects also demonstrate some level of direct or indirect economic development impact.

Industrial Parks: Twenty-two industrial park projects (22 percent of the sample) accounted for 23 percent of the total ARC investment reflected in the sample. Industrial park project grants tended to be smaller than the average sample project.

Business Incubators: Eleven business incubator projects (11 percent of the total analyzed sample) accounted for 9 percent of the total ARC investment reflected in the database. Business incubator project grants tended on average to be larger than the representative sample project.

Access Roads: Fifteen projects (15 percent of the sample) accounted for 11 percent of the total ARC investment reflected in the sample. Industrial access road project grants tended to be larger than the average sample project.

Water/Sewer Projects: Fifty-one water and sewer projects (52 percent of the sample) accounted for 57 percent of the total ARC investment reflected in the sample. Water and sewer projects tended to be smaller than the average sample project. Some water/sewer projects are residentially-oriented and not economic development-related. While these non-development projects are profiled individually, they do not represent the main thrust of analysis in this report.

The Sample: This analysis covers projects initiated between 1990 and 1997. Projects initiated before 1989 were not included because they were considered to be less relevant for assessment of the current form of the program, and because detailed ARC records were no longer available for those years. Projects initiated after 1997 were not examined because not enough time had passed to observe the subsequent new business occurring at their sites

It is important to note that this report analyzes only a portion of ARC infrastructure and public works project investments. For example, a total of 1,155 water and sewer projects were developed from 1990 to 1997 and 519 were ultimately completed and closed. Thus, the final sample of 51 water and sewer projects represents 10 percent of all closed water and sewer projects during the period examined. The final sample was selected to focus on economic development-related projects and to assure reasonable representation of projects by type, geographic distribution and other factors. In addition, the final sample selection attempted to focus on infrastructure and public works projects that were the most important fields of ARC infrastructure investment. Some categories were also excluded or modestly sampled due to diminishing interest of many states (e.g., downtown

revitalization projects) or complex, multiple-objectives where assessment went beyond the scope of this project (e.g., telecommunications, solid waste). A more detailed comparison of the universe of infrastructure and public works investment with the sample projects used in this report can be found in Appendix B.

1.3 Methodology

Project development was essentially divided into six phases:

1. Project Selection & Classification. The first phase identified projects and classified them. This involved a review of ARC records and a computerized classification of selected projects into a database for future ARC use. This database is included as Appendix I, which is available as an electronic Access database supplement to this report.

2. Direct Interviews. One to four interviews were conducted for each project, most often with local or regional development staff, local government and civic leadership and private sector representatives. The results of these interviews were integrated into a project profile covering the following key topics:

- project area distress data;
- project data and budget information;
- project fiscal and economic impact analyses;
- economic trend analyses of primary impact counties;
- economic vitality analyses of primary impact counties;
- interviewee information;
- qualitative project objectives and outcomes; and
- impact comments and discussion.

The interviews and analysis of the results provided essential documentation of the nature of the projects and their direct economic effects. These in-depth interviews were conducted by the consulting team with selected local officials, development staff and private sector representatives. Interviews were conducted via telephone and relied upon formal interview guides and procedures. The interview instrument is in Appendix I.

In addition to phone interviews, eight site visits were made to validate project results and to develop more detailed case studies. Narratives of these site visits can be found in Appendix A of this report. Site visits were selected to reflect a reasonable representation of project types, regional geography and area demographics.

3. Baseline Economic Analysis: Background economic information on the baseline economic conditions was developed for each of the 76 primary impact counties with project investments. This phase of the analysis developed county-level economic profiles in order to detail the general economic conditions of project areas. In addition, the performance of project counties was compared to national trends based on broader measures of economic well-being including, economic diversification, entrepreneurial

vitality and business growth. In most cases the size of the project investment was too small to definitely link to the changes in the local economy, but in several cases it was possible to identify local economic changes that corresponded to project impacts.² In general, however, the baseline economic analyses situates the project impacts within economic trends of the counties, particularly the extent of economic diversification and entrepreneurship. Detailed tables reflecting these analyses are available in Appendices G and H, electronic Access database supplements to this report.

4. Analysis of Project Outcomes: This phase of the research analyzed project outcomes by comparing the anticipated and actual project outcomes in terms of the key performance measures used by ARC: new and retained businesses served, new and retained jobs, and new and existing households served. In addition, this part of the research examined the leverage rates of ARC dollars invested in terms of other public and private dollars invested. Furthermore, through the results of the project interviews, the research was able to compile data on additional private investment that was stimulated by the projects.

5. Fiscal and Economic Impact Analysis. This phase of work modeled the economic impacts of projects on their core counties. The economic impacts were measured either by new jobs and personal income generated from business attraction and expansion, or by existing jobs and personal income retained by saving businesses that would otherwise have been forced to close down or move out. Additional economic impacts on leveraging private sector investment and fiscal impacts on increasing local tax revenues were also documented. For each of these impact measures, the ratio of impacts per dollar of ARC investment and per dollar of total public investment were assessed. Relative ratios of benefits and costs were also examined.

6. Qualitative Objectives and Outcomes. In addition to these quantitative outcomes, the interviews conducted with economic development officials and various community leaders in each community served by the projects helped identify certain key trends and commonalities among project types. A great many cases were cited as examples in which the projects generated qualitative objectives and outcomes not readily measured by the usual performance measurements. This phase of the research provided yet another facet of the evaluation and offers a unique and important contribution to the overall evaluation process that is often overlooked in purely quantitative approaches.

The resulting report was designed to meet two goals for the Commission: (1) to assist ARC in its internal evaluation of past program performance, identifying opportunities for future improvement, and (2) to facilitate the public's understanding of the benefits of ARC's infrastructure investments.

1.4 Coverage of This Study

Three additional points should be noted about the coverage of the projects and analysis in this study:

The report does not cover all of ARC public works investments through the program. Projects included in the evaluation sample were limited to those funded from 1990 to 1997.³ Those funded earlier were often without sufficiently detailed records, while more recently funded projects were in general not mature enough to allow for reasonable observation of implementation and impacts.

The report is primarily concerned with economic development impacts. The principal focus of the study is on job creation, business service, income growth, economic diversification, tax revenues, and changes in total business output that can be attributed to ARC investments. While residential water and sewer projects receive some analysis and discussion of quality-of-life impacts, changes in public health that may have resulted from various projects are not quantified.

Some indicators provide a context for local and project analysis but do not provide a basis for inferring project cause and effect. The report provides a variety of traditional and innovative economic indicators for project impacts, including growth trends, business retention, job replenishment, business vitality, and industrial diversification. In general, these indicators provide a context for project analysis and a better understanding of the project area economies and their needs. In many instances, these analyses also inform qualitative discussions of how some projects affected land use and development patterns, or, for example, entrepreneurial vitality in the primary impact areas. The economic diversification and job growth analysis, however, does provide measures of how projects affected the existing economic conditions.

2. Overview of Projects

This section breaks down projects into various categories and explains general trends among those categories, including project types, locations, demographic settings, distress levels of project counties, and project investment levels. This section sets the stage for a detailed evaluation of impacts and trends among projects.

2.1 Project Types

Of the 99 projects analyzed, 87 reflected objectives and outcomes directly related to economic development, while the remainder were residential water or sewer projects that related to quality-of-life objectives. Thirty-nine water and sewer projects were directly related to economic development, by design or outcome or both. Some water and sewer projects were integral pieces of economic development efforts—for example, sewer lines on which industrial location was contingent—while others had more secondary economic development purposes. In total, the sample encompassed 99 projects:

- 51 water/sewer projects;
- 22 industrial parks;
- 11 business incubators; and
- 15 access roads.

2.2 Project Locations

There is a clear concentration of project types in various states as shown in Table 2.1. More than half of all industrial park projects were concentrated in three states (Pennsylvania, Kentucky, and Mississippi). Nearly three-quarters of all incubator projects were located in Pennsylvania, New York, and Maryland. Access road projects were overwhelmingly concentrated in Mississippi (9 of 15), while Kentucky, Georgia, and Alabama accounted for almost half of the most common type of project, namely, water and sewer projects.

Because the ARC project award process is generally generated from the locality up, rather than top-down, it seems clear that the distribution of project types and geographical concentrations is more reflective of local priorities and opportunities than any overarching policy scheme. The degree to which the sample of projects falls within common strategic parameters is more a testimony to unified need and outlook among applicant areas than any policy discipline from ARC itself.

State	Industrial Park	Incubator	Access Road	Water/Sewer	Total
Alabama	2	1	0	8 (5 ED)	12
Georgia	1	0	0	7 (7 ED)	8
Kentucky	3	0	0	10 (6 ED)	13
Maryland	0	2	0	0	2
Mississippi	3	1	9	4 (2 ED)	17
North Carolina	0	0	0	4 (4 ED)	4
New York	0	3	2	1 (1 ED)	6
Ohio	2	0	2	1 (1 ED)	5
Pennsylvania	6	3	1	1 (1 ED)	11
South Carolina	1	0	1	1 (1 ED)	2
Tennessee	1	0	0	5 (5 ED)	6
Virginia	1	0	0	4 (3 ED)	5
West Virginia	2	1	0	5 (3 ED)	8
Total	22	11	15	51 (39 ED)	99

Considered on a sub-regional basis, the northern part of the Appalachian region had the highest number of industrial park and incubator projects; the central portion was most concerned with water and sewer improvements for economic development purposes; and the southern portion focused on water projects and industrial access roads.

2.3 Project Demographic Settings (Metropolitan vs. Non-metro Projects)

Of 406 ARC counties, 109 counties are classified as metropolitan, and the other 297 counties are classified as non-metropolitan. Twenty-five sample projects were developed in metropolitan ARC counties, so the sample was distributed between metro and non-metro counties in identical proportions to that found in the Appalachian Region. Of the metro county sample projects, only one (Marion, TN) was in a community designated as distressed prior to project development. Throughout the Region, only two metropolitan counties are designated as both distressed and metropolitan (the other is Fayette County, PA).

As shown in Table 2.2, the metro/non-metropolitan distribution of projects in the sample generally corresponded to the spread in ARC counties, although some states demonstrated a higher propensity for metropolitan project development. Four states—Maryland, New York, Ohio, and South Carolina—funded projects in metro areas at a rate 10 percent greater (or more) than the actual distribution of metro area counties.

Among the metropolitan projects, nine were water/sewer, six were industrial park, four were access road, and six were business incubator projects. This lower emphasis on water/sewer projects seems natural. The lack of emphasis on rural incubators reflects the

inherent difficulties of scale for rural incubator efforts. But in a broader sense, the gap also reflects the Region's considerable lag in start-up activity and lower entrepreneurial survival (see Section 6).

Table 2.2						
Appalachian Region (406 Counties)						
Non-metro/Metropolitan Project Distribution						
State	ARC Counties			Projects		
	Metro	Non-Metro	% Non-Metro	Metro	Non-Metro	% Non-Metro
Alabama	14	23	62%	5	7	58%
Georgia	13	24	65%	0	8	100%
Kentucky	5	44	90%	2	11	85%
Maryland	2	1	33%	2	0	0%
Mississippi	0	22	100%	0	17	100%
North Carolina	9	20	55%	2	2	50%
New York	5	9	64%	3	3	50%
Ohio	8	21	72%	3	2	40%
Pennsylvania	20	32	62%	4	7	64%
South Carolina	5	1	17%	2	0	0%
Tennessee	13	37	74%	1	5	83%
Virginia	3	20	87%	0	5	100%
West Virginia	12	43	78%	1	7	88%
Total/Average	109	297	73%	25	74	75%

2.4 Project Area Distress Levels

Distress designations are an integrated barometer of economic well-being maintained by the ARC. Every year the Commission determines the economic status of the 406 counties in the Appalachian Region, with each county assigned to one of four economic categories: distressed, transitional, competitive, or attainment. The designations are based on three economic measures that are benchmarked to national averages for the poverty rate, three-year average unemployment rate and per capita market income (i.e. per capita income less transfer payments). Distressed counties are eligible for additional funding and lower matching requirements (20 percent), with matching funds requirements rising for transitional (50 percent) and competitive counties (80 percent), and with attainment being deemed ineligible for funding.

The economic status of project counties was evaluated for the sample and compared with the distribution for the Appalachian Region as a whole. In general the sample set of project counties was found to be representative of ARC's distress rankings for 399 of the 406 counties based on fiscal year (FY) 1988 designations. The four-level designation

system was implemented only as of FY1997, so the application of these categories to FY1988 data is really a retrospective projection of the criteria.

- Of the 399 counties in the database as of 1988, 90 (23 percent) were distressed, 289 (72 percent) transitional, 16 (4 percent) competitive, and 4 (1 percent) attainment. Seven counties that were not designated as ARC counties in 1988 were excluded from this analysis.
- By contrast, among the 76 project sample counties, 18 (24 percent) were distressed in 1988, 57 (75 percent) transitional, and 1 (1 percent) competitive. None were in the attainment category. In other words, the concentration of distress was only slightly greater in project counties than in non-project areas. To use the ARC's scale of distress designations (1 being distressed, 2 transitional, 3 competitive, and 4 attainment), non-project counties had a 1988 average distress designation of 1.83, while project counties had an average distress rate of 1.80.

As a matter of ARC policy, no projects were developed in “attainment” counties. Thus, only competitive county projects are underrepresented in this sample (see Appendix E for more details). Project impacts on distressed areas are discussed more fully in section 5.2.

2.5 Project Budget Levels

The total ARC investment in the 99 reviewed projects was \$32,433,047. For the most part, original ARC allocations were maintained, even when project costs increased. Twenty-four projects (24 percent of the total in the sample) were developed in counties designated as distressed at the time of the grant. Because of the location of multiple projects in some counties, these projects represented 18 of the 76 project counties (24 percent) of the sample. The total ARC investment in distressed county projects was \$6,404,885 or 20 percent of the total ARC investment represented by the sample. Seventy-five projects in 58 counties designated as “transitional” accounted for the remaining \$26,028,162 (80 percent) of the investment represented by the database.

Non-metropolitan counties in the ARC Region accounted for \$23,676,124 or 73 percent of the total ARC investment in the project sample. These funds covered 74 projects in 54 counties. Metropolitan ARC counties received \$8,756,922 or 27 percent of the investment represented in the sample. Twenty-five projects were located in 22 metropolitan counties. By contrast, of the 406 ARC counties, 27 percent are classified as metropolitan and 73 percent as non-metropolitan—a virtually identical breakdown. Further analysis of project geography and metro/non-metro breakdowns is detailed in following sections.

¹ More detailed information on methodology utilized to evaluate the progress of project counties relative to distress designations can be found in Appendix E.

2.6 Summary Project Sample Overview

While the variety and complexity of ARC investments discourage any notion of an “average” project, the sample of investments selected for analysis can be said to be generally representative. The sample:

- covers all states in the ARC region;
- reflects a metropolitan/non-metropolitan mix almost identical to the Region as a whole;
- includes project counties reflecting all eligible economic designations;
- incorporates a robust distribution of projects in the four major classifications—water/sewer, access road, industrial park and site, and business incubator;
- is weighted most heavily toward water and sewer projects, reflecting the mix of investments in the universe of public works and infrastructure projects; and
- includes both very small and very large investments, in addition to many of “average” scale.

3. Overall Program Impact Measures

In order to accurately measure the overall impacts of ARC's infrastructure and public works projects, it is important to divide these projects into two categories.

- 1) Economic development projects: These are public investment projects intended to promote business development by attracting new jobs or retaining (saving) threatened existing jobs.
- 2) Residential projects: These are public investment projects intended to improve basic public health and quality of life by providing basic water and/or sewer services to residential areas that have lacked them.

Most of the projects (87 of 99 studied) were economic development projects—aimed at promoting economic development. The impacts of those projects were measured in terms of **jobs** (new or retained), **personal income (wages)** associated with those jobs, **private investment** leveraged by the public funding, and **tax revenue** associated with new private investment. This chapter reviews the overall findings for each of those measures, as well as ratios of impacts per public dollar spent on these projects.

For the 12 residential projects, the number of **households served** is also measured. Those projects were **not** intended to directly attract business and jobs, and hence showed no immediate impacts on those measures. However, they did in some cases also improve the local capacity for future economic development, and those types of qualitative impacts are noted in the individual project discussions in Appendix I.

3.1 Direct Effects: Anticipated vs. Actual Results

Goals. In the initial project applications for funding, local applicants are required to estimate the number of jobs to be created or retained, the number of businesses to be served or retained, and the number of new or existing households to be served directly by the project. The job and business goals were applicable for industrial and commercial projects, while the household goals were applicable for residential water/sewer projects.

Measures of Anticipated vs. Actual Impact. The aggregate results far exceeded projections in each of those impact measures, as shown in the following table:

Table 3.1			
Direct Impact: Aggregate Projections and Results			
	Projected Outcomes	Actual Outcomes	Actual as a Percent of Goal
<u>Economic Development Projects</u>			
New businesses served	142	415	292%
Retained businesses served	559	626	112%
New jobs	15,884	23,377	147%
Retained Jobs	8,693	16,387	189%
<u>Residential (Public Health) Projects</u>			
New households served	1,929	4,553	236%
Existing households served	13,076	14,488	111%

The “new jobs” fulfillment rate is noteworthy for two reasons. First, unlike certain other federal programs, ARC investments do not always require a guarantee of job creation before granting the funds, so projections of job impact can be somewhat speculative. Second, there is a natural inclination for applicants to “stretch the envelope” on job projections in order to enhance the perceived likelihood of project funding.

Of course, it would be possible for a handful of wildly successful projects to distort aggregate totals, even if the majority of projects failed to meet or even approach projections. But this didn’t seem to be the case for the sample reviewed for this report. In fact, in every category for which projections were made, between 72 percent and 100 percent of all projects with projections in those categories (jobs created and households served, respectively) met or exceeded expectations.

Portion of Projects Meeting Goals. Twenty-four projects—most of them residential water and sewer investments—did not submit initial projections regarding jobs created, jobs retained, or businesses served. Ten of these eventually showed “unanticipated results” or impacts in one or more categories. All projects with initial projections were measured for achievement of projections. The portion of projects meeting or exceeding each of the major goals is summarized as follows:

- **New businesses served:** 59 projects of 72 (82 percent) met or exceeded expectations.
- **Retained businesses served:** 36 projects of 46 (78 percent) met or exceeded expectations.
- **Jobs created:** 58 projects of 81 (72 percent) met or exceeded expectations.
- **Jobs retained:** 31 projects of 38 (82 percent) met or exceeded expectations.

- **Households served:** 23 projects of 23 with projections (100 percent) met or exceeded expectations.
- **Existing households served:** 27 projects of 27 (100 percent) met or exceeded expectations.

These results should be seen as based on fairly rigorous success standards because several types of project outcomes were excluded from meeting the “minimum success” thresholds:

- projects that approached but did not reach projections;
- projects that had large impacts but were nonetheless below projections; and
- projects such as recent industrial parks that are still in “immature” stages.

Eighty-three of the eighty-seven economic development projects studied achieved significant, measurable outcomes. Included are all industrial park, business incubator, and access road projects, as well as 35 of 39 (non-residential) water and sewer projects. The other four projects either had an anticipated business cancel its plans or had an existing business subsequently close up (or move out).

While variations and shortfalls certainly exist for some measures in some categories, the general conclusion is that each project classification met or exceeded statistical projections. As the site visit narratives show (see Appendix A), viewing projects of all types within their economic and social contexts offers a better understanding of the project impacts and the value of the initial investment.

Results by State. As the table below indicates the results on businesses, jobs and households served largely reflect differences in the mix of projects. The following analysis is useful mainly as information about the project mix within a state, not as a scorecard or yardstick for comparison between states.⁴ In addition, the table is useful in the review of individual projects within the context of a state’s total ARC program investment.

Within each state, the number and dollar value of total investments varied, as did the impacts generated from the project. For example, South Carolina’s high job impact numbers were almost all generated by a single very large project. By contrast, Maryland’s projects include a large proportion derived from workforce development and technical assistance efforts. The types of projects reflect state priorities that determined both the scale of required investment and the nature of outcomes. For instance, incubators were a high priority in New York, while access roads were a high priority in Mississippi.

	No.	ARC Investment	Businesses		Jobs		Households
			Served	Retained	New	Retained	Served
Alabama	12	\$3,042,220	93	51	3,873	2,400	2,002
Georgia	8	\$1,450,150	42	8	2,816	335	388
Kentucky	13	\$3,835,265	42	250	1,747	1,000	8,800
Maryland	2	\$724,000	26	101	835	8,219	0
Mississippi	17	\$3,557,290	22	9	2,534	365	770
North Carolina	4	\$680,418	22	1	1,391	100	0
New York	6	\$1,055,000	49	1	1,160	62	0
Ohio	5	\$1,023,657	5	3	1,310	1,117	0
Pennsylvania	11	\$3,017,321	48	15	1,174	360	900
South Carolina	2	\$2,695,000	2	0	3,600*	0	0
Tennessee	6	\$2,081,546	24	133	1,350	1,719	5,587
Virginia	5	\$3,010,215	6	31	288	250	150
West Virginia	8	\$6,260,965	34	23	1,299	460	444
Total	99	\$32,433,047	415	626	23,377	16,387	19,041

* includes 3,000 jobs at BMW plant in Greenville-Spartanburg, South Carolina (project 11163)

3.2 Indirect and Induced Effects

Whereas “direct effects” refer to the growth of businesses located at the project site that benefit directly from the project completion, “indirect and induced effects” refer to additional economic growth typically located elsewhere in the community that follows as a consequence of the direct effects. These additional effects are commonly analyzed in studies of localized economic impacts associated with business relocation and expansion.

Methodology:

Definitions. The economic development projects were intended to either, (a) support the growth or attraction of new business activity that otherwise would not occur in the area, or, (b) support the retention of existing business activity that was economically threatened and which would otherwise decline or move out of the region. The former lead to “new” jobs and income, and the latter lead to “retained” jobs and income.

Treatment of New Activity. For the new jobs and income, we can distinguish three classes of impacts:

- **Direct effects.** The business activity of the output, jobs and income directly related to the project are the “direct economic effects” of the project.

- **Indirect effects.** In addition, projects have broader impacts elsewhere in the community such as expanding business for local suppliers of products or services that service the new businesses. The additional output, jobs, and incomes for such suppliers are typically referred to as “indirect economic effects.”
- **Induced effects.** Another impact is the so-called induced effect which includes the expansion of local commercial business as a result of income re-spent by persons working at the new businesses (the direct new hires) and suppliers (the indirect employment effect).

The additional indirect and induced effects are often referred to as "multiplier effects." The total effect on jobs and associated income is thus the sum of the direct project effects and the indirect and induced effects. Since most of these local areas are characterized by significant unemployment, and relatively low labor force participation rates, it is reasonable to expect that the additional jobs and income go to local residents, and are not merely replacing jobs and income from other existing business activities.

Treatment of Retained Activity. This study does not estimate indirect or induced effects associated with business retention since it is unclear whether or not all of the business losses would actually occur without the public investment. If the retained jobs and income would indeed be lost without further public investment, then there could be potential negative indirect and induced effects—leading to additional job loss for existing businesses elsewhere in the local area. Nonetheless, the uncertainty about how to treat retained businesses and jobs meant that the prudent approach was not to attribute such indirect and induced effects to retained businesses.

Methodology for Analysis. The measures of direct, on-site impacts on business attraction and retention came directly from interviews with local officials, who were asked to report the actual number of affected businesses and jobs, and to estimate the associated personal income, including existing or saved jobs. For cases in which there were no reliable estimates of income effects, data from the state labor agency and the US Bureau of Labor Statistics were used to indicate the average wage per worker (based on separate data by county and by industry).⁵

The measures of indirect and induced effects were developed using the Impact Analysis for Planning (IMPLAN) economic model.⁶ It is important to note that multiplier effects differ by industry and by area. Industries (types of business) can have larger or smaller indirect and induced effects, depending on the portions of dollars going to pay workers and to buy different types of equipment and supplies. Locations can have larger or smaller indirect and induced effects, depending on the portion of suppliers and consumer-serving businesses located within the area. For these reasons, employment, income and business sales data for the year 1997 were obtained by industry, for each of the counties associated with the 99 projects studied. In cases in which projects involved multiple counties, impacts were estimated for the multi-county area. The IMPLAN model was then run to calculate employment, income, and business sales multipliers associated with growth or shrinkage of each industry in each county. For each project, the types of

business (industry) associated with the business expansion or attraction were identified, and the applicable multipliers were then applied. For projects in which the specific types of business were not all known, multipliers representing an average of the area's dominant industries were applied.

3.3 Job Impacts: Direct, Indirect and Induced Effects

New Jobs. A total of 23,377 new jobs were directly created as a result of the ARC-funded projects. These direct effects include only jobs at the sites served directly by the ARC-funded infrastructure and public works investments. In addition, it is estimated that another 20,954 new jobs were created away from the project sites by indirect effects on off-site suppliers and induced effects on consumer re-spending of additional worker incomes. These indirect and induced effects follow as a consequence of the directly created new jobs. (See Appendix C for further discussion of the calculation of indirect and induced effects.) All of these new jobs (both direct and indirect/induced effects) were created because of the projects.

Retained Jobs. Another 16,387 existing jobs were directly retained or saved as a result of the ARC-funded projects. It is reasonable to assume, based on project application data, that those directly-affected jobs would most likely have been lost without the projects. The extent of their indirect effects on supplier businesses and induced effects on consumer-serving businesses is less clear. Those businesses had already existed before the projects were implemented. If the projects had not been implemented without ARC funding, the directly affected businesses may have responded by closing or by relocating, or they may have survived in their current locations by adjusting products and services for other markets. If we assume that all of the business activity associated with indirect (supplier) and induced (consumer) sales would indeed have disappeared, then it would be reasonable to add indirect and induced effects associated with the retained jobs. While that is a distinct possibility, this study adopted a more conservative approach that counted additional indirect/induced effects based on new jobs, but not any additional indirect/induced effects based on retained jobs.

Total Jobs. The estimated total number of job impacts of the ARC-funded sample projects was 44,331. This includes direct new jobs and indirect/induced new jobs. It does not include the retained jobs, nor estimates of indirect/induced effects for retained jobs. This total impact can be broken down by project type, as follows:

- 7,998 total jobs created from 22 industrial park projects (average of 364 each);
- 3,869 total jobs created from 11 business incubator projects (average of 352 each);
- 3,723 jobs created from 15 access road projects (average of 248 each); and,
- 28,741 jobs created from 39 water/sewer projects (average of 737 each, but this drops to 598 when the large BMW project is excluded).

**Table 3.3
Total Overall Job Impacts**

	No. of Projects	Retained Jobs	Direct New Jobs	Indirect & Induced New Jobs	Direct + Indirect/Induced New Jobs
Project Type					
Access Road	15	1,093	2,366	1,357	3,723
Business Incubator	11	8,338†	2,220	1,649	3,869
Industrial Park	22	1,272	4,444	3,554	7,998
Water/Sewer-Business	39	5,684	14,347	14,394	28,741
Water/Sewer-Residential	12	0	0	0	0
Total	99	16,387	23,377	20,954	44,331
Area Rating (pre-project)					
Distressed	24	2,779	1,758	828	2,586
<u>Transitional</u>	<u>75</u>	<u>13,608</u>	<u>21,619</u>	<u>20,126</u>	<u>41,745</u>
Total	99	16,387	23,377	20,954	44,331
State					
Alabama	12	2,400	3,873	3,089	6,962
Georgia	8	335	2,816	1,331	4,147
Kentucky	13	1,000	1,747	745	2,492
Maryland	2	8,219	835	631	1,466
Mississippi	17	365	2,534	1,112	3,646
North Carolina	4	100	1,391	902	2,293
New York	6	62	1,160	449	1,609
Ohio	5	1,117	1,310	789	2,099
Pennsylvania	11	360	1,174	903	2,077
South Carolina	2	0	3,600*	8,714	12,314
Tennessee	6	1,719	1,350	602	1,952
Virginia	5	250	288	228	516
<u>West Virginia</u>	<u>8</u>	<u>460</u>	<u>1,299</u>	<u>1,459</u>	<u>2,758</u>
Total	99	16,387	23,377	20,954	44,331

Note: No estimates are made of the indirect and induced effects of retained jobs.

† Retained jobs refer to the Hagerstown Technology Innovation Center that provided technology assistance to businesses located outside the incubator.

* includes 3,000 direct jobs at BMW plant (project 11163) and their multiplier effects

These numbers reflect differences in the average size and scale of the projects, and not necessarily project success. A full breakdown of the job impacts is shown in Table 3.3. Table 3.3 also shows that average job creation was relatively greater for the projects in transitional areas than for the projects in fully distressed areas. That reflects a combination of two factors:

- attracting business is harder in the more distressed areas, and hence the average number of jobs created per project is smaller in those areas; and
- most of the residential projects were in the distressed areas and were aimed at public health rather than immediate economic development.

3.4 Personal Income: Direct, Indirect and Induced Effects

Additional Income. Personal income derived from wages from newly created jobs has a variety of local economic impacts. While the impacts of economic development projects are often tracked in terms of job creation, the most tangible benefit to people in the target areas comes from the enhancement of their incomes. Another advantage of measuring program impact in terms of personal income is that the income measure reflects differences between the creation of high-paying jobs and the creation of low-paying jobs. Because counties in which these projects occurred were characterized by high unemployment and low income levels, it is reasonable to assume that essentially all of the additional income created (directly or indirectly) by these projects flows to existing residents of the county.

Measurement. The estimates of direct effects on retained wages (from saved jobs at existing businesses) and on new income (from new jobs attracted) came from interviews with local officials, and were supplemented when necessary with average wage data from the U.S. Bureau of Labor Statistics. The estimates of indirect and induced effects on personal income came from the IMPLAN model.⁷

Overall Results. Table 3.4 shows a breakdown of the retained wages as well as the new (direct) wage income and indirect/induced income impacts, by project type, area classification and state. Overall, it shows that the 87 (case study) economic development projects helped to directly retain \$440.7 million of existing wages at threatened jobs, attract \$576.9 million of new wages at the project sites, and led to a net expansion of \$950.3 million of personal income. As with the job impacts, the personal income impacts were largest for the water/sewer (rather than industrial park and business incubator) projects and for the transitional rather than distressed counties.

Wage Levels. The new jobs directly generated by these ARC-funded projects were primarily industrial rather than commercial or service jobs, and thus would be expected to have wage levels higher than the overall average in those counties. An attempt was made to document these differences. However, it was concluded that it was not possible to accurately measure such differences in wage levels for this study. The reason is that the project information on directly generated jobs and payroll from ARC-supported projects did not sufficiently distinguish levels of part-time and full-time jobs. Published county-wide data on wage rates (from the U.S. Department of Commerce's "County Business Patterns" database), on the other hand, do adjust wage statistics to reflect hourly or full-time rates. Thus, there was not sufficient consistency in the definition of pay per job to allow for a comparison of project and overall wage rates. Nevertheless, there was a clear

consensus, indicated in the local interviews, that the ARC-funded projects had indeed broadened available job opportunities and provided desirable types of jobs.

	No. of <u>Projects</u>	Income From <u>Retained Jobs</u>	Income from New Jobs		
			<u>Direct Wage Income</u>	<u>Indirect & Induced Income</u>	<u>Total Direct+ Indirect/Induced</u>
Project Type					
Access Road	15	39,198,400	56,255,240	29,001,911	85,257,151
Business Incubator	11	272,665,760	57,057,400	40,464,049	97,521,449
Industrial Park	22	27,314,000	110,695,400	59,141,697	169,837,097
Water/Sewer-Business	39	101,504,000	352,855,900	244,770,069	597,667,969
<u>Water/Sewer-Residential</u>	<u>12</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	99	440,682,160	576,863,940	373,377,726	950,283,666
Area Rating (pre-project)					
Distressed	24	45,600,000	35,404,800	13,371,656	48,818,456
<u>Transitional</u>	<u>75</u>	<u>395,082,160</u>	<u>541,459,140</u>	<u>360,006,070</u>	<u>901,465,210</u>
Total	99	440,682,160	576,863,940	373,377,726	950,283,666
State					
Alabama	12	\$39,448,000	\$91,094,000	\$55,616,572	\$146,710,572
Georgia	8	\$8,664,000	\$55,420,000	\$21,329,680	\$76,749,680
Kentucky	13	\$16,600,000	\$28,743,000	\$12,860,748	\$41,645,748
Maryland	2	\$270,149,760	\$25,082,400	\$19,011,569	\$44,093,969
Mississippi	17	\$8,590,000	\$61,826,740	\$26,648,846	\$88,475,586
North Carolina	4	\$2,226,000	\$33,352,000	\$16,346,684	\$49,698,684
New York	6	\$920,000	\$19,405,000	\$7,753,080	\$27,158,080
Ohio	5	\$40,218,400	\$47,678,400	\$15,433,443	\$63,111,843
Pennsylvania	11	\$9,466,000	\$23,446,000	\$13,253,678	\$36,699,678
South Carolina	2	\$0	\$126,600,000	\$147,778,200	\$274,378,200
Tennessee	6	\$28,000,000	\$27,616,400	\$10,950,426	\$38,566,826
Virginia	5	\$6,000,000	\$6,000,000	\$2,377,300	\$8,377,300
<u>West Virginia</u>	<u>8</u>	<u>\$10,400,000</u>	<u>\$30,600,000</u>	<u>\$24,017,500</u>	<u>\$54,617,500</u>
Total	99	\$440,682,160	\$576,863,940	\$373,377,726	\$950,283,666

Note: See text for discussion of indirect and induced effects of retained jobs

3.5 Effects on Public and Private Investment

Overview. ARC does not fully fund any infrastructure or public works projects. Rather, ARC co-funds projects which also have some other federal funding assistance. The other federal funding is predominantly from the Economic Development Administration, the

Farmer's Home Administration of the U.S. Department of Agriculture, the U.S. Department of Housing and Urban Development (through Community Development Action Grants) or the Federal Highway Administration of the U.S. Department of Transportation. In addition, most of those other federal programs also require some state or local matching funds. This section reviews these funding patterns in two parts. First, the mix of public funding is described. Then the leveraging of private sector funding is analyzed. A full breakdown of the public funding by project type, area distress level, and state is shown in Table 3.5.

	No. of Projects	ARC \$	Fed \$	State \$	Local \$	Total Public \$
Project Type						
Access Road	15	\$3,425,970	\$2,165,763	\$1,130,000	\$3,370,525	\$10,092,258
Business Incubator	11	\$2,984,123	\$4,272,400	\$990,760	\$3,887,485	\$12,134,768
Industrial Park	22	\$7,561,457	\$9,948,802	\$10,329,541	\$9,909,451	\$37,749,251
Water/Sewer-Business	39	\$14,599,922	\$9,775,336	\$4,769,900	\$17,816,010	\$46,961,168
Water/Sewer-Residential	12	\$3,861,575	\$2,324,000	\$0	\$4,024,956	\$10,210,531
Total	99	\$32,433,047	\$28,486,301	\$17,220,201	\$39,008,427	\$117,147,976
Area Rating (pre-project)						
Distressed	24	\$6,404,885	\$1,712,986	\$0	\$7,590,199	\$15,708,070
Transitional	75	\$26,028,162	\$26,773,315	\$17,220,201	\$31,418,228	\$101,439,906
Total	99	\$32,433,047	\$28,486,301	\$17,220,201	\$39,008,427	\$117,147,976
State						
Alabama	12	\$3,042,220	\$7,134,526	\$80,000	\$7,155,433	\$17,412,179
Georgia	8	\$1,450,150	\$2,256,000	\$269,000	\$957,610	\$4,932,760
Kentucky	13	\$3,835,265	\$2,926,422	\$2,278,000	\$7,023,636	\$16,063,323
Maryland	2	\$724,000	\$2,172,000	\$0	\$730,100	\$3,626,100
Mississippi	17	\$3,557,290	\$2,005,040	\$60,000	\$2,803,888	\$8,426,218
North Carolina	4	\$680,418	\$651,900	\$651,900	\$565,029	\$2,549,247
New York	6	\$1,055,000	\$1,350,000	\$1,245,760	\$1,979,454	\$5,630,214
Ohio	5	\$1,023,657	\$1,995,763	\$338,891	\$1,073,242	\$4,431,553
Pennsylvania	11	\$3,017,321	\$3,712,400	\$8,435,832	\$5,862,038	\$21,027,591
South Carolina	2	\$2,695,000*	\$0	\$595,000*	\$4,089,935*	\$7,379,935*
Tennessee	6	\$2,081,546	\$130,250	\$0	\$634,992	\$2,846,788
Virginia	5	\$3,010,215	\$1,300,000	\$665,818	\$2,873,255	\$7,849,288
West Virginia	8	\$6,260,965	\$2,852,000	\$2,600,000	\$3,259,815	\$14,972,780
Total	99	\$32,433,047	\$28,486,301	\$17,220,201	\$39,008,427	\$117,147,976

*includes BMW plant infrastructure: \$2,195,000 ARC, \$595,000 state, \$3,555,731 local = \$6,345,731 total.

Public Funding Mix. Because of the typical mix of public funding in ARC projects, ARC cannot take full credit for the economic impacts of any of its projects. It can, however, take credit for helping to leverage other federal, state, and local funds, as well as private funds. Overall, ARC funding for these projects totaled \$32,433,047, which is 28 percent of the total public cost (\$117,147,976) for these projects. Other federal funding averaged 24 percent of project cost, while states invested an average of 15 percent, and local funding averaged 33 percent of the total. Viewed another way, each dollar of ARC investment helped to make possible a package of \$2.61 in other public funding, adding up to \$3.61 of total public funding.

Overall, the ARC portion of total public funding was:

- 33 percent of all public funding for access road projects;
- 25 percent of all funding for business incubator projects;
- 20 percent of all public funding for industrial park projects;
- 31 percent of all public funding for water/sewer projects serving business sites; and
- 38 percent of all public funding for water/sewer projects serving residential areas.

The ARC portion of public funding was 41 percent for projects in distressed areas and 26 percent for projects in transitional areas. All together, these figures show that ARC funding has played a relatively larger role in those areas that are most in need—especially economically distressed areas—and in those projects that are most critical for basic household and business operation such as water and sewer services.

Private Investment Leveraged. Of the 87 economic development, non-residential infrastructure projects, 34 were initiated with records of commitments for private sector investment. Other projects were initiated with expectation of private sector investment, but no record of a specific amount for it. The records of initial commitments indicate a total \$862 million, of which \$400 million was attributable to one single project (the new BMW plant in South Carolina). Excluding that one project, there was an original commitment for \$462 million of related private sector investment.

Local interviews and data collection conducted for this project showed that these projects actually had an even larger impact on private investment at their sites. This investment included new or renovated buildings and other business facilities. The actual private sector investment associated with (or resulting from) these projects totaled \$3.075 billion, of which nearly half was attributable to the single BMW plant. Excluding that one project, the total actual private investment was \$1.675 billion. Details of the private investment are shown in Table 3.6.

The corresponding level of public funding for these economic development projects, excluding the BMW case, was \$26.4 million of ARC funds and \$101.6 million of total public funds. Thus, there was \$16.65 of private investment for each dollar of total public funding.

It is notable that these private sector leveraging rates vary dramatically among types of projects for at least two reasons. First, because of the nature of various project types there is relatively large variation in the amount of permanent private investment. In some cases, such as business incubator facilities, there is little substantial permanent private investment. On the other hand, there is substantial private investment associated with access roads and most non-residential water/sewer projects. Second, the variation in the maturity and timeline of projects affects the amount of private investment. For example, industrial parks may not yet have moved to full-scale marketing of the facilities.

Project Type	No. of Projects	Project-Related Funding			Total Private Investment Stimulated by Projects
		ARC Funding \$	Total Public Funding \$	Original Private Commitments	
Access Road	15	\$3,425,970	\$10,092,258	\$47,830,080	\$121,400,000
Business Incubator	11	\$2,984,123	\$12,134,768	\$4,255,000	\$81,065,000
Industrial Park	22	\$7,561,457	\$37,749,251	\$220,360,000	\$677,727,000
Water/Sewer-Business	39	\$14,599,922	\$46,961,168	\$589,926,000	\$2,195,350,000
Water/Sewer-Residential	12	\$3,861,575	\$10,210,531	\$0	\$13,100,000
Total	99	\$32,433,047	\$117,147,976	\$862,371,080	\$3,088,642,000
Area Rating (pre-project)					
Distressed	24	\$6,404,885	\$15,708,070	\$10,000,000	\$118,477,000
Transitional	75	\$26,028,162	\$101,439,906	\$852,416,080	\$2,970,165,000
Total	99	\$32,433,047	\$117,147,976	\$862,416,080	\$3,088,642,000
State					
Alabama	12	\$3,042,220	\$17,412,179	\$112,326,000	\$499,985,000
Georgia	8	\$1,450,150	\$4,932,760	\$71,545,000	\$160,000,000
Kentucky	13	\$3,835,265	\$16,063,323	\$2,000,000	\$113,827,000
Maryland	2	\$724,000	\$3,626,100	\$800,000	\$56,000,000
Mississippi	17	\$3,557,290	\$8,426,218	\$9,950,000	\$131,450,000
North Carolina	4	\$680,418	\$2,549,247	\$2,000,000	\$65,700,000
New York	6	\$1,055,000	\$5,630,214	\$1,105,000	\$17,180,000
Ohio	5	\$1,023,657	\$4,431,553	\$33,530,080	\$85,100,000
Pennsylvania	11	\$3,017,321	\$21,027,591	\$188,700,000	\$410,450,000
South Carolina	2	\$2,695,000*	\$7,379,935*	\$420,000,000*	\$1,429,000,000*
Tennessee	6	\$2,081,546	\$2,846,788	\$10,000,000	\$72,050,000
Virginia	5	\$3,010,215	\$7,849,288	\$0	\$6,000,000
West Virginia	8	\$6,260,965	\$14,972,780	\$10,460,000	\$41,900,000
Total	99	\$32,433,047	\$117,147,976	\$862,416,080	\$3,088,642,000

*Each figure for South Carolina includes the following funding for the BMW plant: \$2.195 million ARC, \$6.345 million total public funding, \$400 million of original private commitment for project and \$1.4 billion of total private investment leveraged by the project.

3.6 Effects on Tax Revenues

For a distressed area, the attraction or expansion of business activity can also bring about more tax revenue which can help pay for such things as improvements to local schools and public services. For that reason, there is interest in examining the likely tax impact of these projects.

Tax revenues can be affected by economic development in several distinct ways:

- The additional private investment can lead to increased local property tax revenues;
- The additional wages can lead to additional state income tax revenue;
- The re-spending of wages on consumer purchases can also lead to additional state and local sales tax revenues; and
- The additional business income can lead to additional business income tax revenues.

Additional jobs and population growth can also lead to offset increases in public expenditures for schools, police, fire, and other public services. However, in the case of Appalachian communities with relatively high unemployment, it can be expected that these projects will primarily serve the existing area population and hence have relatively little effect on attraction of new population, though there can be some additional costs of police/fire protection services associated with new or expanded business activity. Such cost impacts are, however, very specific to local situations, and hence are not addressed here.

Results. The estimated project impacts on annual tax collections are as follows:

- state income tax revenue of \$14.3 million (\$12.1 million excluding BMW project);
- state/local sales tax revenue of \$13.9 million (\$11.2 million excluding BMW project); and
- local property tax revenue of \$29.2 million (\$14.6 million excluding BMW project).

A breakdown of the tax revenue impacts by project type, area classification, and state is shown in Table 3.7. The differences among states in sales and income taxes primarily reflect the levels of personal income impact, as well as state differences in average sales and income tax rates. In addition, the differences in property tax impacts reflect the degree of local tax exemption offered as part of the public incentive package to attract some businesses. In some places, some or all of the projects were exempted from local property taxes.

Table 3.7
Additional Tax Revenues Generated

	No. of Projects	State/Local Sales Tax Revenue	Local Property Tax Revenue	State Income Tax Revenue
Project Type				
Access Road	15	1,719,884	1,939,421	1,543,356
Business Incubator	11	3,911,416	415,289	3,744,297
Industrial Park	22	823,864	5,543,353	961,324
Water/Sewer-Business	39	5,874,940	21,189,054	6,669,570
<u>Water/Sewer-Residential</u>	<u>12</u>	<u>1,525,280</u>	<u>70,844</u>	<u>1,380,004</u>
Total	99	\$13,855,384	\$29,157,961	\$14,298,551
Area Rating (pre-project)				
Distressed	24	\$3,165,661	1,309,182	\$2,341,364
<u>Transitional</u>	<u>75</u>	<u>\$10,689,723</u>	<u>27,848,779</u>	<u>\$11,957,187</u>
Total	99	\$13,855,384	\$29,157,961	\$14,298,551
State				
Alabama	12	\$824,426	\$3,085,325	\$880,072
Georgia	8	\$1,719,172	\$199,840	\$1,378,925
Kentucky	13	\$1,536,635	\$350,933	\$1,692,414
Maryland	2	\$134,607	\$0	\$55,558
Mississippi	17	\$2,484,208	\$999,279	\$2,082,959
North Carolina	4	\$599,342	\$415,160	\$109,526
New York	6	\$214,381	\$570,689	\$216,818
Ohio	5	\$4,039	\$1,522,161	\$4,730
Pennsylvania	11	\$3,712,761	\$4,611,640	\$3,809,653
South Carolina	2	\$1,743,301	\$15,575,000	\$3,113,230
Tennessee	6	\$421,840	\$1,068,530	\$419,954
Virginia	5	\$133,420	\$46,100	\$156,263
<u>West Virginia</u>	<u>8</u>	<u>\$327,252</u>	<u>\$713,304</u>	<u>\$378,450</u>
Total	99	\$13,855,384	\$29,157,961	\$14,298,551

3.7 Benefit/Cost Analysis

Measurement Approach. The purpose of ARC project funding for infrastructure and public works projects is to transfer federal funds to targeted local projects, in order to promote improvements to the economic development and quality of life for areas that are considered to be economically depressed (classified as either distressed or transitional). In the parlance of benefit/cost analysis, the focus of this funding is to bring about desired distributional impacts. In this sense, if a business is attracted to invest in and locate activities in a depressed area, then it is a desired benefit even if that business activity was attracted from elsewhere in the United States (presumably in a less depressed area).

Given the desire to attract business activity, “success” can be measured in terms of jobs, income, or private investment. There is no single benefit/cost ratio that is directly applicable. Rather, it is useful to assess the returns on investment for the economic development projects in terms of several measures:

- public cost per job created;
- private sector investment leverage (ratio of private investment per public dollar); and
- personal income created per public dollar spent.

For the residential projects, the primary impacts are the provision of a basic quality of life through access to community water and sewer service, and associated public health improvements. Case studies with local interviews were conducted to assess how the residential public works projects affected the communities, but the results are qualitative rather than quantitative benefit/costs measures.

To assess the impacts associated with economic development (non-residential) projects, two perspectives were used for analysis:

- ARC investments were compared with actual results for the entire project in which the investment was made. This type of ratio is commonly used in program evaluations. But ARC is only one of several public investment sources used in a project financing package. As a result, this type of ratio is accurate only if all of the project results depended exclusively on the ARC funding, and none would have occurred without it.
- To correct for this problem, investment ratios were also developed that compared the total public funding with actual results, and credit is assigned to ARC based on its share of total public investment. This method delivers a much better understanding of actual return on public investment, and eliminates the common problem of “double dipping” among the claims of partnering programs in development projects.

A further discussion of this approach and its differences from other forms of benefit/cost analysis is provided in Appendix C.

Results for Economic Development Projects. The findings on non-residential, economic development project results are summarized in Table 3.8. Three columns of numbers are shown:

- 1) The first column shows the project results in terms of private investment, jobs, and income. Only impacts generated by the 87 economic development projects are shown, so that they can be compared with the public costs for those same projects.

- 2) The second column shows results comparing total impacts with ARC dollars spent. As previously noted, this comparison is most useful if it is assumed that the project results would not occur without the ARC funding.
- 3) The third column shows results comparing total impacts with total public dollars spent. Since the ARC funding is always accompanied by additional public funding for other aspects of the project, the total public dollars are always greater than the ARC dollars alone. The measure of total public dollars combines ARC funds, other federal funds, state funds, and local public funds and treats them all as one package of funding. The resulting ratio thus represents the “average impact” of public funding for these projects. This measure is most useful when it is recognized that the marginal impact of the ARC dollars cannot be accurately distinguished from the marginal impact of other public dollars invested in these projects.

Table 3.8			
Ratio of Total Results per Public Dollar			
for Economic Development (Non-Residential) Projects			
	<u>Project Impact</u>	<u>Ratio per ARC \$</u>	<u>Ratio per Public \$</u>
<i>Total Private Investment</i>	\$ 3.075 billion (\$ 1.675 billion)*	107 : 1 (58 : 1)*	29 : 1 (16 : 1)*
<i>Jobs</i>			
New Jobs: Direct	23,377	\$1,222/job	\$4,574/job
New Jobs: Total	44,331	\$ 645/job	\$2,412/job
Total New + Retained Jobs	60,718	\$ 470/job	\$1,761/job
<i>Income</i>			
From New Jobs: Direct	\$ 577 million	20 to 1	5.4 to 1
From New Jobs: Total	\$ 950 million	33 to 1	8.9 to 1

*The \$1.675 billion reflects the \$3.075 billion total minus the BMW project, which had a disproportionately high level of private investment (\$1.4 billion)

Note: All ratios are based on non-residential project funding: ARC \$28.6 million, total public \$106.9 million; see text for important limitations on interpretations of these ratios.

The results are impressive. Findings are as follows:

- **Total private investment stimulated.** Overall, there was nearly \$29 of private investment per dollar of public investment in economic development projects. Even deleting the single large project, it was \$16. The rate is so high largely because of the nature of the public works projects, in which an access road, sewer line, water line, or industrial park development improvement is made that may attract other businesses to the location.
- **Job creation rate.** Overall, the economic development projects studied here cost \$2,412 per new job created, including indirect and induced job creation. If jobs saved are also counted, then the average cost drops to \$1,761 per job (new and retained).

- **Personal income.** The new jobs led to increased personal income for residents of the affected counties. The ratio was approximately \$9 of *annual* personal income to \$1 of a *one-time* public funding investment for economic development projects.

Table 3.9 shows how the leveraging of public dollars differs among the four types of projects. This is shown first in terms of ratios per ARC investment and second in terms of ratios per total public investment.⁸ Because of the unusually large private investment impact of the Greenville-Spartanburg BMW project on the water and sewer category, the project category is analyzed both with and without investments and impacts related to that single project (#11163). The analysis is useful as a presentation of alternative perspectives on viewing ARC investment impact, not as a comparison of the two sets of figures. In general, it shows that rates of private sector leverage tend to be highest for the water/sewer and industrial park projects. Public costs per job tend to be lowest for water/sewer projects.

	ARC \$ Invested	ARC % of Public \$	Public Dollars per New Job		Public Dollars per New + Retained Job*		Private Dollars per Public Dollar	
			Using ARC \$	Using Total Public \$	Using ARC \$	Using Total Public \$	Using ARC \$	Using Total Public \$
			Access Road	\$3,425,970	34%	\$1,448	\$4,266	\$920
Incubator	\$2,984,123	25%	\$1,344	\$5,466	\$771	\$3,136	\$27.17	\$ 6.68
Industrial Pk.	\$7,561,457	20%	\$1,701	\$8,494	\$945	\$4,720	\$89.63	\$17.95
Water/Sewer	\$14,599,922	31%	\$1,078	\$3,273	\$508	\$1,634	\$150.3	\$46.75
w/o BMW	\$12,404,922	34%	\$1,093	\$3,579	\$725	\$2,374	\$64.12	\$19.58
Non- residential projects	\$28,571,472	27%	\$1,222	\$4,574	\$645	\$2,412	\$107.6	\$28.76
All projects	\$32,422,047	28%	\$1,387	\$5,011	\$731	\$2,643	\$95.23	\$26.37

*retained job totals exclude Hagerstown Technical Innovation Center

Breakdown of Overall Results for All Projects. Table 3.10 differs from the preceding tables in that it shows the ratios of total results for all 99 projects, including the 12 residential projects. Some of the residential projects did leverage private investment, but none of them had immediate measurable impacts on jobs and associated income. Thus, the ratios of overall results shown here indicate slightly lower ratios for private sector leverage and income creation (26:1 instead of 29:1), and slightly higher ratios for cost per job (\$2,643 instead of \$2,412).

The breakdown also reflects differences by project type. Rates of income creation as well as private sector leverage tended to be higher for the water/sewer and industrial park projects, and lower for the business incubator and access road projects. They were also higher for projects in transitional areas and lower for projects in distressed areas.

Table 3.10
Results per Total Public Dollars
for all Economic Development & Residential Projects

	Public \$ per <u>Direct</u> New Jobs	Public \$ per <u>Total</u> New Jobs	<u>Total</u> Income per Public \$	Direct Private Investment per Public \$
Project Type				
Access Road	\$4,266	\$2,711	\$8.45	\$12.03
Business Incubator	\$5,466	\$3,136	\$8.04	\$6.68
Industrial Park	\$8,494	\$4,720	\$4.50	\$17.95
Water/Sewer-Business	\$3,273	\$1,634	\$12.73	\$46.75
Water/Sewer-Residential	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Average	\$5,011	\$2,643	\$8.11	\$26.37
Area Rating (pre-project)				
Distressed	\$8,935	\$6,074	\$3.11	\$7.54
<u>Transitional</u>	<u>\$4,692</u>	<u>\$2,430</u>	<u>\$8.89</u>	<u>\$29.28</u>
Average	\$5,011	\$2,643	\$8.11	\$26.37
State				
Alabama	\$4,496	\$2,501	\$8.43	\$28.71
Georgia	\$1,752	\$1,189	\$15.56	\$32.44
Kentucky	\$9,195	\$6,446	\$2.59	\$7.09
Maryland	\$4,343	\$2,473	\$12.16	\$15.44
Mississippi	\$3,325	\$2,311	\$10.50	\$15.72
North Carolina	\$1,833	\$1,112	\$19.50	\$25.77
New York	\$4,854	\$3,499	\$4.82	\$3.53
Ohio	\$3,383	\$2,111	\$14.24	\$28.68
Pennsylvania	\$17,911	\$10,124	\$1.75	\$19.57
South Carolina	\$2,050	\$599	\$37.18	\$193.63
Tennessee	\$2,109	\$1,458	\$13.55	\$25.31
Virginia	\$27,254	\$15,212	\$1.07	\$0.76
<u>West Virginia</u>	<u>\$11,526</u>	<u>\$5,429</u>	<u>\$3.65</u>	<u>\$2.80</u>
Average	\$5,011	\$2,643	\$8.11	\$26.37

4. Evaluation of Impacts by Project Type

This section provides an analysis of how projected results compare to actual results for the major types of projects: industrial park, business incubator, access roads, and water/sewer service. As noted earlier, the first three categories were considered to be classic economic development projects. Water and sewer projects were divided among economic development and residential development projects, although virtually all residential projects also demonstrate some level of direct or indirect economic development impact.⁹

This section examines the outcomes for the 79 projects classified in the “economic development” category including all industrial park, business incubator, and access road projects, as well as 35 of 51 water and sewer projects. To create a balanced view of ARC investments, the analysis was developed along a dual track:

- First, ARC investments were compared with actual results for the entire project in which the investment was made. This methodology is commonly used in program evaluations, including many at the state and federal level. But each public program investment in development project is commonly only a part of a larger package, thus it is difficult to unambiguously attribute the proper share of the impacts.
- To develop a more accurate view of the specific ARC funding impact, investment ratios were also developed which limited the ARC “share” of a given impact to that portion of public investment provided. This method delivers a much better understanding of actual return on public investment, and eliminates the common problem of “double dipping” among the claims of partnering programs in development projects. This method is referred to as the “ARC Credit” method elsewhere in the report.

Furthermore, this section provides an analysis and examples of qualitative objectives and outcomes of projects that were common among project types. The examples are meant to be illustrative, not exhaustive. These illustrations often relied on the extensive interview process developed with local sponsoring agencies, user firms, and other development or governmental stakeholders involved in the application and implementation process. The interviews “fleshed out” the raw projection and impact on each project, facilitating the identification of common themes among projects.

4.1 Water/Sewer Projects

ARC invested in a variety of water and sewer projects, ranging from water and sewer system development targeted at unserved and underserved residential communities to sewer lines for specific industrial users. In addition, there was a variety of water and sewer improvements designed to impact both business and residential development, including industrial parks.

Fifty-one water and sewer projects (52 percent of the total) accounted for 31 percent of the total ARC investment reflected in the sample. Thus, water and sewer projects tended on average to be smaller than the average sample project.

As Table 4.1 indicates, water and sewer projects performed well, generally meeting or exceeding aggregate projections. Projections for new businesses, jobs, and households served were exceeded at a greater rate than those for service to existing entities, probably because of the open-ended nature of the former. Residential projects exceeded projections for both new and existing households. New businesses were served at almost four times the projected rate, and new jobs were created at a rate about 62 percent over projections.

	Projected	Actual	Actual/Projection
New businesses served	48	191	3.98
Retained businesses served	447	443	0.99
New jobs	8,850	14,347	1.62
Retained jobs	6,504	5,684	0.87
New households served	1,928	4,553	2.36
Existing households served	12,136	13,148	1.08

In addition to these quantitative outcomes, the interviews conducted with economic development officials and various community leaders in each community served by the projects helped identify certain key trends and commonalities among water and sewer projects. Many cases were cited as examples of situations in which water and sewer projects generated other qualitative outcomes not readily measured by the usual performance measurements, including the following:

- facilitated growth and increased commercial activity;
- supported expansion of new and existing industries;
- provided incentives for investment by industries reliant on high-quality water;
- addressed environmental concerns about new development;
- encouraged collaboration between municipalities; and
- provided residential amenities such as convenience, cost savings and community preservation.

Examples of the facilitation of growth and increased commercial activity

- Campbell County, TN: The Careyville/Jacksboro Water Treatment Plant (#10853) brought the wastewater treatment plant of Careyville, TN, into compliance with state and federal standards, spurring the creation of 600 new jobs—a six-fold increase in the town’s employment base. The new jobs have driven a 33 percent increase in the town’s population.
- Greenville-Spartanburg Metro, SC: The largest and most successful project evaluated during the course of this review was the BMW Sewer project (#11163) in Greer, SC, which provided \$2.2 million to support a BMW plant with 1,000 initial jobs.
- Clay County, NC: The Hayesville Water & Sewer Improvements project (#11151), which was intended to support a nursing home, is thought to have led to the development of a strip mall and auto-related uses on greenfield sites on the outskirts of town. (Local observers also consider this project to be responsible for high vacancy rates and disinvestment downtown.)
- The Jellico Inflow/Infiltration project (#11098) resolved sewage backup problems in the ailing downtown area, thereby attracting new business and jobs downtown.

Examples of support for expansion of new and existing industries. These projects provided for communities that were previously unable to get fire insurance because of incapacity for sprinkler systems.

- Winston County, AL: The Arley Water System improvement project (#10489) enabled the expansion of three existing furniture makers from a total of 175 to 600 employees; these firms were previously unable to grow due to insurance problems.
- Pontotoc, MS: Similarly, the Ecrú Industrial Park project (#10901) funded water mains needed for industrial sprinkler systems, enabling the creation of 137 blue-collar jobs paying an average of \$11.50 an hour.

Examples of incentives for investment by industries reliant on high-quality water

- Winston County, MS: The Noxapater Water Improvements project (#10904) retained and expanded a manufacturer of white industrial gloves used in auto spray painting. The factory had been planning to relocate because rust in the local water supply (from old galvanized pipes) was discoloring their product. Seventy new and retained jobs were secured by the project.
- Polk County, TN: The Benton Water System improvement project (#11080) improved water quality by replacing old metal lines, resulting in the attraction of five new businesses with 100 jobs to Benton, TN. The new businesses included a French company that bottles local water for sale to upscale markets. The project also allowed the local utility to expand their services to adjacent areas, providing additional revenues that result in cost savings for customers within the service area.
- Marion County, TN: Local economic development officials in Jasper, TN doubled the size of an ARC-funded water storage tank (#11082) from 25,000 to 50,000 gallons, and secured an additional \$35,000 from an abutting town. This allowed the town of Jasper to attract new industries with 385 new jobs, far exceeding the initial target of 100 jobs.

Examples of projects that addressed environmental issues related to new development.

These projects allowed communities to grow for the first time in many years.

- Powell County, KY: The Clay City, KY Wastewater Treatment project (#11091) removed a moratorium on development imposed because of environmental violations. Fifty new houses have been built.
- Boyd County, KY: The Boyd County Rural Sanitary Sewer System project (#11204) lifted an embargo on development resulting from restrictions on new package sewer plants in an unincorporated area west of Ashland, KY. This project enabled over \$35 million in new investment and 950 new jobs. A new 2,000-acre regional industrial park is now being developed in Ashland.
- Putnam County, WV: The Winfield, WV Sewer Extension project (#11013), which supported 110 service-sector jobs, also sparked the development of 150 new houses, resulting in the first increase in the population of this rural West Virginia community's population in over 30 years. The project has boosted property values and local taxes, supporting better schools and public services. The area is now one of the fastest-growing corridors in the country and Toyota is planning to locate a new production facility in the vicinity.

Examples of projects that encouraged collaboration between municipalities. Many of these projects resulted in regionalization of public water and sewer, achieving cost savings and operational efficiencies.

- Powell County, KY: The Powell County Water Treatment Plant (#10845) resulted in the regionalization of three local sewer districts in Eastern Kentucky. The project represented a major step forward in achieving economies of scale in delivery of public services in the region.
- Winston County, MS: The Noxapater Water Improvements project (#10904) resulted in the merger of the Choctaw, MS Water Association and another local water association to achieve greater economies of scale in development of a new treatment plant.

Projects that fostered confidence in distressed communities. ARC support of water supply and sewer improvements fostered confidence in distressed communities, which led to new investment in residential development, increased property values, and, in many cases, development of new businesses.

- Bibb County, AL: The Harrisburg Water System improvements project (#10756) provided a water storage tank to a threatened community in Alabama's "tornado alley" leading to the development of new housing.
- Blount/St. Clair Counties, AL: The Blount Mountain Water Extension project (#10817) has resulted in a 30 percent increase in the population of Oneonta, AL.
- Pulaski County, KY: The Nelson Valley Water System Extension project (#11142) sparked development of 125 new houses in this distressed Kentucky community, where the population has begun to increase for the first time in 30 years.
- Dickenson, VA: The Clintwood/Skeetrock water project (#11165) has encouraged investment in permanent, stick-built housing in a distressed Virginia community, reversing a 30-year population decline.
- Lincoln County, KY: The Crab Orchard Water & Sewer Project (#11169) spurred development of 26 new homes in this Western Kentucky community. A \$1 million retail development is planned which will be the first of its kind in the town.

Examples of projects that provided residential amenities such as convenience, cost savings and community preservation. In distressed community projects, including several discussed here, water and sewer projects are not required to directly generate business investment and jobs.

- Blount/St. Clair Counties, AL: The Blount Mountain Water Extension Project (#10817) provided public water service to 180 customers in Oneonta, AL, who previously had to haul water as they could not afford expensive filtration systems.
- Choctaw County, MS: The Choctaw Water Improvements project (#10902) provided a reliable supply of water to residents of Ackerman, MS, where the unreliable water supply created hardship for residents, making simple household tasks tedious and leaving many households without water during peak times.
- Roane County, WV: The Long Ridge Water Project (#11148) provided water and sewer service to 55 customers in Walton, WV, where wells had dried up because of depletion of the aquifer, which was caused by extensive drilling for oil and gas.
- Dickenson County, VA: The ARC grant for the Clinton/Skeetrock water project (#11165) has reduced the water bill of low income residents in the isolated Skeetrock community to an affordable \$25 to \$30 a month.
- Rockcastle County, KY: ARC support of the Rockcastle Waterline Extension (#11200) helped to keep water service affordable for residents of two rural Kentucky communities, many of whom were paying up to \$100 a month to get water hauled. Local observers say that the affordable water supply has helped to promote a higher level of household and personal hygiene.
- Wayne County, WV: The Kenova, WV Buffalo Creek Water Extension project (#12128) has allowed 200 households to wash laundry at home that previously had to use laundromats.
- Jefferson, AL (non-distressed) King Point Water Line Extension (#10988): ARC investment enabled a \$100 million private investment in a new coal mine and provided public water to the community's 200 households, many of whom previously had to haul water because wells were contaminated with mud and iron.
- Jackson County, GA (non-distressed): The Braselton Wastewater Improvements project (#10839) generated 1,387 jobs in this Georgia community for people in the local area who were previously faced with commutes of up to three hours a day.

4.2 Industrial Park Projects

Depending on the needs of a specific project, ARC industrial park investments will cover almost any aspect of site development, utility infrastructure, paving or building construction, or rehabilitation for multiple users.

Twenty-two industrial park projects (22 percent of the total) accounted for 17 percent of the total ARC investment reflected in the sample. Thus, industrial park project grants tended to be smaller than the average sample project.

	Projected	Actual	Actual/Projection
New businesses served	53	83	1.57
Retained businesses served	69	69	1.00
New jobs	4,434	4,444	1.00
Retained jobs	1,395	1,272	0.91
Existing households served	910	1,310	1.44

As Table 4.2 indicates, industrial park projects performed well, generally meeting or exceeding aggregate projections. Projections for new businesses, jobs and households served were exceeded at a greater rate than those for service to existing business and jobs, probably because of the open-ended nature of the former. Infrastructure for at least one industrial park project even managed to serve a number of households. New businesses were served at a rate about 57 percent above projections. While most projections were “only” met, it is important to emphasize the relatively short “on-line” period of several parks in the sample projects and the extensive marketing period usually needed for such developments, especially outside “hot” development areas. Five of the projects applied after 1993, with online marketing for most beginning two to three years later.

In addition to these quantitative outcomes, the interviews conducted with economic development officials and various community leaders in each community served by the projects helped identify certain key trends and commonalities among industrial park projects. Many cases were cited as examples where industrial park projects generated other qualitative outcomes not readily measured by the usual performance measurements, including:

- Provided opportunities for workers with modest as well as higher skills;
- Provided high job outputs in high-growth sectors;
- Stimulated cluster development impacts; and
- Stimulated brownfields' reuse and development.

ARC's industrial park projects supporting opportunities for workers with modest as well as higher skills.

- Madison County, AL: In Huntsville, AL, the Industrial Park Infrastructure project (#9994) produced 650 blue-collar jobs in an area where jobs for highly skilled engineers were growing but few opportunities had been available for less skilled blue-collar workers.
- Marion County, WV: In contrast, the West Virginia Hi-Tech Consortium Incubator Project (#11493) has supported 310 jobs that have gone to highly skilled, mainly non-local people. Although the indirect benefits of increased jobs and income in the community have trickled down through the service sector, there is still high structural unemployment among blue-collar workers.

Industrial park projects strategically located within high growth corridors that produced more jobs than expected.

- Lumpkin County, GA: The Lumpkin County Industrial Park (#11028) in the high growth Georgia 400 corridor has produced 600 new jobs, far exceeding projections of 75 jobs.
- Muskingum County, OH: The East Muskingham Water System Improvements (#11092) for the Zanesville, OH, Airport Distribution Park unleashed development potential for this fast-growing area. Although only five jobs were projected, the project supported the recruitment of four new businesses with 306 jobs.
- Mercer County, WV: The Gardner Industrial Turnpike project (#10998) provided water and sewer service to a rapidly developing area that has become a locus for institutional uses. To date, 220 jobs have been created in this area, exceeding projections of 150 jobs by almost 50 percent.

4.3 Business Incubator Projects

ARC investments in business incubators primarily include the development of buildings suitable for multi-enterprise business start-up purposes.¹⁰ Eleven business incubator projects (11 percent of the total) accounted for 26 percent of the total ARC investment reflected in the database. Thus, business incubator project grants tended to be larger than the average sample project.

As Table 4.3 indicates, incubator projects performed well, meeting or exceeding aggregate projections in every case, even when adjusted for very high retention estimates of one incubator. Because incubators do not traditionally require or expect permanent private investment, impacts were not calculated for this category. It is noteworthy, however, that actual results exceeded projections in every other category. Actual results for new businesses ran more than three times projections. Retained businesses served were double the projection—and were much higher when the results of the Hagerstown Technical Innovation Center (TIC) were included. New jobs created with the investment numbered almost five times projections, and retained jobs numbered 50 percent over projections, even without including TIC totals.

	Projected	Actual	Actual/Projection
New businesses served	34	111	3.26
* Retained businesses served	2	104	52.00
Excluding Hagerstown TIC	2	4	2.00
New jobs	458	2,220	4.85
* Retained jobs	92	8,338	90.63
Excluding Hagerstown TIC	92	138	1.50
New households served	0	0	N/A
Existing households served	0	0	N/A
*Hagerstown TIC totals include non-tenant technical assistance N/A = not applicable			

The entrepreneurial vitality analysis in Table 4.4 suggests overwhelmingly that ARC's focus on entrepreneurship is right on the mark, since the Region fares poorly in start-up activity measures relative to U.S. patterns. Notably, start-up activity and performance appear slightly better, on the whole, among project areas that developed incubator projects.

		U.S.=100	
State	County	Start-up Rate	Start-up Survival
AL	Jefferson	120	98
MD	Allegany	75	116
MD	Washington	88	105
MS	Itawamba	79	87
NY	Cattaraugus	62	102
NY	Chautauqua	54	119
NY	Cortland	78	109
PA	Erie (2)	62	111
PA	McKean	60	125
WV	Marion	90	97
Sample Average		77	101

Five of the ten incubator counties had higher start-up activity rates than the sample average, and seven of ten had higher-than-average start-up survival rates. Notably, the same five counties (representing six of the eleven incubator projects) were located in a low-start-up area of the Region that includes southern New York and the northern tier of Pennsylvania. A sixth county in the corridor, Cortland, New York, barely topped the sample average for start-up activity with a 78 rating compared with the average of 77. The identification of need in these areas is extremely well deserved. But overall, the sample incubator projects were concentrated in a handful of states and far behind what the vitality indices indicate is needed. A larger or different sample of incubator projects from the 29 in ARC's files (of which 18 were closed and 11 selected for this study) may have yielded different conclusions.

In addition to these quantitative outcomes, the interviews conducted with economic development officials and various community leaders in each community served by the projects helped identify certain key trends and commonalities among business incubator projects. Several cases were cited as examples where business incubator projects generated other qualitative outcomes not readily measured by the usual performance measurements, including the following:

- Generated higher graduation rates, yielding higher job creation;
- Played a vital work force development role—not just a home for start-ups; and

- Provided technology and intensive services that paid off.

Incubator projects providing technology-intensive and deep technical assistance services

- Washington County, MD: The Hagerstown Technical Innovation Center (#11000) has provided technical support that has generated an estimated \$55 million investment in advanced equipment and plant among the region's manufacturing sector. Officials claimed to have generated over 8,000 new jobs in this rapidly growing county.
- The Birmingham BEC (#10751) has created an unusually deep role for itself in addition to traditional incubator services, including the formation of mentor groups and boards, web site design for tenants, and pursuit of and connection to venture capital investors.

Incubator projects that serve as a vital training resource for local people

- Training and placement have been provided for 260 disabled people in the J.M. Murray Center Incubator (#99991).
- Chautauqua County, NY: Tenants of the Riverside Industrial Center (#11158) in Jamestown, NY, have partnered with the Department of Labor, which provides training grants for metal workers in support of the center's tenants.
- Erie County, PA: The Uniflow incubator (#11692) has focused on work-force development. There are now just 40 jobs there but over 150 workers have been trained by minority-owned firms with the express purpose of moving employees on to better jobs. In addition, the incubator is home to the county's workforce development consortium.

Higher graduation rates yielded higher job creation: Incubator projects with high tenant-graduation rates appeared to support more long-term jobs than incubators with long-term tenants. As successful tenants are launched from projects with high turnover, incubator premises can be recycled to other small firms that will follow suit.

- The J.M. Murray Center in Cortland, NY (#12232) has launched eight successful businesses that provide a total of 260 jobs, including one very successful mobile bus-fleet-washing operation.
- Jefferson County, AL: The Birmingham Assistance Network (#10751) has nurtured 25 growing firms that have spawned 250 jobs in the city.

4.4 Access Road Projects

Access road projects funded a variety of paving efforts, including access to specific industrial user sites, access to multi-user industrial parks, and connector roads, sometimes between towns, which opened up new commercial land use. Fifteen projects (15 percent of the total) accounted for 34 percent of the total ARC investment reflected in the sample. Thus, industrial access road project grants tended to larger than the average sample project.

	Projected	Actual	Actual/Projection
New businesses served	7	30	4.29
Retained businesses served	13	10	0.77
New jobs	1,942	2,366	1.22
Retained jobs	232	1,093	4.71
Existing households served	30	30	1.00

As Table 4.5 suggests, industrial access road projects performed well, meeting or exceeding aggregate projections. New businesses were served at a rate more than four times projections, while retained businesses projected exceeded the actual number surviving and served. However, both new and retained jobs assisted by the projects came in far above projections.

As detailed in section 4 of this report, ARC investments in access road projects paid off with very significant leveraging rates not attained by other development classifications. Specific road access projects for industrial parks had a particularly high rate of job creation per dollar spent.

Access roads with high payoffs

- Clermont County, OH: ARC's investment in an access road improvement project (#8851) for the Clermont County Industrial Park in Miami, OH, produced 1,120 jobs and investment of \$37 million, a rate of about \$267 per job, or \$1,408 per job using the "ARC Credit" method (see pages 29-31). This investment leveraged a \$37 million private investment that created 300 new jobs and retained another 820 jobs.
- Lee County, MS: ARC's contribution to the project to widen Eason Blvd. in the same county (#10937) generated 450 new jobs in Tupelo, MS, a rate of \$444 per job or \$905 per job using the average job-per-public-dollar method. The Turner Industrial Park Access Road project (#10934) catalyzed 600 new jobs paying an average of \$25,000 a year. This computes to a rate of \$850 per job or \$1,512 per job using the "ARC Credit" method.

5. Localized Project Impacts

This section first examines the economic diversification effects of the projects on the counties' industry and employment mix. Most of these projects involved some form of manufacturing diversification, although a number of projects involved tourism and prison development. In addition, this section examines the effects of projects in distressed counties and attempts to identify cases in which projects may have contributed to tangible progress in distressed counties. Finally, a framework is developed to examine the other qualitative objectives that these projects had on the local economies, including:

- **Reuse of vacant or underutilized sites**, including abandoned industrial and commercial sites in areas ranging from traditional rural manufacturing centers to urban downtowns;
- **Support for existing business opportunities**, including bird-in-hand and speculative development investments;
- **Strategic investments**, including projects designed to carry out larger regional visions or to nurture strategic industry clusters;
- **Support for traditional industries** that continue to be the mainstay of many project counties;
- **Mitigation of environmental problems**, largely in rural communities; and
- **Other quality-of-life factors**, including work force development opportunities, public health, and education.

5.1 Economic Diversification

Economic diversification is a key objective of the Commission because increasing the number of industries in a local economy helps stimulate overall growth and decrease over dependence on any one sector. To assess progress in project areas, a diversification analysis was performed for each project location.

In order to examine the differences in a county's industry mix relative to the rest of the nation, industrial "location quotients" were computed to show the concentration of establishments or employment in a particular industry of the county relative to the rest of the nation. If a particular industry accounts for a larger share of the county's employment than that industry accounts for nationally, the location quotient will be greater than 1. If the industry accounts for less of the county's employment than it does nationally, it will be less than 1. This analysis provides a view of a county's economic specialization within a given industry and the *change* in economic specialization over time. Moreover, a county's industry specialization can be examined in relation to national industrial trends

to determine if the industry in question is expanding or declining in employment and output.¹¹

It is a matter of debate whether a well-diversified or balanced industry mix is necessarily a good thing. Indeed, many economic developers would suggest that heavier concentrations of high value-added jobs in manufacturing and in the so-called “traded services” are desirable. Nonetheless, reliance on a particular industry does make a county vulnerable to sudden or long-term changes in demand for the industry’s product. Thus, the results of this diversification analysis must be understood within this broader context and limitations, and, most important, within the local context of each project area.

Counties covered by this project evaluation provide an array of examples, both dependent and diversified. In some (Buchanan, VA, at 74.74; Dickenson, VA, at 52.81), mining concentrations reflected overwhelming dependence on traditional extractive industries at the beginning of the measurement process (1990). In Dickenson, mining concentration was cut by more than 40 percent by 1996, while manufacturing, retail, and services employment all increased, largely as a result of ARC investment. Other economies, such as Cattaraugus County, NY, began and ended the measurement period with more balance among sectors, despite relatively high concentrations in manufacturing, transportation, and, less so, mining.

Diversification Effects by Major Sectors

Mining. Eighteen project areas began the 1990 analysis with mining employment concentrations at least double the U.S. average (2.00). By 1996, eleven of these (61 percent) had reduced mining concentrations, nine of them significantly. (Dickenson concentrations were down to about 31.) Three of the original 18 (Muskingum, OH; Cambria, PA; Campbell, TN) lowered mining employment concentrations below the 2.00 threshold. Since five of the original 18 could not be measured in 1996 because of confidentiality restrictions imposed by the U.S. Bureau of Census, the actual results are likely somewhat more impressive. Interestingly, 13 of the 18 diversified into increased manufacturing during the same period—but only one above 2.00. Because of the nature of mining operations, this trend toward decreased mining dependence may be seen as an inevitable and largely positive long-term phenomenon, despite short- to mid-term dislocations, the effects of which should not be minimized.¹²

Despite the general trend away from mining, one project used ARC resources to increase reliance on mining. In Jefferson, AL, ARC investment enabled a \$100 million private investment in a new coal mine that created 822 jobs for miners paying annual wages of \$36,000 to \$45,000 (King Point Water Line Extension in Jefferson County, AL; #10988). The project also provided public water to the community’s 200 households, many of whom previously had to haul water because wells were contaminated with mud and iron.

Manufacturing. Twenty-five projects areas (county or multi-county areas) registered manufacturing concentrations of 2.00 or greater in 1990. Only 12—a much smaller percentage than in mining—lowered manufacturing concentrations by 1996. Nonetheless, diversification *within* the manufacturing sector did take place in a number of areas (projects in Harrison County, WV, and Johnson County, TN, provide two examples discussed in more depth elsewhere in the report).

The project sample reflects a general trend of high growth during the 1990-96 period often found in areas with high manufacturing concentrations. Indeed, job growth exceeded national patterns in 56 percent of all project areas, with 14 of the initial 25 project areas with high manufacturing concentrations (also 56 percent) exhibiting higher aggregate rates for all sectors than the U.S. average. However, eight of thirteen areas (62 percent) did not decrease manufacturing concentrations. For the 56 project areas that had above-average manufacturing concentrations in 1990, 33 (59 percent) showed average or higher overall growth during the six-year measurement period. Not a single project area which began with higher-than-average manufacturing concentrations ended with lower-than-average levels.¹³

Nineteen project areas registered lower-than-average manufacturing concentrations in 1990. Of these, only nine (48 percent) exceeded national job growth averages. And of the sixteen project areas which began and ended with below-average manufacturing concentrations, only seven (44 percent) reflected higher-than-average growth in aggregate for all sectors. In both cases, two of the high overall job-growth scorers also moved from below-average to higher-than-average manufacturing concentrations.

The high concentration of manufacturing jobs among ARC investment projects has contributed to significant growth in the manufacturing sectors of many project counties during the 1990-1996 period. Nonetheless, because of the variations in the industrial gains and losses that comprise total growth figures in each county, it is not possible to quantify growth in absolute terms, but it is possible to calculate the “project jobs” relative to overall growth patterns in each county in the 1990-96 period. The results are nothing short of impressive, as discussed earlier in this chapter.

Service Sectors. Only eight project areas showed higher-than-average service-sector concentrations. In seven of these, higher-than-average concentrations are the result of sector growth since 1990. In the same period, service concentrations have increased in only 43 areas despite the national explosion of firms and jobs in this sector. These findings suggest the need for increased analysis and attention to development of traded services.

Retail. Forty of the seventy-six project areas showed average or higher retail concentrations in 1990; 45 were at or above national average concentrations by 1996. It is clear from interviews, as well as some individual growth patterns, that some ARC

projects helped stimulate significant retail growth, moving some areas into positions as regional retail centers (Cattaraugus, NY; Campbell, TN; Rowan, KY; Cherokee, SC).

Finance, Insurance and Real Estate. Only five project areas showed concentrations in finance, insurance and real estate sectors at higher-than-average levels in 1990. Only six (8 percent) did by 1996. Two areas dropped out of high concentration classifications, and three entered. While an analysis of financial gaps is beyond the scope of this project, these figures indicate that easy access to capital and financial services may be a concern in many areas of the Region.

In general, the diversification analysis of these sample projects indicates that ARC-funded projects clearly assisted counties in diversifying their economies. County-level diversification often reflected a perceived need to move away from high levels of dependence on (and decline of) traditional industries, most often in mining, textiles and low value-added wood products. In other situations (Cherokee, SC, and Powell, KY are highlighted below), development efforts created entirely new economic environments for rural counties and, in the case of Cherokee, a regional retail center.

In most situations, ARC investments focused on value-added manufacturing growth. While these investments fell within already high manufacturing concentrations in many areas, they rarely added to industries on which counties were already highly reliant. Rather, ARC investments spawned new industrial firms and clusters (aerospace in West Virginia, auto in South Carolina, fabricated metals in Tennessee and others), aiding stabilization efforts within the high-value, high-multiplier manufacturing sector. In almost every case, industrial park and business incubator development created the conditions for a wide variety of new and expanding firms to thrive in several different industries.

Business incubators, water projects that opened new residential areas, and some industrial projects played an ongoing role in community diversification efforts. Cambria County, PA, for example, unexpectedly became home to multiple, large service-sector operations. Medical and high-value service businesses—industries new to the area—were nurtured in the Birmingham incubator. Rural Virginia counties (see below) were suddenly found attractive by telemarketing and other service firms. In addition to those summarized in the highlight boxes, other projects were clearly and successfully designed to make diversification inroads on the economic development map of their areas.

In sum, the project sample clearly reflected successful efforts to move local economies in the Region away from traditional reliance on often declining industries and into new, high-value areas. Most often this move occurred within the manufacturing environment. But, as a review of the project profiles suggests, a substantial number brought new retail and, in some cases, value-added service vitality to ARC counties.

Diversification examples

- Powell County, KY: The Powell County Water Treatment plant (#10845) helped three small rural Kentucky farming communities make a transition from dependence on farming to new roles as bedroom suburbs for the rapidly growing West Point metro area.
- Steuben County, NY: The Hornell Commercial Center project (#11155) funded a sewer extension in support of a major regional mall in upstate New York. The project brought 600 new jobs, which helped to compensate for employment losses in glass manufacturing. The mall and the related commercial and leisure development that the project has generated have made Steuben a regional commercial center. Local observers believe that the project gave the city the competitive advantage necessary to subsequently attract a major high-tech manufacturing operation from France.
- Cattaraugus County, NY (#10621): Access road investment by the ARC helped build this area's role as a regional commercial center (see discussion in the site visit in Appendix A).
- Cherokee, SC: Carolina Outlets Infrastructure project (#12414) supported a large and growing factory outlet development with 600 to 700 jobs, which added a regional retail pull to the town of Gaffney (see the site visit write-up).
- Johnson County, TN: The N.N. Ball & Roller Company project (#12372) supported a metal fabrication operation that helped to diversify the economy of Mountain City away from dependence on textiles and wood. The new jobs that resulted from the project offer wages 20 to 25 percent higher than those paid by the traditional industries. The project also established a toehold in metal fabrication, which has been followed by marketing efforts focused on attracting related industries.
- Lee County, MS: ARC-funded improvements to Eason Blvd (#10937) supported a hospital expansion that created 300 new jobs in healthcare, a rapidly developing industry in Tupelo, MS.

With the help of ARC-funded projects, other areas have similarly established themselves in new industries, which have in turn helped to leverage investment in similar operations.

Other diversification examples

- Dickenson County, VA: The Dickenson County Industrial Development project (#10929) supported a Nexus call center, which will employ 550 people within three years. This helped Virginia's Cumberland Plateau Local Development District to attract three other large call centers with a total of 400 jobs. Training grants of over \$500,000 have been leveraged to train former manual workers in telephone communication and computer skills and to establish the region as a center of excellence for labor-intensive telecommunications industries.
- Buchanan County, VA: The ARC's support for infrastructure at the Slate Creek industrial site (#11166) helped Grundy, a Virginia coal mining closure community, to recruit two new call centers—an airline reservation office and a market research operation—with a total of 165 new jobs. This support has helped Buchanan County attract additional call centers in other locations.
- Diversification away from textiles is also evident in the effects of the BMW project (#11163) in the Greenville-Spartanburg metropolitan statistical area, which has spurred ongoing attraction of foreign-owned firms (as detailed in the site visit in Appendix A). The area has exhibited very strong growth patterns largely because of in-migration and the location of large new plant sites. This induced growth will most likely stimulate other entrepreneurial activities and help diversify the economy.
- Harrison County, WV (#10381): ARC investment has helped transform a sleepy rural airport into a dynamic center for aerospace maintenance, overhaul, and conversion, as detailed in the site visit write-ups.

In addition, two recurring trends in diversification efforts are worth noting: tourism and prison development.

Tourism Development

In the southern parts of the Appalachian Region, tourism has provided a key means of economic restructuring from agriculture and heavy manufacturing into growth tourism and related service industries. Wastewater system improvements have supported major tourist developments, as shown by the highlighted cases.

Tourism diversification

- Jackson, GA: The Braselton Wastewater project (#10839) enabled the location of a major resort developed around the Chateau Elan Winery and restaurant. The project also supported two manufacturing firms which have provided a combined total of 1,265 new jobs, more than offsetting losses resulting from the contraction and then closure of a Mitsubishi plant.
- Towns County, GA: The Young Harris Wastewater System Improvements project (#11043) supported the Brasstown development, a privately run resort at a new state park with 200 jobs. Development also facilitated the construction of seasonal, upscale housing. The Hiwassee Sewer System Improvements Project (#11027) supported the development of the Chatuge resort with 75 jobs at the site of Georgia's Mountain State Fair in Towns County, replacing jobs lost in the textiles industry.
- Winston County, AL: The Arley Water System Improvements (#10489) enabled the expansion of three existing furniture manufacturers, adding 425 manufacturing jobs. This project also spurred development of new lakeside seasonal housing, which has increased the population by 25 percent during the winter months.
- Pulaski, KY: The Garland Road Water Line Extension (#11170) was designed to serve 171 new households, but has also been a key factor in sparking a \$6 million investment toward the development of a new resort complex with almost 200 additional part-time dwellings and demand for related services.
- Tourism has also increased as an offshoot of other projects, including the retail project in Cherokee, SC, and road improvements for a furniture mart in Tupelo, MS (#11102).

Prison Development

Projects that have supported new prisons have produced numerous good-paying jobs, often with significant local spin off to other businesses in the community. Depending on levels of outsourcing, prisons often have high local job multipliers because they are large consumers of goods and services such as food, laundry, maintenance, health care, and insurance.

Prison development

- Belmont County, OH: The Fox-Shannon Industrial Park Improvements project (#10574) in Belmont, OH, funded a road originally designed for a UPS facility with 34 jobs. When the opportunity to compete for a new state prison presented itself, however, local officials entered a successful bid for the prison, using the site, which has generated 500 high-paying jobs, principally for blue-collar workers.
- McDowell County, NC: The McDowell County Water and Sewer project (#10882) helped to attract a prison with 435 direct jobs, which have induced another 300 jobs in the local area.
- Habersham County, GA: The Demorest Water System improvements (#10842) enabled the expansion of a state prison in Habersham County, providing 200 jobs paying \$15.00 to \$20.00 an hour. The increased employment from the prison and a paper mill (which was able to expand because of the project) is believed by local observers to have also spurred the development of 150 new houses in the community.
- In Forest County, PA (#10392) a sewer line extension made possible the planned development of a state prison which will provide numerous good-paying jobs in the area.

5.2 Distressed Community Impacts

To discover the trends within both the sampled and unsampled distressed counties an analysis traced the progress of the most distressed ARC counties in both groups. Of the 90 ARC counties that were in the distressed category in 1988, 22 (24 percent) moved up to the transitional category by FY2000.¹⁴ Among the project counties, 18 were distressed in 1988, approximately the same proportion as of all ARC counties. While a direct causal relationship should not be imputed, the sampled distressed project counties clearly improved at a greater rate than did unsampled distressed counties.

Another analysis traced the progress of ARC counties that were deemed transitional in FY1988 in both the sampled and unsampled groups. Of the 289 ARC counties that were in the transitional category in 1988, 39 (13 percent) dropped to distressed, 232 (80 percent) remained transitional, 14 (5 percent) moved into competitive, and 4 (1 percent) moved to attainment rankings by FY2000.¹⁵

Among the sampled counties, 58 were transitional in 1988. By FY2000, 8 of these had dropped to distressed, 44 maintained transitional rankings, and 6 improved their ratings to competitive. The overall rate of the sampled group decreased from 2.00 to 1.97. While

the sampled group declined overall, the drop was slightly less than the decline identified among the all-ARC group of transitional counties.

In the case of counties starting out as either distressed or transitional, it's worth stressing that no causal relationship can be ascertained.¹⁶ An analysis of the projects in counties that moved from "distressed" to "transitional" designations suggests, however, that project investments in several of these progressing counties were significant contributing factors in elevating county status. In at least four cases, demonstrable impacts included the retention or creation of 5 percent of the total number of jobs in these counties.

Project counties moving from distressed status to transitional status

- Bibb County, AL (#10756): ARC funding went toward a water project that did not directly bear on the economy but contributed to a renewed sense of optimism regarding the community's future. The project served 295 households, including 20 new homes.
- Pulaski County, KY (#11142/#11170): Funding covered two water supply projects that improved life for more than 500 homes and spurred the development of 40 new homes—and also assisted in the creation of a resort community now under development.
- Grainger County, TN (#11083): This water filtration project serviced existing residential communities and also facilitated substantial new housing development and 58 businesses. New businesses have been attracted to the community since the project was funded. The project accounted for 185 new jobs and 685 retained jobs; the county supports about 2,500 jobs in total.
- Marion County, TN (#11082): This multi-faceted infrastructure project satisfied key demands of an incoming metals manufacturer. The project (including the location of other businesses) has resulted in almost 400 jobs—almost 7 percent of the total number of jobs in this small county.
- Polk County, TN (#11080): Water system improvements resulted in the location of five new businesses and almost 100 new residential units in the area. One hundred new jobs were created and 300 retained in this county, which supports only about 2,400 jobs in total.
- Wayne County, WV (#12128): A recently completed water pipeline project brought service to more than 200 homes in a community with many contaminated wells. This project brought this community in line with the progress that had been experienced in the rest of the county.

Other counties moved from transitional to competitive rankings with the aid of ARC investment projects:

Projects in transitional counties that moved to competitive status

- Madison County, AL (#9994): This infrastructure project was a key element in the creation of a supplier-focused industrial park, which has created 650 jobs in the county since 1988. This is a significant development despite the relatively modest scale of impact (direct jobs account for 3.2 percent of net job growth in 1990-96, and total jobs created by the project account for 6.4 percent) in this county of 102,000 jobs.
- Habersham County, GA (#10800): The water extension project facilitated service to both business and residential communities. It resulted in 465 new jobs and 65 retained jobs (only the retained jobs were originally anticipated). Direct job creation and retention resulting from the project accounted for 28.4 percent of the county's net growth from 1990 to 1996.
- Buncombe County, NC (#11376): Extension of water and sewer lines to an industrial park has resulted in the creation of 420 new jobs. These and indirect jobs created by the project accounted for more than 9.9 percent of the net job growth in the county from 1990 to 1996.
- Clermont County, OH (#8851): This access road project has opened up new commercial areas, facilitating the creation of 300 jobs and the retention of more than 800—about 2.4 percent of total county net job creation in 1990-96.
- Spartanburg County, SC (#11163): This sewage treatment project was instrumental in the development of a BMW plant, which has created 3,000 jobs in the metropolitan county of 104,000 total employment. Direct employment accounted for 8.9 percent of total net job growth in the bi-county area in 1990-96, while direct and indirect jobs created account for a whopping 34.5 percent.
- Putnam County, WV (#11013): This sewer project unexpectedly sparked the development of 150 new homes and 60 new jobs, as well as 50 retained jobs, in this county of about 13,000 total jobs. Project impacts (accounting for 1.6 per cent of total net job growth 1990-96) were but one factor in a growth explosion that witnessed a 65 percent increase in county jobs between 1990 and 1995.

5.3 Site and Facility Reuse

For many traditional manufacturing areas, particularly those concentrated in the northeast areas of the Region, project priorities include the cleanup of abandoned industrial property and often-contaminated brownfield sites. ARC-investments supported the recycling of several industrial sites, often providing high-quality blue-collar jobs in industries new to their areas and often for dislocated workers.

In general, these projects put back into productive use sites that had been symbols of community blight for long periods, a value difficult to reflect in “jobs created” or “businesses served” measures.

Site reuse examples

- The Aliquippa Industrial Park project (#11679), on the former site of LTV’s Aliquippa Steel Works, has attracted a gypsum plant with 190 jobs paying \$25,000 a year.
- Erie, PA’s Veschecco Industrial Park (#11692) is a recognized national leader in brownfield development and the attraction of suburban industries back to the city. The Uniflow Incubator in Erie has concentrated on nurturing firms and agencies focused on workforce development issues.
- Rehabilitation and productive value-added reuse of aging industrial buildings are evident at several ARC investment sites in Pennsylvania, including the Mifflin County business park, the Bradford (McKean County) Multi-Tenant Complex (#10828), and the Franklin Area Industrial Complex in Venango County (#10865).

In several instances, incubator projects involving the refurbishment of existing buildings in blighted downtown areas have sparked area renewal. A few cases are highlighted below as illustrations of the qualitative benefits generated by incubators.

Incubators revitalizing urban centers

- The J.M. Murray Center (#99991) improved the area around a formerly vacant building in Cortland, NY.
- In Cattaraugus County, NY, an ARC-funded incubator project (#10564) was located in a previously abandoned area. The refurbished building contributed to the revitalization of the area, which has enjoyed a renaissance and vast increase in land values since the project was completed.
- The Birmingham Assistance Network Project in Jefferson County, AL (#10751) renovated a vacant downtown retail building as an incubator for service and light-manufacturing firms; this project is leading a revitalization effort in a blighted segment of downtown Birmingham.

5.4 Support for Existing Business Opportunities

Traditional development opportunities are most often classified as one of two types. The first is the “bird-in-hand” effort, which facilitates the location or expansion of specific businesses willing to commit to a site. The second is a speculative development effort that seeks to prepare a building or site—or enhance the attraction of an area—by investment in infrastructure, construction or building rehabilitation. Both types of opportunities cut across the four project classification types. And both are well represented in the project database mix.

Facilitation of Bird-in-Hand Site Locations or Existing Business Expansions

ARC Infrastructure Program investment projects regularly facilitate bird-in-hand relocations or existing business expansions, in line with the most traditional economic development practices. Overwhelmingly, bird-in-hand projects were implemented as anticipated, with firms following through on job-creation commitments. Even where this wasn’t the case, other users or anticipated developments made the most of the original investment in all but a handful of cases.

Examples of bird-in-hand development

- Barmet Industries, an aluminum recycling facility, was sited in Tuscarawas County, OH (#10922), creating 144 new jobs with the help of an ARC-funded sewer line.
- In Cullman County, AL, two water and sewer projects (#10488 and #10572) brought services to a new Wal-Mart and a Louisiana Wood Chip plant, enabling the creation of over 1,100 new jobs and opening additional acreage to development.
- A Towns County, GA (#11027) wastewater project created 75 jobs at a newly developed Crown Plaza Hotels resort complex.
- In Madison County, AL (#99994), road and utilities investment assisted Acustar in bringing 650 direct jobs and more in attracted suppliers.
- Infrastructure improvements for Veriform, an aluminum products manufacturer, facilitated 385 new jobs in Marion County, TN (#11082).
- A project in Union County, MS (#10617) brought water and sewer service to a new Wal-Mart Food Distribution Center and created 925 jobs.
- A 70-job, 80-bed nursing home in Clay County, NC (#11151) was developed with a sewer project funded by the ARC.
- A sewer project was developed to serve a proposed BMW plant in Greenville-Spartanburg, SC (#11163), bringing thousands of direct and indirect jobs to the area. The sewer system also serves the city of Greer.
- In Chautauqua County, NY, the Metal Tech project (#11158) aided construction to expand an incubator, creating 60 new jobs and retaining another 60 in the area.
- In Jackson County, GA (#10839), a wastewater treatment plant was developed to serve both Mitsubishi Electronics and the Chateau Elan winery, creating 354 jobs and over \$90 million in private investment. Although Mitsubishi has since closed, the winery and other new and retained businesses have far surpassed job projections.
- A Boyd County, KY, sewer project (#11204) enabled 50 existing employers to add more than 950 jobs over a two-year period.
- In Johnson County, TN (#12372), site and sewer improvements for an NN Ball & Roller factory brought 50 jobs to the area, helping to diversify the economy away from dependence on textiles and wood.

Not all bird-in-hand projects were as successful as planned since company and industry downturns cannot always be anticipated. Two cases stand out. In Lee County, MS (#11145), an access road for the Bryce-Toga plant failed to live up to expectations when Bryce-Toga changed production plans and scaled down its investment. In Choctaw County, MS (#10936), an access road was intended to service the Package Corporation of America's Utility Pole Mill, but a downturn led to the plant's closure.

In some cases the original bird-in-hand evaporated—but the basic sensibility of the project or project site turned out to be sound. Bird-in-hand projects sometimes led directly to services critical to the development of new businesses or relocations unforeseen when the project originated.

Unforeseen positive outcomes from bird-in-hand projects

- In Clermont County, OH, the James River Corporation, the intended user of an access road project (#8851), closed its operation but the building was taken over by Structural Dynamics Research Group, which expanded from 820 to 1,120 jobs.
- A Belmont, OH, Industrial Park project (#10574) was intended to serve a UPS facility, which was to have been the park's first tenant. In the end, local officials decided to use the site to compete for a large state prison complex, which provides 500 jobs.
- Jamestown, NY (Chautauqua County): An access corridor (#10513) was provided to locate a candy manufacturer (which has since folded) in a multi-tenant building. In its place, five new businesses were attracted to the complex.
- Caldwell County, NC (#12204): A sewer project for Kincaid Chair looked disappointing when Kincaid curtailed expansion plans. However, 40 new jobs have been created in five other new, small businesses that use the sewer line.
- Cambria County, PA (#11396) Industrial Park Infrastructure: The original targeted firm never developed operations, while a significant new firm (McAneny Foods) was attracted to the site. Unexpectedly, two service companies are also moving regional facilities into the park and new acreage is being developed.
- Lee County, MS Turner Industrial Park Access Road (#10934): The road was funded to serve Bassett Manufacturing, creating up to 400 jobs. Bassett moved in, as expected, but went out of business because of competitive pressures. However, four other firms were recruited and original employment projections were exceeded.

Investment in Speculative Development Efforts

Like a number of other federal and state development programs, ARC infrastructure investments have also recognized the need for speculative development efforts, especially the creation of industrial park space and businesses incubators. Most projects were developed without specific commitment from firms to locate. A number of projects classified as water and sewer projects actually contributed to industrial park developments.

Although the maturation period for speculative development is longer than that usually found in bird-in-hand projects, the success of ARC investments in speculative projects is quite clear. In some cases, such as the Buchanan County project summarized below, project impacts exceeded other growth patterns in the area. For projects that have had time to mature, results were generally at or above projections. Overly optimistic projections for some industrial parks (see the second box below) should not minimize the very real gains that have been made in difficult local conditions.

Selected successful speculative development projects

- Cattaraugus County, NY (#10621): An unusually flexible use of ARC funds was reflected in the development of a road linking two New York towns—Olean and Allegany. The road created an entire commercial corridor now populated by industrial, retail, and professional operations, implementing an original vision of the New York Economic Development Zone. As a result, the corridor is now an economic center with a diverse economic base. Direct project jobs accounted for more than one-third of the net job growth in the county in 1990-96.
- A 242-acre industrial park was developed in Clark County, KY (#11141). Fourteen business have located on-site as a result of the sale of multiple speculative buildings.
- Buchanan County, VA (#11168): An ARC project brought water and sewer lines to a small industrial park in this distressed county. The park has become home for two call centers (exceeding job projections) and created a base of activity that has helped the county market to others.
- An incubator designed for larger start-ups in Itawamba County, MS (#10354) has hosted five firms (three graduates) and helped generate 155 current jobs, including one tenant with 60 jobs at present.
- Project #10572 served the development of one speculative industrial park in Cullman County, AL. The speculative park has also sparked the development of a nearby private-park development served by the same water and sewer investment.

Less successful speculative development projects. Not all speculative projects are as successful as originally projected (or as quickly as hoped), but most still generate significant job numbers in otherwise difficult situations.

- A project in Rowan County, KY (#12151) provided water for an industrial park in this (now) distressed county. The park has attracted one major business to the location but has fallen behind projections. A speculative building developed on-site remains vacant.
- A water/sewer project in Stephens County, GA (#10855) was part of a 200-acre industrial park effort that has located six firms and facilitated the development of 90 new jobs. While the project has fallen far short of original job projections (725), it has contributed growth in a county that saw a net decline of jobs in 1990-96.
- Beaver County, PA (#11679): Like many brownfield developments, this speculative effort in the historic steel town of Aliquippa is projected to pay off handsomely after a slow start. Although far behind original optimistic job projections, the site is now developing a home for a major gypsum operation that will bring 300 jobs to the area and, as important, productively use a portion of a site that has been a symbol of community blight for several years.
- Rockcastle, KY (#11587): This distressed county industrial park water project has only recruited only one site since the park went online in 1995, although an option has been developed for another eight acres. Even the limited number of jobs developed (47 direct) account for more than 15 percent of the county's 1990-96 net growth. Moreover, slow marketing of industrial park space should be anticipated for this policy-driven investment in distressed rural area.
- A 300-acre site with 20-30 parcels in Luzerne County, PA (#10887) was developed as a white-collar, back-office business park. This project represents a non-traditional diversification approach which has only begun to pay off with the siting of a single facility since 1994, creating about 10 percent of the jobs originally projected for the park. Local agencies have been placing priority on more intensive manufacturing demand at other sites, but are now beginning to concentrate on marketing the business park.

A handful of areas used “speculative” infrastructure to capitalize upon high growth potential. While representatives from higher growth counties are clearly happy with past

ARC assistance, several express concerns that they have “developed themselves” out of an opportunity for future grants because of the higher economic status.

Higher growth speculative development projects

- Habersham County, GA, water project (#10842): Assisting the county’s move to competitive status, the project was designed to accelerate the economy in the highest growth section of the county. The project served a mix of industrial, agricultural and residential users. Jobs assisted ran about five times initial projections.
- The Vista Industrial Park water/sewer project in Buncombe County, NC (#11376) assisted a speculative venture that has attracted eight firms with over 400 jobs. While less labor intensive activities have dampened job totals, numbers of firms and investment are impressive. Equally so is the development of the rest of the corridor now served by the water and sewer lines, including additional industrial locations and the development of a new (private) industrial park. This county has also moved up to “competitive” status since the project was initiated.
- The Greenville-Spartanburg BMW sewer project (#11163) has spurred levels of success that local development officials fear will mask continuing needs in the metropolitan area.
- The Birmingham BAN/BEC incubator (#10751) in Jefferson County, AL, is trying to expand into a new facility, but staff is worried that the 2000 census will move Jefferson County into a competitive or attainment category that would constrain future ARC investment in its still-blighted local area.

5.5 Strategic Investment Efforts

The majority of ARC Infrastructure Program investments appear to have been made without regard to overall strategic focus. Many of these investments were aimed at site or market-specific need or opportunity, as are most development projects. However, an impressive number of projects were consciously aligned with regional strategies, or developed industry clusters at the strategic core of the area economies.

For the most part, it is clear that projects developed as part of broader strategic planning efforts not only are highly successful by most common measures, but also receive focused attention from local officials and service providers (not just sponsoring agencies) that maximize success and create synergy with other area development efforts. The Benedum, WV, Airport project has clearly created a public-private partnership toward the development of regional cluster. The Hagerstown TIC has demonstrated that rural area’s potential as a manufacturing magnet and center. The two Erie, PA, incubators have focused attention on the industrial redevelopment of an urban core.

Examples of strategic development projects

- The Benedum Airport project in Harrison County, WV (#10381) was developed with a specific vision of redefining the area as an aerospace center. Direct project impacts amount to more than 18 percent of the county's net growth in 1990-96, while direct and indirect jobs generated account for 49 percent of net growth.
- The Hagerstown Technical Innovation Center (#11000) identified a strategic need for ongoing technology assistance to regional manufacturers, adding an attractive service and marketing element to a traditional business incubator model. Direct project impacts amount to almost 15 percent of the county's net growth in 1990-96, while direct and indirect jobs generated account for 26 percent of net growth.
- An industrial park project (#11110) in Tishomingo County, MS, was developed to create long-term opportunities that capitalized on the area's river port asset, part of a long-range plan for development of about 1,000 acres on the Ten-Tom Waterway.
- Two projects in Erie County, PA (#11197 and #11162) were designed and implemented to create training and employment opportunities for urban workers in Erie's high-poverty core, including an effort to lure suburban manufacturing firms back to the city with the promise of a plentiful and reliable workforce.
- Lee, MS: The Coley Road Improvements project (#11102) supported an expansion of the Tupelo Furniture Mart, the second largest of its kind in the United States. Direct project impacts amounted to 10 percent of the county's net growth in 1990-96, while direct and indirect jobs generated accounted for 16.5 percent of net growth.
- A water project in Winston County, AL (#10489) enabled the expansion of three firms in the region's core furniture manufacturing cluster to grow from 175 to 600 employees. Direct project impacts amounted to almost 18 percent of the county's net growth in 1990-96, and direct and indirect jobs accounted for 24 percent of net growth.
- A project in McKean County, the Multi-Tenant Complex (#10828), has capitalized on cluster locations by sponsoring networking and shared equipment use among tenant woodworking firms. Along with the particleboard project, direct jobs from ARC investments are responsible for 33 percent of net job growth (1990-96) in the county. All jobs stemming from ARC projects account for 58 percent.
- Project #9994 in Madison County, AL, revolved around development of a horizontally integrated industrial complex anchored by Acustar, a Chrysler automotive component producer. Sixteen firms and 650 jobs, most related to Acustar, have located at the site.

5.6 Support for Traditional Industries

A number of ARC-funded projects have been used to support traditional industries. Although some projects in extractive, resource-based industries produced relatively few direct jobs, they were often seen by local leadership as critical to many more jobs in related industries.

Examples of support for traditional industries

- Tishomingo County, MS: The Tishomingo County Access Road project (#9711) funded a road to a limestone quarry in Iuka. The project retained just 25 jobs but supported an additional 30 jobs in a related operation and over 100 jobs in materials transport.
- In Cullman County, AL, the Hanceville Industrial Park project (#10488) provided infrastructure for a \$45 million chip board plant, generating 175 direct jobs and providing employment for an estimated 750 timber cutters and 250 truck drivers.
- Similarly, the Marion Smith Access Road project (#10892) provided funding for a wood chip mill in Choctaw County, MS, with a regional job multiplier locally estimated at four indirect and induced jobs to each direct job.
- Jefferson County, AL: The King Point Water Line Extension (#10988) enabled a \$100 million investment in a new coal mine that created 822 jobs for miners paying annual wages of \$36,000 to \$45,000. The project also provided public water to the community's 200 households, many of whom previously had to haul water because wells were contaminated with mud and iron.

5.7 Mitigation of Environmental Problems/Quality-of-Life Factors

Projects have addressed long-standing infrastructure issues that provide basic necessities and correct problems caused by environmental repercussions such as the effects of mining. Correction of these problems is often a prerequisite to economic revitalization.

Among these projects, the viability of some funded communities is questioned by even the leadership of the communities themselves. In others, provision of basic services led to significant new economic opportunities facilitated by the same project.

Examples of projects that mitigated environmental problems

- Dickenson, VA (#11165): The project provided a public water supply system to a community in which the aquifer had been depleted and wells were either dry or contaminated due to coal mining.
- In Nauvoo, Walker County, AL, (#10757) ARC funds installed an elevated 300,000-gallon water storage tank without which the existing water system—and the community, according to local leaders—would have “shut down.”
- Powell, KY (#11091): This Clay City wastewater project was needed to correct environmental violations which would have imperiled the safety of town residents and required a moratorium on development. Since the project, 50 new houses have been built.
- A pumping station in Clay County, MS (#11111) provided public water to 100 households that relied on hauled water or contaminated wells. Service to existing customers was also upgraded, making it possible for the first time to bathe or to wash a car any time of day.
- In Polk County, TN (#11080), improvements brought the water system into compliance with state standards, creating a growth spurt that was partially a result of the development of a water bottling firm with 100 new jobs, and the expansion of water service to nearby towns.
- Wayne, WV (#12128): ARC funded construction of 8.5 miles of water line to supply public water to 203 homes in the Kenova area. Previously, people relied on wells, half of which were contaminated. The need had been recognized for 20 years.
- A Boyd County, KY, sewer project ended a moratorium on development and created the basis for 950 new jobs from existing firms as well as a 200-acre industrial park development (#11204).
- A water and sewer project in Walker County, AL (#10997) served a community that did not have the necessary clean water to serve its citizens or attract basic business services. As a result of the project, the core needs of the community are being met, including the ability to sustain basic requirements of commerce. Several businesses have been attracted, generating commerce and services to the population in a town characterized by one official as "just hanging on" prior to project implementation.

Community quality of life. Other projects have reduced commuting time and expenses for residents by bringing jobs to communities where residents had been previously required to travel long distances for employment. Of course, these investments were primarily focused on development impacts, not convenience.

- Jackson County, GA: The Braselton Wastewater Improvements project (#10839) generated 1,387 jobs in this Georgia community for people in the local area who were previously faced with daily commutes of up to three hours.
- Rockcastle County, KY: At the Rockcastle Industrial Park (#11587), jobs paying \$14/hour have been created for Kentucky workers who were previously faced long commuting journeys to access quality employment opportunities.

Other quality-of-life improvements. A number of local development representatives pointed to indirect quality-of-life improvements for community residents that resulted from ARC economic development investments.

- Home ownership is a major means to accumulate wealth for many lower income households. High-quality blue-collar jobs created by ARC projects have enabled many in low-income households to become first-time homeowners. In Lee County, MS, local officials credit the Turner Industrial Park Access Road project (#10934) with catalyzing 600 new jobs paying an average of \$25,000 a year, enabling many lower income people to buy their own homes for the first time.
- Cullman County, AL: Some ARC-funded projects have indirectly provided health insurance to previously uninsured workers for the first time. The Cullman Infrastructure Improvements project (#10572) brought 1,000 new quality jobs in manufacturing and services into this Alabama community, most of which have full benefits and provide health insurance coverage to many local families for the first time.
- Increased household incomes associated with ARC projects have motivated a greater proportion of people in some communities to seek higher education. In Marion County, TN, the Jasper Veriform Industrial Location project (#11082) provided 385 quality jobs in an aluminum siding plant paying an average of \$30,000 a year. Local representatives indicate that the increased incomes that resulted are responsible for higher enrollment at the local junior college.

Support for the creation of new local blue-collar jobs is an important development objective for areas experiencing high-tech industry growth where many of the new jobs accrue to highly skilled people from outside the region. For example, in Huntsville, Alabama, workforce demand spawned by NASA-related industries has largely been fed by qualified engineers from outside the region. The ARC-funded Industrial Park Infrastructure Project (#9994) produced 650 blue-collar jobs for less skilled workers, paying annual wages of \$11.5 million. In contrast, the West Virginia Hi-Tech Consortium Incubator Project (Marion County, WV; #11493) assisted 310 jobs that have gone to highly skilled, mainly non-local people. Although indirect benefits of increased jobs and income in the community have trickled down through the service sector, there is still high structural unemployment among blue-collar workers.

5.8 Summary

The variety of characteristics, impacts, and common themes throughout the sample is impressive. In general, bird-in-hand, speculative, strategic, and quality-of-life projects have been solidly successful in their own right. Moreover, the basic strategy of the projects is sound enough and flexible enough so that in most cases where original plans went awry, new development options surfaced and were implemented with significant impact.

Projects that resulted from broad strategic planning, area targeting or careful recruitment efforts appear to yield the largest results. The BMW marketing effort in Spartanburg-Greenville and cluster development project in Clarksburg, West Virginia, represent only two of the most visible examples.

6. Economic Conditions in Project Areas

The goals of ARC investments are not just to create jobs and income, but also to improve economic competitiveness, self-sufficiency, and entrepreneurial vitality in areas of need. Thus, this report attempts to measure the extent to which the local project areas are fostering economic diversification, economic vitality, and entrepreneurial success.

These measures are included as a baseline for comparison, rather than as a direct reflection of project impacts or consequences. In some cases, job growth or diversification analyses clearly reflect high job creation resulting from an ARC investment (e.g., Greenville-Spartanburg sewer project). In other cases, an assessment of economic vitality and entrepreneurial success can demonstrate the need for the services offered by business incubators, or the actual impact of an incubator (e.g., Bradford, PA incubator). By and large, though, the analyses of conditions in project areas should be viewed as context for the projects themselves and a guide to current development needs—not as a direct reflection of sample projects themselves.

Type	Years	Source	Rate type	Description
Job growth	1990-96	CBP*	% growth	% change 90-96
Job growth rate	1990-96	CBP	U.S.=100	Benchmarked change
Diversification	1990-96	CBP	U.S.=1.00	Sector benchmarks
Start-up activity	1996-99	Credit data	U.S.=100	Starts per total firms
Start-up survival	1996-99	Credit data	U.S.=100	Retained firms 0-3 years
Firm retention	1996-99	Credit data	U.S.=100	All retained firms
Job replenishment	1996-99	Credit data	U.S.=100	Growth measure among retained firms

*CBP: U.S. Census Bureau's County Business Patterns

A set of economic analyses was developed for the project counties and, in some cases, larger impact areas. The analyses were developed from two different sources and cover widely varying time frames and widely varying measures. Growth and diversification analyses were developed for each project impact area, as defined by local interviewees, for the years 1990-96 using the Census Bureau's County Business Patterns.¹⁷

The several vitality analyses were developed with a variety of private-sector credit reporting databases, and cover the reporting years 1996-99.¹⁸

Because projects in the database were initiated and completed over a ten-year period, and because projects have widely divergent maturity periods and impact missions, the real value of the economic and vitality analyses is the view they offer not of project impacts themselves but of the areas in which the projects were developed. For this reason, the aggregate analysis of economic and vitality measures is relatively brief, but the numbers developed for local areas may assist in the development of strengths and weakness at all local levels.

The categories of economic data analysis are summarized in Table 6.1. Since all but one of the analyzed projects were in distressed or transitional counties, vitality trends are likely lower than for the Region as a whole. On the other hand, economic development project applications naturally appeared to be received mainly from areas that perceived opportunity; thus, areas with the lowest levels of vitality may also have been excluded from project investments and thus the analysis.

6.1 Growth Analysis

The growth analysis measures job growth in each project area in 1990-96, and is developed in two different forms. In order to give an absolute indication of growth, *job growth* is described as a percentage of 1990 totals. Second, the job growth percentage for each project area was benchmarked against the corresponding U.S. job growth rate where U.S. equals 100. That is to say, project areas with growth superior to that of the United States scored over 100, while underperforming areas scored below 100.

As shown by Table 6.2, 42 of the 76 project areas had job growth rates superior to U.S. job growth patterns for the years 1990-96. Of these, 25 also performed better than U.S. trends in both the *firm retention* and *job replenishment* categories.

While the sample size makes regional comparisons difficult, it's worth noting that a cluster of project areas in the mid-Atlantic ARC states of Pennsylvania, New York, Maryland, and Virginia reflected far lower 1990-96 growth patterns than the overall sample. In general, a higher proportion of rural areas in the database indicated better-performing job growth patterns than did those in metro areas.

Project areas performing above the U.S. average included ten counties designated as distressed at the point of project initiation. (Note that the job growth rate measures the percentage of absolute growth, so a distressed county with a relatively high growth rate could have serious problems and still evidence high *relative* growth.)

State	Total Project Areas	# w/ Job Growth >U.S.	% Growth Areas
Alabama	8	6	75%
Georgia	6	5	83%
Kentucky	10	7	70%
Maryland	2	1	50%
Mississippi	10	4	40%
New York	4	1	25%
North Carolina	4	3	75%
Ohio	5	4	80%
Pennsylvania	8	2	25%
South Carolina	2	1	50%
Tennessee	5	2	40%
Virginia	4	0	0%
West Virginia	8	6	75%
All Metro	22	13	59%
All Rural	44	29	66%
All Project Areas	76	42	56%

Five of these counties have currently moved to “transitional” designations. Projects in these counties all began in 1995 or earlier, so these project impacts may have had time to mature in time to be reflected in the 1996 County Business Patterns data. Of the counties that began with distress designations and registered higher-than-average growth rates, nine also showed overall retention rates over 100. Five of these counties—Gilmer, GA; Grainger TN; Lincoln and Rockcastle, KY; and Wayne, WV—also reflected job replenishment rates higher than the U.S. average (see the explanation of job replenishment in Section 6.3).

Also noteworthy are the truly impressive growth rates of the 19 project areas that claimed more than twice the national job growth rate in the 1990-96 period. Ten of these areas were in the southern states of Alabama, Georgia, and Mississippi. Thirteen of these areas were rural, while only six were the beneficiaries of metropolitan spillover, with three of these in Alabama.

6.2 Area Growth and Relative Project Impacts

In order to assess the relative impact of ARC investments, the direct job impacts of projects in the sample were compared with the total net job growth of primary impact counties 1990-96. Although time frame discrepancies between the net job growth measurement period and various projects make this an imperfect measure, nonetheless it is a reasonable yardstick of relative impact.

Sixty-five of the seventy-six project counties qualified for this assessment. Counties with only non-economic development water and sewer projects were excluded. Four categories of relative impact were established:

Table 6.3 Relative Impacts: Area Growth and Direct Project Jobs																																					
<p>>10% of net growth;<100 direct jobs(11 counties)</p> <p>Cambria PA Choctaw MS Dickenson VA Forest PA Johnson TN Luzerne PA Monroe KY Rockcastle KY Scott VA Stephens GA Winston MS</p>	<p>>10% of net growth;>100 direct jobs (34 counties)</p> <table border="0"> <tr> <td>Belmont OH</td> <td>Habersham GA</td> <td>Polk TN</td> </tr> <tr> <td>Boyd KY</td> <td>Harrison WV</td> <td>Pontotoc MS</td> </tr> <tr> <td>Buchanan VA</td> <td>Itawamba MS</td> <td>Powell KY</td> </tr> <tr> <td>Campbell TN</td> <td>Jackson GA</td> <td>Rowan KY</td> </tr> <tr> <td>Cattaraugus NY</td> <td>Lee MS</td> <td>Stueben NY</td> </tr> <tr> <td>Chautauqua NY</td> <td>Lumpkin GA</td> <td>Towns GA</td> </tr> <tr> <td>Cherokee SC</td> <td>Marion WV</td> <td>Union MS</td> </tr> <tr> <td>Clark KY</td> <td>Marion TN</td> <td>Venango PA</td> </tr> <tr> <td>Clay NC</td> <td>McDowell NC</td> <td>Washington MD</td> </tr> <tr> <td>Cortland NY</td> <td>McKean PA</td> <td>Winston AL</td> </tr> <tr> <td>Cullman AL</td> <td>Mercer WV</td> <td></td> </tr> <tr> <td>Grainger TN</td> <td>Mifflin PA</td> <td></td> </tr> </table>	Belmont OH	Habersham GA	Polk TN	Boyd KY	Harrison WV	Pontotoc MS	Buchanan VA	Itawamba MS	Powell KY	Campbell TN	Jackson GA	Rowan KY	Cattaraugus NY	Lee MS	Stueben NY	Chautauqua NY	Lumpkin GA	Towns GA	Cherokee SC	Marion WV	Union MS	Clark KY	Marion TN	Venango PA	Clay NC	McDowell NC	Washington MD	Cortland NY	McKean PA	Winston AL	Cullman AL	Mercer WV		Grainger TN	Mifflin PA	
Belmont OH	Habersham GA	Polk TN																																			
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Grainger TN	Mifflin PA																																				
<p><10% of net growth;<100 direct jobs (8 counties)</p> <p>Allegany MD Blount AL Caldwell NC Gilmer GA Lowndes MS Putnam WV Russell KY Washington OH</p>	<p><10% of net growth; >100 direct jobs(12 counties)</p> <table border="0"> <tr> <td>Alcorn MS</td> <td>Lauderdale AL</td> </tr> <tr> <td>Beaver PA</td> <td>Logan WV</td> </tr> <tr> <td>Buncombe NC</td> <td>Madison AL</td> </tr> <tr> <td>Clermont OH</td> <td>Muskingum OH</td> </tr> <tr> <td>Erie PA</td> <td>Tuscarawas OH</td> </tr> <tr> <td>Grnville.-Sprtnbg. SC</td> <td></td> </tr> <tr> <td>Jefferson AL</td> <td></td> </tr> </table>	Alcorn MS	Lauderdale AL	Beaver PA	Logan WV	Buncombe NC	Madison AL	Clermont OH	Muskingum OH	Erie PA	Tuscarawas OH	Grnville.-Sprtnbg. SC		Jefferson AL																							
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Highest relative impact was registered in counties where projects stimulated more than 100 direct jobs and accounted for more than 10 percent of total job growth as reflected in the 1990-96 measurement. Thirty-four counties reached both thresholds.

A second tier of high impact was indicated for 11 counties where direct project jobs did not reach 100 percent but where the achieved totals accounted for more than 10 percent of net 1990-96 job growth.

Another 12 project counties reflected more than 100 direct jobs from ARC investments, but direct job totals were less than 10 percent of net county job growth in 1990-96.

The relative impacts were considered most modest in those eight counties that were less than “100 jobs created” and less than the “10 percent net growth” threshold attributable to ARC projects.

In sum, the relative impacts of investments in primary project counties are significant in both depth and breadth. Forty-nine percent of the counties examined met both “high impact” thresholds. Job impacts exceeded 10 percent of net job growth in 69 percent of the counties examined, and exceeded 100 direct jobs in 68 percent.

The same measurements, when applied to total (direct and indirect) jobs generated by projects, are even more impressive. Fifty-two counties (80 percent of those examined) show project impacts greater than 10 percent of net job growth. Forty-four (68 percent) met both the net growth and total jobs thresholds.

Geographic Variation of Growth

- Naturally, there are individual stories behind each of these relative impact measures. Some reflect exactly what appears at face value: large projects with major impacts on both robust regions (Spartanburg-Greenville, SC) as well as those that are more modest in size and growth experience (e.g., McKean, PA).
- Ten of the measured counties experienced negative net job growth during the 1990-96 measurement period, making ARC projects all the more significant in terms of regional impact. These counties were Buchanan, VA; Chautauqua, NY; Choctaw, MS; Cortland, NY; Dickenson, VA; Itawamba, MS; Luzerne, PA; Scott, VA; Union, MS; and Venango, PA.
- Projects in relatively large metropolitan environments created significant numbers of jobs but by their nature did not reflect a 10 percent impact on the project county. Incubator projects in Erie, PA, and Birmingham, AL (Jefferson County) fell into this category. In others, even projects generating fewer than 100 jobs exerted a major impact on counties with small projects (Forest, PA; Dickenson, VA) and, in some cases, in larger counties with relatively stagnant growth (Cambria, PA).

6.3 Economic Vitality

Each segment of the four economic vitality analyses was developed through a variation of the “firm life” methodology. A more detailed description of the methodology can be found in Appendix D.

Four measures were included in the vitality analysis:

- *Entrepreneurial Activity*, as measured by a comparison of start-up rates across the United States with rates in each project area. The results of each local area were compared with U.S. results where U.S. equals 100.
- *Entrepreneurial Survival* rates were developed for each project area. The percentage of surviving young firms in each area was then benchmarked against U.S. patterns where U.S. equals 100. Together with the entrepreneurial activity rate, the resulting entrepreneurial survival rate creates a quantifiable measure of entrepreneurial vitality in each project area.
- *Firm Retention Rate* supplements the entrepreneurial survival rate and tracks all firms across the United States and within each project area in the 1996-99 period.
- *Job Replenishment Analysis* compares the number of jobs lost by failed firms in the firm retention analysis with those added by survivors over the same period. The replenishment rate serves as an important supplement to the firm retention rate, which can reflect high scores in areas with relatively stagnant economies, as well as those that have more robust economic conditions. In general, high retention and replenishment rates signal economic vibrancy even in areas that are not business migration leaders or “hot spots” for start-up activity.

Findings. Generally, the vitality analysis identified entrepreneurship as the clearest need in most project counties. Of the seventy-six project areas, only six met or exceeded U.S. start-up rates of activity for the years 1996-99, including only one county classified as rural. Two of the higher performing areas were in Alabama; the others were in West Virginia, Tennessee, and Mississippi.

Nineteen of the twenty counties in the sample *currently* designated as distressed counties reflected start-up activity rates below the U.S. average of 100.

Of even greater concern, 61 of the 76 project areas indicated start-up rates at least 10 percent below national patterns (scoring 90 or less). Mississippi counties in the sample scored remarkably well in this analysis. Moreover, survival rates of young firms (0-3 years in operation as of 1996) were somewhat better than overall rates; 28 project areas had start-up activity rating less than 91 *and* young firm survival rates that were lower than the U.S. average. By themselves, high entrepreneurial survival rates may not be as

impressive as they first seem; when coupled with low start-up activity and overall growth, higher survival rates may merely reflect a lack of competition.

In this regard, 33 project areas reflected job growth (1990-96) below U.S. averages *and* lower-than-average start-up activity rates. Of these areas, 19 also had job replenishment rates lower than the U.S. average. All four of the Virginia project counties as well as four of Pennsylvania's eight project areas appear in this higher risk category.

State	Project Areas	Start Activity >90% of U.S.	% of Areas	Survival>U.S. (firms 0-3 years.)	% of Areas
Alabama	8	2	25%	2	25%
Georgia	6	0	0%	3	50%
Kentucky	10	0	0%	4	40%
Maryland	2	0	0%	2	100%
Mississippi	10	7	70%	6	60%
New York	4	0	0%	4	100%
North Carolina	4	0	0%	2	50%
Ohio	5	1	20%	5	100%
Pennsylvania	8	0	0%	7	88%
South Carolina	2	1	50%	0	0%
Tennessee	5	2	40%	3	60%
Virginia	4	0	0%	2	50%
West Virginia	8	2	25%	2	25%
All Metro	22	6	27%	13	59%
All Rural	44	9	20%	29	66%
Distressed	20	5	25%	7	39%
Non-distressed	56	10	18%	35	60%
All Project Areas	76	15	20%	42	55%

The prevalence of a low level of entrepreneurial activity in project areas strongly suggests a need for an increased focus on start-up assistance. Indeed, these findings highlight the important contribution of the relatively small number of incubator projects in stimulating entrepreneurial activity. Areas such as McKean and Erie, PA, which have recognized their gaps in start-up activity and actively used ARC resources to target start-up efforts, should be applauded. Other areas that have exhibited very strong growth patterns largely because of business in-migration and activity surrounding the location of branch plant sites should also be encouraged to add focus on entrepreneurialism, which can serve as an offset to future surprises from absentee-owned firms.

The overwhelming majority of project areas demonstrated higher-than-average firm retention rates for the period 1996-99. However, the firm retention measure can by itself be deceiving, in some cases masking high start-up “churn” levels and in others a generally stagnant economy. Thus, a better look at the vitality of existing businesses in the area can be developed by screening areas with high retention for high *replenishment* rates as well. This screening reduces to 50 percent the number of areas with above-average performance. Rural Virginia project areas again stand out as a weak spot. Overall performance is reasonably matched in both metro and rural, distressed and non-distressed areas.

State	Project Areas	Retention >U.S.	%	Replenishment >U.S. & Retention >U.S.	% of Areas
Alabama	8	4	50%	2	25%
Georgia	6	4	67%	4	67%
Kentucky	10	9	90%	6	60%
Maryland	2	2	100%	2	100%
Mississippi	10	8	80%	5	50%
New York	4	4	100%	2	50%
North Carolina	4	4	100%	2	50%
Ohio	5	5	100%	5	100%
Pennsylvania	8	7	88%	3	38%
South Carolina	2	2	100%	1	50%
Tennessee	5	3	60%	1	20%
Virginia	4	1	25%	0	0%
West Virginia	8	7	88%	5	63%
All Metro	22	18	82%	11	50%
All Rural	54	42	78%	27	50%
Distressed	18	15	83%	12	67%
Non-distressed	58	45	78%	26	45%
All Project Areas	76	60	79%	38	50%

The relatively positive rates of job growth, firm retention and the vitality of existing firms may be a pleasant surprise for observers of the Region. However, while the overall news is good, there are causes for concern. Indeed, 33 project areas registered below-average scores in both entrepreneurial activity and job replenishment. This “at risk” group, which contains only seven FY2000 distressed areas, combines low growth among existing firms with low start-up activity—a combination that calls for attention.

Individual growth and vitality scores for each primary project area are available electronically in a separate Access database.

Summary

In sum, four important points can be discerned from the overall trends reflected in the economic analyses:

- ARC investments demonstrate very significant impacts on local project areas relative to overall growth patterns. Of 65 areas for which measures could be developed, 34 project investments yielded both 100 direct jobs and 10 percent of all net job growth in the primary impact area between 1990 and 1996. Another 11 counties can attribute to ARC investments fewer than 100 jobs but more than 10 percent of all net job growth in the sample.
- Perhaps as important for the future, entrepreneurial activity rates are generally very low and in need of serious, concentrated attention.
- While diversification is an important ingredient of regional vitality, job growth patterns in the project areas were most positive among those areas that began with large manufacturing sectors and then maintained their manufacturing base (and often diversified within them). A reasonable conclusion points to the continued importance of nurturing and diversifying within the Region's manufacturing sector.
- Basic retention rates are positive, but retention rates coupled with the significant job replenishment indicator suggest a low level of growth among existing firms in many areas. These findings merit additional policy consideration.

7. Issues and Recommendations for Program Improvement

This report is fundamentally concerned with the evaluation of projects. As such, this discussion and the modest recommendations are submitted as a reflection on issues that arose from the evaluation of the 99 projects. These observations are not meant as a total assessment of the program, its priorities, or its delivery system.

7.1 Consideration of Impacts on Downtown Commercial Districts

During the course of interviews with grantees and other local representatives, concern was expressed that some projects have supported uncontrolled “sprawl” development that has led to the loss of jobs and population in small town centers.

Issues of sprawl and development

- Clay County, NC: The Hayesville Water/Sewer Improvements project (#11151), which was intended to support a nursing home, is thought to have led to the development of a strip mall and other auto-related uses on greenfield sites on the outskirts of town. Local observers consider this project to be responsible for high downtown vacancy rates. Officials identified a significant level of downtown disinvestment and relocations of businesses from older downtown properties.
- Greenville-Spartanburg Metro area, SC: Perhaps the largest and most successful project evaluated during the course of this review was the BMW sewer project (#11163) in Greer, SC, which provided \$2.2 million to support a BMW plant with 1,000 jobs. Since then, employment at the plant has been expanded to 3,000 jobs with an annual payroll of \$120 million, and two additional expansions have been announced. The region has become a locus for investment by BMW’s suppliers, 15 of whom have located in the area, creating 1,500 additional jobs. But the rapid development of greenfield sites that this growth has spurred has brought about traffic congestion and burdened the area with the costs of additional infrastructure. Improvements are now planned to ease traffic flow from employment centers and commercial strips, improvements which may also negatively affect existing small downtown commercial activity.

Conversely, in at least two cases represented in the sample, ARC funds have been used to replace existing infrastructure in city centers, and traditional commercial downtown areas have been the targeted beneficiaries. At least 13 examples of downtown revitalization assistance were contained in the universe of projects, but for reasons discussed in Appendix B, were not included in the sample of assessed projects.

Cases of revitalization of downtown development

- The Jellico Inflow/Infiltration project (#11098) resolved sewage back-up problems in the ailing downtown area, attracting new business and jobs downtown.
- The Birmingham Assistance Network incubator (#10751), now the Enterprise Development Center, consciously located in a blighted section of downtown Birmingham in order to spur community development. Results have been extremely modest so far, despite the enormous success of the incubator itself.

7.2 Follow-Up Technical Assistance and Operational Gaps

Projects in the smallest, most rural communities often don't live up to their broadest potential because of a lack of local technical resources. For example, a residential water project might open up commercial or industrial opportunities if local agencies had the resources and technical advisors to figure out just what to do. Several local interviewees suggested that an additional cost of technical assistance could be tacked onto an original grant pending completion of the physical project. The need for operational funding and other follow-up support for industrial park and especially incubator projects often arose, particularly in areas with lower growth or not connected to technically innovative projects. This is not to say that the results of projects in such areas are not beneficial—in most cases they are. But even more might be made of them with ongoing technical assistance.

Cases needing technical assistance or operational support

- In Nauvoo (Walker County, AL #10757) there is a recognized need and opportunity to use land opened up by a residential project for an industrial park. But the vision apparently continues to languish because of a lack of local capacity and political understanding of the process.
- The highly successful Hagerstown Junior College Technical Innovation Center in Washington County, MD (#11000) almost failed to survive its early years because of a lack of operational support.
- In Clay County, KY (#12257), sites were funded and developed in 1996 but still lay dormant for lack of water and sewer lines. A \$6 million expansion to the system—the need for which was known ahead of site funding—will be completed in the summer of 2000 along with construction of a \$500,000 spec building (50,000 sq. ft.) on the site. Recruitment to the site should start in autumn 2000.

Technical Assistance and Operational Support (continued)

- Where follow-up needs have been identified, ARC has been receptive to providing necessary follow-up support to take advantage of developing opportunities. In distressed Powell County, KY (#10845), development has outpaced the additional water treatment capacity created by the original project. As a result, treatment plant capacity once again needs to be expanded. ARC monies have been secured for this program and to provide an additional reservoir for the three-town district.
- In at least one case (Forest County, PA, sewer line; #10392) the impact of a sewer line extension on existing businesses was not clearly understood. In this case the creation of the line was important for the community and businesses, but a limited number of users elevated usage costs above sustainable levels for at least some businesses. On the other hand, the sewer line also made possible the current development of a state prison that will provide a wealth of good-paying jobs to the area.
- A sewer extension project in Scott County, VA (#12183) is allowing the county to take commercial advantage of a strategic geographic position—but the need for the same project could have been identified, in the view of local officials, 20 years ago with a modest level of technical assistance.

7.3 Zoning and Land Control Issues

In a few cases, projects in which ARC has invested appear to have triggered a heightened level of land speculation. To some extent, such pressures are inevitable, although pre-project attention to zoning controls might mitigate excessive and unwanted effects. In the case of the Birmingham BEC incubator project, its role as a speculative trigger is modest compared with the building pressure from adjacent downtown areas. In the case of the BMW facility in Greer, South Carolina, it is not surprising that land costs have soared around the high-growth corridor and rippled through the metro area, encouraged by both the BMW and FBI facilities (and no doubt increased by recent funding for a connecting four-lane expressway). External development issues raised by both of these projects are detailed elsewhere.

At least two other project areas appear to have experienced unwanted speculative pressures, at least partially resulting from the projects under review.

Examples of speculative pressures

- The very productive Benedum Airport project in Harrison, WV (#10381) coincided with the development of a nearby FBI lab facility that together triggered modest, yet unwanted, land speculation in the area.
- Despite vibrant development and full buildings generated by their ARC-funded projects, development officials in Cattaraugus County, NY (#10564 and #10621) suggest that a lack of understanding and unified local perspective on the need for better zoning controls has frustrated development of an industrial district. In the now-improved corridor, property costs have escalated far beyond reasonable industrial rates.

7.4 Opportunities for Improvement to Future Program Evaluations

Project Closeout Process. Currently, ARC has application information on expected public funding and private investment as well as closeout information on actual public funding. Remaining information on actual private investment could be substantially enhanced if this information is automatically collected as part of the project closeout process.

Tracking Quality of Jobs. There is a strong public policy interest in providing high-quality, good-paying jobs for economically depressed areas. Currently, many federal, state, and local economic development programs have made some efforts to track the number of jobs that they have helped create or retain. However, there is a remaining need for ARC to work with other federal, state, and local agencies to devise better data collection methods for assessing the quality of jobs, the associated wage rates, and even the extent of part-time vs. full-time hours associated with these jobs.

Recommendations

The Commission's investments and priorities have—and will continue to be—fundamentally driven by three factors:

- Internal policy objectives such as investment focus on at-risk areas, stimulation of entrepreneurship, and development of strategic industry clusters;
- Identification of objectives and opportunities by local and district-level development entities within the Region; and
- State priorities and fiscal constraints.

Recognizing these overriding factors, the comments that follow are offered to inform the program and its investment process.

- 1) The Region's administrative approach to the Program deliberately streamlines the development process by making commitments and following through without adding administrative burdens to either the Commission or its grantees. The current system is highly regarded by local development professionals and should be maintained.
- 2) The Infrastructure Program's ability to fund limited residential-only and speculative development projects is also highly valued. The Program's ability to provide flexible economic development investments without demanding a bird-in-hand is prized among economic development professionals. Looking at the projected and actual impact results, speculative economic development investment and residentially-targeted investments appear to have generally paid off.
- 3) A number of counties will likely have "developed themselves" out of future grants because of a higher economic status by the 2000 census. The Commission should consider promoting the "pocket of distress" concept to permit applications from distressed portions of those counties, which should be balanced against overall funding constraints of the Program and the local investment of these better-situated areas.
- 4) Small, rural communities often cannot pursue opportunities opened by projects in their areas because they lack technical resources. The Commission should consider providing funds for such an "add on" to grant applications from small or distressed areas.
- 5) Certain valuable projects, often in remote and distressed areas, are unlikely to be self-sufficient for several years. Follow-up operational support should be selectively considered, particularly in areas not poised for high growth. It is important to condition this support with an evaluation of the project sponsor's plan to develop self-sufficient operations. In general, this costly assistance would be best used for critical strategic efforts—such as the development of much-needed "full-service" incubators.
- 6) Along these lines, the performance of project areas relative to entrepreneurial activity is nothing less than alarming, especially in the northern Pennsylvania and southern New York corridor. Of the seventy-six project areas, only five met or exceeded U.S. start-up rates of activity for the years 1996-99, including only one county classified as rural. Moreover, 33 project areas register below-average scores in both entrepreneurial activity and job replenishment. This "at risk" group, which contains only seven FY2000 distressed areas, combines low growth among existing firms with low start-up activity—a combination that calls for attention and is recommended as one focus for future Program projects.

- 7) Project objectives can be frustrated by lack of unified local perspective on local issues, including the following.
- Project buy-in should probably include commitments from non-recipient agencies (e.g., area zoning commissions) in a position to influence project outcomes.
 - Concern surfaced that some projects encouraged uncontrolled “sprawl” development that led to the loss of jobs and population from small town centers. In a few cases, projects appear to have triggered a heightened level of land speculation. Several projects suggest the need for broader policy reviews of motivation and options prior to funding.
 - Consideration of regional (and regionalization) impacts was rarely addressed ahead of project implementation. For example, local sewer projects should commonly be assessed in light of regional sewer system consolidation options.
 - Commercial- and retail-focused projects should consider impacts on commerce in adjacent (usually ARC) areas.
 - Should an economic project that will primarily create a competitive advantage to a community or county near a state border because of tax benefits be encouraged? Such a question is difficult to answer in the abstract—but efforts should be made to identify and grasp these and other likely indirect impacts before the investment is implemented, not after the fact.
- 8) Only eight project areas indicated service-sector concentrations higher than the U.S. average. In seven of these, higher-than-average concentrations were the result of sector growth since 1990. In the same period, service concentrations increased in only 43 of 76 project areas despite the national explosion of firms and jobs in this sector. These findings suggest increased attention to development of traded services and projects targeting their development.
- 9) High manufacturing concentrations often correlated with high growth in the same period, suggesting that the Commission continue its primary focus on manufacturing and other value-added development segments.
- 10) Data collection might be refined to include close-out information on actual private investment related to ARC-funded projects. In addition, ARC could explore with other federal, state, and local agencies how to devise better data collection methods for assessing the quality of jobs, the associated wage rates, and even the extent of part-time vs. full-time hours associated with these jobs.

Appendix A. Site Visit Narratives

Site visits were made to eight projects in five ARC locations encompassing the north, central, and southern segments of the Region. While the visits provided testimony as to the accuracy of project reports via paper and telephone, they also facilitated a broader sense of the impact and context of projects within the larger scope of an area's economy and development efforts.

The site visit reports are intended to provide additional context and color to a handful of verified projects. Site visits were intended to develop the type of background that is somewhat representative of the projects in the sample. Thus, the format of the site visit reports is designed as descriptive vignettes that attempt to bring the projects to life within their larger purpose.

Site visits included:

Bradford, McKean County, PA

- Bradford Area Multi-Tenant Center, #11398 (Industrial Park)
- Bradford Enterprise Development Center, #10828 (Business Incubator)

Olean, Cattaraugus County, NY

- Cattaraugus Economic Development Zone Infrastructure, #10621 (Access Road)
- Cattaraugus Incubator Phases I & II, #10564 (Business Incubator)

Greer/Gaffney, Greenville/Spartanburg/Cherokee Counties, SC

- BMW Sewer Improvement, #11163 (Water & Sewer)
- Prime Outlets Infrastructure, #12414 (Access Road)

Birmingham, Jefferson County, AL

- Birmingham Business Assistance Network (now Entrepreneurial Development Center) Tilman Levenson Building, #10751 (Business Incubator)

Bridgeport, Harrison County, WV

- Benedum Airport-Air Center Project, #10381 (Industrial Park)

Bradford Multi-Tenant Center #11398

Bradford, PA

Bradford Enterprise Center #10828

Bradford, PA

In the northern tier of McKean County near the New York border lies Bradford, a rugged traditional manufacturing center beset by difficult times. Over the years, the city has been hit by a series of dislocations, including downsizings at the Zippo lighter plant and the closure of the giant Pennzoil refinery. These are relatively recent events not reflected in the 1990-96 growth figures from County Business Patterns.



Bradford, PA, Multi-Tenant Center

For several years, Bradford and development efforts elsewhere in McKean County have struggled to focus resources on traditional core industries such as value-added wood products while looking for a means to expand the powder metals industry, vital to the rest of north central Pennsylvania, into the county. At the same time, Bradford's Redevelopment Authority has long identified the need to encourage entrepreneurial efforts in this county. The focus on entrepreneurial growth is both a diversification measure for an area traditionally dependent on dominant employers and a response to the start-up lag in the county. Whether as a function of unmet demand or development assistance or both, the area's start-up survival rate registers 25 percent above U.S. averages, and overall firm retention is 13 percent above. Still, Bradford is commonly recognized as a troubled center of unemployment and poverty within the more vital North Central Pennsylvania Local Delivery District.



The Multi-Tenant Center at Work

Within this context, the Bradford Multi-Tenant Center reflects an interesting cross-section of the area. Situated behind a residential area, this series of older buildings is home to the Redevelopment Authority as well as a series of local enterprises in wood products and other industries. As part of the ARC investment, the buildings are uniformly spruced up, with new windows, roofs, vents and plumbing. Painted exteriors yield a clean look to the gritty environment.

One tenant, a maker of redwood spas, busily measures out parking lot space for the erection of new production space; the existing buildings themselves are filled. There is obvious activity at another wood products firm and a maker of hunting equipment. Smaller back buildings are used for storage and distribution. Representatives of the Redevelopment Authority comment with obvious pleasure on the extensive levels of networking and equipment sharing among tenants involved in wood products manufacture—an industry with a regional reputation for secretive ways. Across town, a “lease” sign is attached to the standing incubator, but development officials proudly note that the “old” 40,000-sq.-ft. incubator, developed with ARC funds, is fully occupied. Two incubator tenants, a polymer-coating manufacturer and a maker of ferrite electronic modules, have grown into the entire space. The floors are stocked high with five-gallon containers of coating ready for shipment. An original incubator graduate moved out to larger space in the city accommodating the other, growing tenants.



Across the road from the ARC incubator, a new one rises to meet demand.

The lease sign itself advertises a building being erected 200 yards away, a new incubator necessitated by the lack of expansion space for graduates. The newest 35,000-sq.-ft. building is also being erected with ARC funding. The access road developed for the original incubator also serves the second, as well as a large Zippo lighter plant that supports 500 jobs. The access road also opened up property that previously could not be developed and that was recently sold to a private developer with a good track record for strip commercial development in the city. An adjacent playground, furnished by the city on property donated for use by Zippo, is also served.

Olean Road Access #10621

Olean, NY

Olean Multi-Tenant Center #10564

Olean, NY

Things don't look bad in downtown Olean. The area is a "winner" in the rural regionalization sweepstakes, with its economy anchored by half a dozen large, long-term manufacturers, including several Fortune 500 companies. Core firms include Dresser Rand, Dexter, Conap (specialty chemicals), Cooper Dale Tile (formerly American Olean), ABX Ceramics and Cutco/Elcast, a maker of specialty knives that carries on a historic regional tradition of fine cutlery producers.

To be sure, there are difficulties—a few vacant storefronts and persistent obstacles in the way of efforts to save historic buildings such as the downtown's old theater now being developed as a chain drug store. But overall, the downtown appears vibrant, boasting active commercial and office buildings at its older core and an aging but bright and bustling strip center at one edge of town. In line with developments in a number of well-placed rural towns in rural areas, Olean has developed into a regional commercial center attracting shoppers from a 50-mile radius. (A local development official notes that consumers come from as far as Bradford, PA, discussed above). New development adds to the feeling of vitality: Jamestown Community College is developing a permanent campus in the middle of downtown (a \$15 million-plus investment) and the Olean General Hospital is undergoing a \$30 million expansion.



The entire commercial corridor was made possible by the road.

The ARC investment in a critical access road, Constitution Street, opened opportunities for an entirely new commercial and multi-use district. Four parcels were developed by the Economic Development Zone (EDZ) as manufacturing, services, and professional space, while an entire strip commercial center was developed at an adjacent parcel. Other private development ensued along the road frontage. The remainder of the frontage is

owned by St. Bonaventure University, which anchors one end of the road. The University seems to have no current plans for development outside of a single hotel development. Efforts by the EDZ to create interest in other joint projects have not been fruitful.

At the end of the developed (Olean) portion of the ARC-financed road lies University Commerce Center, an EDZ-owned 12,500-sq.-ft. expandable building in need of rear paving (a Department of Housing and Urban Development application is in). The Center, so named by the EDZ as a friendly nod toward St. Bonaventure, is designed for larger, heavier industrial use. One of the tenants, Advanced Monolithic Ceramics, outgrew its original site at the Kirkpatrick Incubator. AMC now has 50 employees and is still expanding as a maker of ceramic capacitors. Paragon Foods, a macaroni packager, is a for-profit spin-off of a sheltered workshop. The ultimate build-out at the Commerce Center is projected at 30,000 sq. ft. The building is in nice shape, although its exterior was slightly damaged by a heavy ice storm last year.



The EDZ's University Commerce Center

The access road project also incorporated the Allegheny River Trail and a five-mile bike trail and stimulated an upgrade and extension of 28th Street, which now cuts across from downtown through a newly developed BJ's Warehouse Club to Constitution Street.

The Kirkpatrick Economic Development Center, an EDZ incubator funded by a separate ARC grant, is fully occupied. A lease for the only currently vacant module was recently signed. Space has turned over several times since construction, accounting for about 20 firms and 70 jobs. The incubator currently hosts a diverse mix of businesses: amusement rental, industrial supply, a camera shop, a maker of industrial hygiene products, a painting contractor, a cutlery manufacturer, and an adjacent day care center. Parking and tenant areas were recently upgraded with funds developed from a refinancing. Rents for 1500-sq.-ft. modules range from \$4 to \$8/sq. ft. Flex spaces are easily altered in the beamless building. Since the incubator was developed, so has property across the street,

now siting a credit union, a convenience store, and a gas station. Lots along the road are now being priced at up to \$100,000/acre.



The EDZ's Kirkpatrick Incubator is fully rented.

With a vigorous downtown and stable manufacturing base, the community appears positioned for future growth supported by a new middle school, an expanded regional hospital, and multiple institutions of higher learning that are investing in new development. Despite the success of the incubator in Olean, start-up rates remain low throughout Cattaraugus County (62 percent of the U.S. average), although start-up survival and overall retention rates are somewhat above average. By both government job growth measures and job replenishment rates alike, overall job growth appears sluggish, emphasizing the need for continued efforts to aid start-ups and expansions among existing firms.

Greenville-Spartanburg BMW Water/Sewer #11163
Greer, SC

Carolina Prime Outlets Access Road #12414
Gaffney, SC

Located in South Carolina's thriving upstate region, these two widely differing projects have each demonstrated a significant benefit to local economies. The BMW project in particular plays no small role in the boast of local developers that the upstate now accounts for about 30 percent of the annual new investment and job growth in South Carolina. Interestingly, both projects developed amid a note of controversy.



The BMW assembly plant

In 1992 when the BMW project was begun, the host county, Greenville, was designated as a competitive county and was eligible for only 30 percent funding by ARC. In 2000, Greenville county is considered an attainment county, while neighboring Spartanburg county is designated as a competitive county. The development of Greer's BMW has been an unquestionable boon to the entire metropolitan area. Currently employing about 2,000 in the production of BMW's Z sports model, the facility is in the process of building out capacity to gear up for production of BMW's sport utility vehicle, projected to increase employment by another 1,000. These figures do not include the large web of BMW suppliers and jobs spawned by the plant, which encourages suppliers to locate close to the mother site. Figures provided by BMW and the state indicate that the BMW "community" in South Carolina encompasses at least 33 major suppliers, including 22 that chose to locate new operations in South Carolina (two-thirds in the immediate area). BMW anticipates that at least five additional new firms will develop facilities in the state to service the sport utility vehicle (SUV) facility. According to BMW, its in-state suppliers have created about 2,500 jobs and pumped \$425 million into BMW-related facilities around the state. The state Office of Information estimates that the suppliers

support about 5,000 jobs overall. The supplier train extends through Georgia as well as North Carolina.

At the same time, the project—in which ARC invested only a portion of public funds and incentives—has come under criticism as an example of ARC expenditures which were too focused on a single large firm, and one which could afford fewer incentives at that. Several other external benefits accrued to the region:

- The Greenville-Spartanburg Jetport extended a runway to 11,000 feet in order to accommodate parts shipments for BMW—but the extension has also facilitated marketing the airport as a central cargo facility, resulting on ongoing negotiations with at least two major express carriers.
- The same water system improvements developed for the BMW project also serve the entire Greer area, including its 54 percent low-moderate income population (1990 census).
- Siting the BMW facility has, in the eyes of local development officials, played a significant role in generating further interest in the area among foreign investors. In 1991, for example, the upstate region hosted 60 international firms—today's figure stands at 116. Foreign firms are not only locating facilities at an impressive clip, but also investing in industrial land development activities. One business park in the area is wholly owned by German (non-BMW) development interests.



The BMW Visitor Center and Museum

The wealth and vitality generated by the project has sparked revitalization of long-dormant downtown areas in the two counties. Plans for a 56-acre executive conference and convention center build-out in Greenville are under way, largely driven by state and private resources. Demand from expansions and marketing efforts is so high that two new

business/industrial parks spanning 1,400 acres are under development, including a technology park. The latter effort aligns with the regional focus on further development of its technology cluster, including its existing textile-related chemical, industrial machinery manufacture and plastics sectors. These lower job-producing but high-value, high-wage industries reflect a regional effort to offset sporadic but ongoing dislocations in the basic textile industry, especially its clothing-related segments.

Part of the area's success appears to result from the close cooperation of regional development players, including several county-level Chambers of Commerce and the Public Works Commission of the bi-county city of Greer, which has invested over \$100 million in new infrastructure since 1992, yielding an ongoing spurt of new residential and commercial development. (The city considers applications for an average of ten new subdivisions per month.) All this translates into an unemployment rate that has hovered as low as the 2 percent range—even as the metro area's 340,000-person work force expands at a rate of 1.5 percent per year. The average manufacturing wage has climbed to over \$10.50/hour, about a third above mid-nineties levels. In response to expanding opportunities, the work force reflects considerable mobility and “churn,” with employees moving on to new jobs and better offers often enough to warrant comment from development officials.

In sum, job growth was higher than the U.S. average by 14 percent in 1990-96. Notably, despite the continuing advances in manufacturing, sector growth in the same period was only 1 percent—testament to advancing technology and, more ominously, the continuing decline of the area's historic textile base.

Near the end of this project, BMW announced yet another expansion—an investment of \$53 million during 2000 in an information technology center and parts warehouse. The 18,000-sq.-ft. info-tech center will house all of the plant's communications and data systems as well as services for video conferencing, Internet, intranet, and other communications. The 90,000-sq.-ft. warehouse will allow BMW workers to pre-assemble some parts before moving them into the plant. A conveyer belt will connect the new warehouse to the assembly line so parts will roll into the plant as needed.

Cherokee County Prime Outlet Center

At the other end of South Carolina's Upstate region, the ARC invested in a commercial project that the state itself wouldn't fund because of the retail nature of the businesses involved. Cherokee County Chamber officials (in Gaffney) and the Local Delivery District argued, however, that the access road and related improvements required for the proposed Carolina Prime Outlet Center would generate new wealth in this rural county that had yet to feel the impact of growth from the Spartanburg-Greenville axis. In fact, the Prime Outlets appear to have succeeded in reinventing Gaffney as a regional retail anchor, developing 80 new outlet stores and nearby supporting hotels and services where virtually no commerce had previously existed. The Outlets and related services today support about 700 jobs. A large-scale truck stop projected to employ 75 is under

construction. Most impressively, the outlet's 2.5 million annual customers are said to travel an average of more than 60 miles to Gaffney.



Cherokee County's Prime Outlet Center

A windshield survey of downtown Gaffney—about two miles from the Outlet site—suggested an aura of vitality, with only a handful of vacant storefronts, some undergoing rehabilitation. To move things along, a downtown improvement program is under way, funded by the state; Cherokee County's eligibility is based on its state classification as “under-developed” (the third-lowest of four possible designations). While the quality of jobs at the outlet are generally modest, the development—along with traditional anchor firms such as Nestles Frozen Foods, Temkin Bearings, and smaller mainstays in fiberglass, textiles, and feminine hygiene products—seems to have played a role in tiding over this rural county until the concentric impact of Greenville-Spartanburg widens. Just recently, development of a 380,000-sq.-ft. distribution facility was announced just inside the county line—a relocation from Greenville County and perhaps an omen of things to come.

Birmingham Entrepreneurial Center #10751

Birmingham, AL

It's a quick ride from the Pickwick Hotel, in the heart of Birmingham's restaurant district, to the Birmingham Entrepreneurial Center (BEC), a former retail building converted into Birmingham's premier incubator for service and manufacturing start-ups. The efforts of the incubator's leadership in the shadow of Birmingham's skyscrapers are a tale of two cities—one enormously successful, the other surviving on the margins.

The physical plant of the 30,000-sq.-ft. incubator itself is impressive, from the sunny, user-friendly design to the bright, energetic staff. Occupancy is virtually 100 percent except for space on temporary hold for an upcoming tenant expansion. Thirty companies are currently housed in the BEC building. BEC staff puts together an annual impact statement of the incubator, including continuing analysis of graduate sales. By their reckoning, annual impact of the facility's efforts has reached \$82 million in area sales, including \$39 million in direct sales revenue by tenants and former tenants. BEC staff is concerned that as graduates increase, these impacts become harder to track.



Birmingham Entrepreneurial Center

Despite strong economic growth in the Birmingham region, the BEC is experiencing continued and growing demand for space among qualified applicants who come in the door better prepared financially and with more realistic attitudes than in the BEC's early years. Staff reports a "higher yield" among the 60-80 applicants it now sees each year than was produced from the 140 or so it screened annually in the start-up phases of the incubator.

The wide range of support services offered by the BEC, including the development of web sites, mentoring and investor interest, appears key to its attraction among start-ups with real growth potential. An open house last year attracted five venture capital firms, not all of them local. Part of the pull seems to be the clusters around which much of the incubator's space has developed: software development (currently eight tenants) and

health care services (four tenants), including a pharmaceutical distribution firm that recently received a \$3 million equity infusion, a connection facilitated by BEC staff. While not limited to these or other industry-specific efforts, the incubator does actively seek tenants with significant growth opportunities that it will be able to graduate in 3 to 5 years.

The increasing number of qualified applicants and the desire to relocate graduates in the same core city area have combined to increase the BEC's determination to secure additional space. The search is actively under way, and discussions are in progress for a number of sites ranging from 10,000 to 50,000 sq.-ft. A trashed-up land parcel adjacent to the existing incubator is also being considered. As discussed in greater detail below, efforts to secure this and all nearby sites are significantly impeded by land speculation in the area.



Tenant module at the Birmingham Entrepreneurial Center

The BEC's four full-time staff members work with a budget of \$600,000, which is 75 percent self-supporting. The Economic Development Partnership of Alabama is a major contributor. Full self-sufficiency is planned within a couple of years. The incubator has won considerable local and national recognition, including the award of three Price-Waterhouse Tenant and Graduate of the Year prizes, and boasts two African-American graduates recognized as Birmingham Small Businessperson of the Year. The incubator is used as a model for several visiting facilities: The consultant team's site visit was scheduled just before a visit from two Florida incubators.

The other side of the story concerns the BEC's indirect role—not among tenants, but as a hoped-for community development catalyst.

Like most metropolitan areas, Birmingham is beset with demographic and economic contrasts. The metro area's 70-30 white-black population ratio is reversed inside this city of 270,000 (metro area 1 million). In contrast to a vibrant downtown core and increasing numbers of suburban commuters, the edges of downtown continue to display all the symptoms of long-term blight: vacant buildings and blocks, trash-strewn lots, and a handful of aged for-sale signs. It is in this latter area that the BEC chose to locate.

From the beginning, the BEC (then the Birmingham Assistance Network or BAN) measured its progress on a dual track—as a traditional incubator serving its direct tenant base and other entrepreneur clients, and as a community development vehicle for this outlying portion of downtown.

Downtown development efforts appear to have had a tougher time than in many similar cities, in part because there is a very limited history of any substantial residential population in the immediate downtown area. Efforts in the commercial core, buoyed by University of Alabama acquisitions (the university now owns 96 blocks of the downtown area), have been energetic and the subject of much concentrated attention. The core of the city center is also kept vital by a large hospital complex and Birmingham's role as the second largest banking center in the South.

However, a development vacuum continues to dominate the landscape on the south side of the city, home to the BEC, which had hoped ten years ago that its location would spur other activity in this slice of the downtown. Instead, private landholders have largely sat on their deteriorating properties, waiting to cash in on a boom to come. Although the city has actively annexed property to expand its jurisdiction over the past 20 years (to positive economic effect), there seems to be no such corresponding aggressive movement to encourage the development process in the BEC section of the old city.

The BEC continues to see a dual role for itself that includes that of development catalyst, but it is having difficulty finding parties with which to negotiate over property, much less come to realistic terms. BEC leadership is looking to ARC for further investment to extend its mission and impact, and on the face of it, the incubator's success certainly warrants a positive response. At the same time, a difficult and open question remains as to whether ARC policy should push development of an area that local and state officials have the resources, but not the will, to pursue. Of course, this is only an issue insofar as the community development aspect—clearly a secondary one—is considered in any future BEC application. As for the incubator itself, success appears to be breeding success, and future investment should continue to pay off handsomely. It is clear that the BEC's direct tenant support activities, mentoring, and nurturing of non-tenant entrepreneurs have contributed to Jefferson County's start-up activity rating—a full 20 percent above the national average.

Benedum Airport Infrastructure #10381
Bridgeport, WV (Harrison County)

Flying low over the mountains of north central West Virginia in a small Beechcraft, the Benedum Airport is at first hard to discern from other rural airports. The runway is longer than most, the outbuildings larger and more numerous—but not much stands out. Inside the terminal, the feeling of low-level activity is reinforced: baggage handling is manual, and the single paste-up schedule board announces only 17 daily flights—8 in, 9 out.

An auto tour quickly dispels the notion of a sleepy airport complex. Straddling the airport's lengthy runway are facilities housing giants of the aerospace industry—Pratt & Whitney, Bombardier and Northrop Grumman. The aerospace facilities, all engaged in non-competitive maintenance, overhaul, and repair of commercial and military vehicles, have blasted past projections made in 1989 when the ARC was asked to invest in a new runway required for the Bombardier facility. Since then, 200 projected jobs have become 600 with more on the way. The pre-existing Pratt & Whitney facility, which routinely invests \$2 million annually in its facility, is completing an additional \$7 million expansion to accommodate a new \$300 million corporate jet overhaul contract and is looking to build an additional hangar to attract heavy overhaul businesses from the corporate jet segment of its market. An ARC application has been developed to assist in this effort.



Benedum Airport now hosts an impressive aerospace complex.

A battery of large earth-moving vehicles works industriously to the east of the runway. These are army guardsmen, attached to the Fixed Wing Training unit sited at Benedum. An Army representative estimates that \$25-\$30 million has been contributed in earth-moving work for the airport complex. And noteworthy work it is. The Army training unit

schools its charges by literally moving mountains. Its first task was to step into the runway extension program when Federal Aviation Administration funding fell short, creating the earth infrastructure for the runway. It continued working on airport projects and is now in the process of whittling a 1,450-foot mountain down to 1,200 feet, using the fill to level out the valleys surrounding the airport to create new industrial sites.



The Army is literally moving a mountain to create new sites for cluster growth.

When three envisioned phases are completed by 2005, the airport's development arm, the Mid-Atlantic Aerospace Center (MAAC), will be the owner of more than 200 acres of prime industrial property served by all utilities, a taxiway to all sites and a straight four-lane access road to I-79 less than three miles away. The MAAC is gearing up for a marketing effort for acreage coming on line, and, toward that end, is engaged in the development of a Foreign Trade Zone designation for the site.

The original motivating firm for ARC project was Short Brothers, an aerospace overhauler. That firm has since been bought by Bombardier, which remains an important player—but only one of many—in what appears to be the successful nurturing of a core regional industrial cluster. The current cluster picture is rounded out by the location of two important non-profit players on airport property: the Byrd National Aerospace Educational Center, which provides skilled workers to aerospace firms on and off site, and more recently, the Byrd Institute of Flexible Manufacturing, which chose Benedum as a growing center of technology-based firms.

In the mid-1980s, local development officials identified an opportunity to develop a one-stop aerospace center serving the East Coast and the mid-Atlantic region in particular.

The vision was prescient, as industry consolidation pushed vehicle owners toward just that solution. Officials of private firms in the complex remain delighted with the vision, which they profess has helped them enormously—as well as by local and congressional cooperation and encouragement of the effort.

It's not a stretch to conclude that the outstanding growth of this area (52 percent above the U.S. average in 1990-96), the maintenance of manufacturing levels in the face of huge dislocations in traditional industries, and high levels of firm retention (104) and job creation among surviving firms (109) are not at least in part a result of this effort. While the area has clearly benefited from the development of a large 2,000-job FBI facility as well, these job figures were not included in the economic analyses, which cover only the private sector.

Next on the agenda for the aerospace complex is the development of a four-lane access road direct to I-79. The Army Guard has already prepared the airport roadbed, and the state highway department has budgeted funds for the connector, which will bring I-79 within three miles of the airport and its aerospace complex. In addition to enhancing existing and proposed industrial sites at Benedum, the connector will ease serious traffic congestion that has developed in and around Bridgeport as a result of overall growth.

Some innovation centers funded as incubator projects have supported thousands of new and existing jobs through technology-intensive and deep technical and networking services.

Appendix B. Methodology: Infrastructure and Public Works Project Selection

The 99 projects analyzed for this report were selected from files representing 1,544 ARC investments in the Infrastructure and Public Works Program between 1990 and 1997. The project scope called for the selection and assessment of approximately 100 projects that would offer the representative picture of ARC investment, and especially projects with an economic development focus. The original project universe in the ARC's files included

- 69 access road projects (17 closed)
- 410 water projects (186 closed)
- 267 sewer projects (111 closed)
- 478 water and sewer projects (222 closed)
- 123 industrial park projects (37 closed)
- 29 incubator projects (18 closed)
- 168 miscellaneous projects

Most notably, the number of total water and sewer projects developed in 1990-97 (1,155 total, 591 closed) dominates the investment and the ultimate number (51) used for this assessment. The original numbers were pared down to focus on economic-development-related projects and to ensure reasonable representation of project types, geographic distribution and strategic focus. Some categories were excluded or modestly sampled because of declining strategic interest of many states (e.g., downtown revitalization), while others had complex, multiple objectives (such as telecommunications and distance learning). Finally, others posed difficult evaluation problems and increased the complexity and cost of the research (e.g., solid waste projects and public safety).

Goal 2 projects (infrastructure and public works) that were excluded from the evaluation for these and a variety of other reasons included 13 downtown revitalization projects, 31 solid waste projects, 20 community facility projects, 52 telecommunications and distance learning projects, 22 housing projects, 12 rail spur projects, 12 public service projects (principally fire safety), 6 recycling projects, and a couple dozen odds and ends.

Excluding the odds and ends (such as technical planning grants and a few gas lines), the other categories would have added 168 projects to the 1,376 projects which fell into the four basic categories for a grand total of 1,544 projects (both open and closed). Thus, roughly 1,500 projects received ARC investments under the Infrastructure and Public Works Program during the 1990-97 period.

The process of narrowing the original universe to the target of 100 projects included the following steps:

- Only closed projects were considered, narrowing the universe to 663 potential projects.

- Due to the large number of Water and Sewer projects (1,155 total, 591 closed), only projects of these types that began in 1992 were considered.
- To the extent possible, water and sewer projects that envisioned economic development impacts received priority.
- Attempts were made to ensure enough representation from all project classifications (industrial parks, access road, incubator) to ensure a robust assessment of each type.
- Efforts were made to ensure geographical representation from all states in the ARC Region.

This process left 115-120 project names and numbers. No “lead” information existed for several; that is, ARC data sheets were not received for them. After validating discussion with interviewees, a number of multi-phase projects were combined for database purposes. For example, an incubator project that received two rounds of ARC investment was considered as a single project for analysis purposes.

This process left 104 separate projects in the database for analysis. Original documentation was reviewed and interviews conducted for each. Multiple interviews were conducted for most. Each of the counties in which projects were developed was subjected to a variety of economic trend, vitality, and impact measurements. Project participants were, on the whole, rather forthcoming, assisting the analysis process immensely.

Of the 104 projects from the original database, 99 were confirmed as implemented and suitable for evaluation. One (#11808, the Clough Pike Industrial Corridor Access Road in Clermont County, Ohio) remains in the design stages and was excluded from analysis. A second (#10530, South Carolina’s Clemson Technology Incubator) was excluded in an attempt to align “apples and apples” for this evaluation; the project was the only one in the database that had no bricks-and-mortar objective or outcome. Three were discarded because of non-implementation.

- One industrial project (#10858; Harrison, VA) lost the prospect for which it was developed.
- One water project (#11029; Burke, NC) was not implemented because the applicant did not have the water capacity to supply the envisioned new system.
- One sewer project (#11017; Chautauqua, NY) became unnecessary because of a regional sewer system consolidation.

Of the total of 99 projects analyzed, 87 reflected objectives and outcomes directly related to economic development, while the remainder were residential water or sewer projects that related to quality-of-life objectives. Thirty-nine water and sewer projects were directly related to economic development, by design or outcome or both. Some water and sewer projects were integral pieces of economic development efforts—for example, sewer lines on which industrial location were contingent—while others had more secondary economic development purposes. The 99 utilized projects were distributed in these classifications:

- 51 water/sewer projects
- 22 industrial parks
- 11 business incubators
- 15 access roads

In sum, the available projects ultimately selected for assessment in this report are represented in the following table:

Project Type	Sample Years	Total '90-97	Total Closed	Sample Size
Access Roads	1990-97	69	17	15
Industrial Parks/Site	1990-97	123	37	22
Incubators	1990-97	29	18	11
Water/Sewer	1992	1,155	591	51
Total		1,376	663	99

Appendix C. Methodology: Impact Analysis

Comparison with Other Studies

Types of Studies. There are two major types of program impact or evaluation studies for economic development programs focusing on infrastructure and public works investments:

- ***Statistical estimates of net economic changes.*** This type of study measures pre/post changes in economic activity (employment, sales, and/or income) in the affected area. Usually there is some attempt to estimate net impacts from the observed (gross) changes by controlling for other (exogenous) factors affecting the local economy during that period. This is typically accomplished through comparison of changes in the affected counties to some “control group” of other roughly similar counties that received no such funding. A series of statistical analyses are then used to control for underlying changes in economic trends over the study periods and to determine if the intervention had a measurable effect. This type of analysis alone can provide estimates of net change over time in the project areas. However, such methods cannot establish causality, or how the implementation of projects actually interacted with other local economic activities and economic development efforts to affect the results for local communities.
- ***Program performance (case study) evaluations.*** This type of study focuses on documentation of how individual and entire sets of funded projects succeeded in affecting local economic activity. Usually such studies examine how the funded projects led to changes in local land development, private investment, mix of business and jobs, and levels of taxes. This study is typically accomplished through case study interviews (covering local private sector and public sector participants and observers), together with review of available local documents. This type of analysis can provide much insight into the causal effects of projects and how project implementation actually interacted with other local economic activities and economic development efforts to affect local communities. However, it focuses primarily on actual observed results and not on the estimation of how local economies might otherwise have changed under hypothetical situations in which the projects never occurred. As such, this type of analysis is most useful for evaluating program performance and identifying how it might be improved in the future.

This study most closely resembles the latter class of studies, which includes the Economic Development Administration’s (EDA) public works evaluation *EDA Public Works Program: Performance Evaluation* (Rutgers, NJIT, Columbia, Princeton, NARC, and Univ. of Cincinnati: May 1997). For that reason, there is particular interest in the similarities and differences between this ARC study and that earlier EDA study.

Direct, Indirect, and Induced Economic Impacts

Regardless of whether economic impacts are measured in terms of jobs, income, or business sales, these impacts can be classified into three categories:

- ***Direct economic effects*** are the changes occurring at the project site as a direct consequence of the public investment, project, or program. This is represented as the net increase in business activity associated with new relocations of business to the project site, expansion of existing businesses at that site, or new business start-ups there.
- ***Indirect economic effects*** are the broader effects on business activity for off-site suppliers to the directly affected businesses. This can include production, distribution, and transportation for suppliers of goods and services.
- ***Induced economic effects*** are further shifts in spending on food, clothing, shelter, and other consumer goods and services, as a consequence of the change in workers and payroll of directly and indirectly affected businesses.

The “direct effects” are measured through monitoring of program outcomes and local site interviews. The “indirect” and “induced” business impacts are often referred to as “multiplier effects.” These multiplier effects are estimated through input-output (I-O) economic models that are calibrated for each local county. The I-O models incorporate inter-industry purchase/sales patterns (reflecting prevailing industry structures and technologies) and estimates of the extent to which local suppliers provide various products and services.

When a project leads to direct increases in jobs and income, the multipliers indicate the corresponding indirect and induced increases in jobs and income. These additional effects do represent real net gains in local business activity (jobs and income) as long as the area is able provide additional workers for the new jobs without shifting workers away from other existing economic activities. This assumption is generally reasonable when the study area is a county with above-average unemployment. That is indeed the situation for these distressed and transitional counties within the Appalachian Region.

To estimate the indirect and induced (“multiplier”) economic effects for each project, this study used the IMPLAN model system. IMPLAN, which stands for “Impact Analysis for Planning,” is now the most widely used input-output economic modeling system in the United States, with a client list of 500 public and private agencies including several federal agencies and numerous state agencies. It utilizes U.S. Commerce Department (“National Income and Product Accounts”) data on inter-industry technology relationships (also known as input-output structural matrices), countywide employment and income data from the Bureau of Economic Analysis (BEA) and Bureau of Labor Statistics (BLS), and its own industry and county-specific estimates of local purchasing rates (“regional purchase coefficients”). It is enhanced over most other input-output

models in that it also includes coverage of public sector activity and consumer activity (reflected in its “social accounting matrix”). The industry detail is at the level of 528 industries and is based on categories of the BEA that correspond to 3- and 4-digit groups in the Standard Industrial Classification (SIC) system.

For this study, the direct job and income effects on business attraction, location, and retention in the local counties were documented and then assigned to specific SIC groups, based on information from interviews with local public and private sector representatives. The IMPLAN model was then calibrated for each local county, and run given the direct effects on specific SIC groups in each of those counties. The result was an estimate of the indirect and induced (and overall) job and income impacts for each project on its own local county.

Fiscal Impacts

Changes in government revenues and expenditures are referred to as “fiscal impacts.” They can result from economic impacts (direct, indirect, or induced effects on employment, income, and business sales), as well as demographic impacts (changes in birth, death, or migration rates). If it is assumed that these commercial and industrial projects primarily create jobs and enhance incomes for existing residents of economically-depressed counties and do not attract major in-migration into these areas, then there will be relatively little change in government expenditures (for schools, public safety, local services, etc.). However, the additional business activity and income can lead to significant impacts on local sales and property tax receipts, as well as potential impacts on state sales, income, and business tax receipts.

For this study, estimates were made of the impact on personal income, sales, and property tax revenues. The following methods were used:

- To estimate state **income tax** revenues, information was collected from each state’s revenue department on total state income tax revenues, average tax rate and average taxable portion of total personal income. This was compared with the BEA data on total personal income by state, and ratios were calculated indicating the relationship between total state income tax revenues and total state personal income. These ratios were then applied to provide approximate estimates for the change in state income tax revenues resulting from project impacts on personal income from new jobs (including direct, indirect, and induced effects).
- To estimate state and local **sales tax** revenues, information was collected from each state’s revenue department and from each county on the applicable sales tax rate, as well as the average taxable portion of total retail sales. Additional information was collected from the BEA on total retail sales as a portion of personal income by state, and ratios were calculated indicating the relationship between total state sales tax revenues and total state personal income. These

ratios were then applied to provide approximate estimates for the change in state and local sales tax revenues resulting from project impacts on personal income and corresponding retail sales levels.

- To estimate local (county and municipal) **property tax** revenues, information was collected from each county (and/or from the state revenue department) on the applicable local property tax rates for commercial property. These rates were then applied to the reported level of private sector investment associated with each project (which in theory should also be reflected in increased property values). In many cases, the local interviews did provide information on the level of property tax revenue resulting from the private investment and enhanced property values. Often, the reported actual figure and the estimated one were roughly comparable. However, in some cases, the local interviews indicated that partial or total property tax exemptions were made for investments in the project areas. In all cases where there was a difference, the interview-reported tax-revenue figure took precedence over the estimate.

No estimates were made of the impact on corporate taxes because of the nature of specific differences in profitability, deductions, and write-offs among specific businesses.

Difference from Traditional Benefit/Cost Analysis. This analysis is designed to provide insight into the types and magnitudes of impacts occurring as a result of the ARC funding of infrastructure and public works projects. It does not provide traditional benefit/cost ratios, reflecting the economic efficiency or pay-back from public investments. Such an approach is *not* appropriate here, for several reasons:

- **Purpose.** A basic purpose of the ARC programs has been to address an issue of inter-regional “equity” in terms of economic opportunities and living conditions among parts of the United States, and not just to maximize “efficiency” in terms of national return on investment.
- **Benefits.** The projects funded by these programs are intended to represent not just increases in personal income for residents of economically depressed areas, but also creation of new jobs and expanded job opportunities in local areas of relatively high unemployment. These projects can also serve to reduce dependence on public assistance, increase quality of life, improve local community functions, and enhance health. Some of these latter types of benefits are discussed in project case study narratives, rather than in the summary counts of job and income changes.
- **Time streams of effects.** The public *costs* of these projects are one-time capital investments, which come from existing federal, state, and local government budgets that are predominantly earmarked for economic development programs. The public investments and matching private sector investments are measured in this study. The *benefits* of these programs, on the other hand, are streams of income (and community

quality-of-life improvements) which may continue for many years. Since all of the projects studied here were completed within recent years, only the current *annual* impact is shown in this report. The full benefit, though, is the continuing stream of benefits over time. It is not possible to accurately represent the current value of that benefit stream, since we have no reliable basis for estimating how new businesses will subsequently grow or decline over time.

- ***Focus on understanding roles of ARC investments.*** A focus of this study was on the collection of information from local public sector and private sector representatives regarding the nature of local outcomes from ARC public works expenditures—how the ARC investments helped leverage other public and private sector investments; helped to make possible increases in local job opportunities and income; and caused other intended or unintended local impacts. This study was seen as providing useful insight for improving program design and application in the future. The study was designed to avoid speculative projections (such as how employment at the project sites will grow in the future), estimation of hypothetical situations (such as how the county economies would have been different if these projects had not been implemented), or assignment of relative credit for program success (such as whether the ARC funding was more critical than other public funding sources in allowing project implementation).

For all of these reasons, it was neither possible nor desirable to engage in estimation of life-cycle costing, discounted present values of future benefits, or attribution of relative credit for net impacts. The impact measures shown in this report are thus intended to represent *indicators* of relative program impacts rather than strict economic efficiency ratios.

Comparison with the EDA Public Works Program Performance Evaluation

This ARC study was defined primarily to meet ARC's particular needs for program evaluation and thus included both similarities and differences from the EDA study, which actually predates this study by nearly three years. The following is a summary comparison of the two reports.

Programs. The EDA Public Works Program has some similarities with, and differences from, the ARC Infrastructure and Public Works Program. They are superficially similar in that both provide grants for access roads, sewer, water, and industrial park facilities. Both focus on economically depressed counties, though the EDA program is national while the ARC program focuses on the unique and long-suffering Appalachian Region. The EDA program also includes funding for harbors/ports and vocational/technical schools, which are not covered in the ARC program. The EDA program focuses on job creation, while the ARC program focuses on both job creation (commercial and industrial development) and public health (through residential water and sewer projects). Both programs require a “but for” justification—that is, they are intended to meet a funding gap by covering only a portion of total project costs and requiring that other public and

private funds make up the difference. However, the ARC program also requires that another federal agency (typically EDA, HUD, or USDA) also provide economic development funding and overall project administration.

Evaluation Approach. The EDA study and this ARC study have some similarities:

- ***Approach.*** Both used a large number of case studies.
- ***Measures of local area distress.*** Both reported some measures of local area distress.
- ***Measures of direct economic effects.*** Both monitored the estimated vs. actual levels of direct public and private investment and direct job creation/retention.
- ***Measures of indirect and induced economic effects.*** Both estimated subsequent impacts on indirect and induced jobs, using input-output multipliers derived from IMPLAN models for each specific county.
- ***Measures of tax impacts.*** Both estimated effects on the local property tax base (based on private sector investments).
- ***Benefit and cost indicators.*** Both estimated ratios of total jobs created per dollar of spending by the specific program and per total public investment.

However, there are also some significant differences:

- ***Measures of local area distress.*** The EDA study measured local area distress in terms of published labor force and socioeconomic characteristics, including both city and county data. This ARC study examined local distress in terms of a broader set of business trends for the affected counties, including changes in ARC distress ratings over time, changes in ratings of economic concentration and diversification, and indicators of business growth/decline trends and economic vitality trends (including indicators of entrepreneurial start-up and survival rates and business retention rates).
- ***Measures of direct economic effects.*** The EDA study measured direct project effects in terms of temporary construction jobs, permanent jobs and investments (including public and private investments directly associated with the projects and leveraged as a consequence of the projects). This ARC study focused specifically on the economic benefits of the completed projects and thus did not cover temporary construction jobs. It did, however, also cover permanent jobs and investments made, and also measured direct effects on increasing local wage income. It also included qualitative assessments of individual project effects on economic diversification.
- ***Measures of indirect and induced economic effects.*** The EDA study applied IMPLAN models for each affected county but calculated and applied all-sector average employment multipliers since it lacked information on the SIC codes of the directly affected businesses. These models were used to estimate indirect and induced economic effects associated with retained (saved) jobs as well as new jobs. This ARC study also applied IMPLAN models for each affected county, but

it calculated and applied separate income multipliers as well as employment multipliers, and estimated those multipliers for specific SIC codes corresponding to each project (whenever possible). It also took the more conservative approach of applying the multipliers to estimate indirect and induced effects only in connection with the newly created local jobs and not for the retained (saved) local jobs (where the actual loss is less certain).

- ***Measures of tax impacts.*** The EDA study estimated the addition to the local property tax base to be the same as the level of private sector investment. This ARC study investigated the local property assessment rate (as a percentage of total valuation) and the extent of temporary or partial abatements in order to refine the estimates of actual change in local property tax base. Local property tax impacts were then calculated, based on a combination of local government sources regarding either actual tax collections or actual property tax rates and estimated valuations. In addition, this ARC study also estimated impacts on local and state sales taxes and income taxes, based on applicable local tax rates and estimates of changes in income and taxable retail spending.
- ***Other measures of program impacts.*** The EDA study included a statistical analysis of EDA and non-EDA counties, in which regression equations were estimated to determine whether there was a statistically significant relationship between EDA spending in a county and countywide growth in employment and income. That study found that there was indeed a positive relationship, though it could not distinguish between the impact of the EDA dollars and the impact of other public and private dollars that were invested at the same time. This ARC study did not include any such statistical analysis but did include qualitative analyses of project impacts on reuse of vacant/underutilized sites, support for speculative building development, support for industry clusters, effects on land use patterns and environmental quality, and perceived quality of life.
- ***Benefit and cost indicators.*** Most of the EDA study results were presented in terms of ratios of jobs and private investment per million dollars of EDA funding (although the effect on total jobs per million dollars of total project investment was also calculated). This ARC study, on the other hand, presented results in terms of the ratios of jobs, income, and private investment per ARC dollar and per total public dollar spent. It explicitly avoided allocating all of the credit for project benefits to ARC or any other single funding source, even if that funding source was necessary to make the entire project possible.

Findings. The EDA study and this ARC study provided largely different measures of program success. Few of the reported impact measures were comparable. One exception is the ratio of total public cost per directly created permanent job. That cost was \$4,857 in the EDA study and \$4,574 in this ARC study. These two numbers are roughly equivalent, suggesting that similar levels of economic impact were resulting per dollar of public works spending from both programs. The comparisons of total economic impacts per dollar of specific EDA or ARC program spending is largely meaningless, since it assumes that all of the credit goes to the specific program and none to the rest of the public expenditures from other programs. If the comparison is done, though, the result is

a ratio of \$3,058 EDA dollars or \$1,222 ARC dollars per directly created permanent job. This difference almost completely results from the fact that EDA spending accounted for nearly two-thirds of the total *public spending* on its projects, while the ARC spending accounted for just one-fourth of the total *public spending* on its projects. It thus reflects the different roles of the two project funding sources rather than any differences in program effectiveness.

Appendix D. Methodology: Economic Vitality Analysis

Each segment of the four economic vitality analyses was developed through a variation of the Firm Life methodology. This form of longitudinal analysis is developed with the use of 12 to 16 different private sector credit-reporting databases.

Most economic analysis looks at changes in a total area over time. For example, most publicly available government data may compare how many firms operated in an area three years ago and then at some earlier point. The difference between the snapshots is represented as an area growth pattern. But the analysis offers no way of understanding the experience of individual firms or groups of firms—how many survive, die, grow, or decline.

The Firm Life analysis fills this critical gap. The methodology takes 1996 “pictures” of the U.S. economy and each local project area, then breaks out firms in a variety of categories. The progress of each group of firms is tracked by area and industry over time.

The vitality analyses demonstrate what happened to those original firms during the period under review: how many started, survived, or failed. The Firm Life analysis can compare local and national success rates, start rates, and growth patterns of survivors in any industry and any area. The national databases used for comparison is composed of information on almost 15 million firms.

Four measures were included in the vitality analysis:

- Entrepreneurial Activity, as measured by start-up rates across the United States and in each project area. Unduplicated firms reporting less than one year of operation were summed through the databases for three years. The totals were compared with all firms in the most current database for the United States and each project area, reduced by the number of firms for which age information was unknown. The results of each local area were benchmarked against U.S. totals where U.S. equals 100.
- Entrepreneurial Survival rates were developed for each project area. Because of the small number of start-up operations (less than one year of operation by 1996) in many project areas, the analysis was developed for firms reporting 0-3 years of operation in 1996. This subset was developed for the United States and all 76 project areas. The 77 groups of firms were then tracked for three years through 1999 and survivors identified. The percentage of surviving young firms in each area was then benchmarked against U.S. patterns where U.S. equals 100.

Along with the Entrepreneurial Activity rate, the resulting Entrepreneurial Survival rate creates a quantifiable measure of entrepreneurial vitality in each project area.

- The methodology of the Firm Retention Rate corresponds to the Entrepreneurial Survival rate. However, instead of the 0-3 year subset, all firms across the United States and within each project area were tracked through the 1996-99 period. Once

again, survivors were identified and the percentage of surviving young firms in each area was benchmarked against U.S. patterns where U.S. equals 100.

- The findings of the Firm Retention rate are supplemented by incorporating Job Replenishment analysis, which compares the number of jobs lost by failed firms in the firm retention analysis with those added by survivors over the same period. The Job Replenishment analysis deliberately excludes business in-migrants and start-up operations after 1996 from calculations. The result is a “pure” view of the growth and vitality of surviving firms—the bedrock of most economies. The Replenishment Rate also serves as an important supplement to the Firm Retention Rate, which can reflect high scores in areas with relatively stagnant economies as well as those that create conditions for retention and growth. In general, high Retention and Replenishment rates together signal economic vibrancy even in areas that are not business migration leaders or “hot spots” for start-up activity.

Appendix E. Methodology: Distressed County Analysis

Distress designations are an integrated barometer of economic well-being maintained by the ARC. Every year the Commission determines the economic status of the 406 counties in the Appalachian Region, with each county assigned to one of four economic categories: distressed, transitional, competitive, and attainment. The designations are based on three economic measures that are benchmarked to national averages for the poverty rate, three-year average unemployment rate, and per capita market income (i.e., per capita income less transfer payments). Distressed counties are eligible for additional funding and lower matching requirements (20 percent), with matching funds requirements rising for transitional (50 percent) and competitive counties (80 percent), and with attainment being deemed ineligible for funding.

Project counties' economic status was evaluated for the sample and compared with the distribution for the Appalachian Region as a whole. In general the sample set of project counties was found to be representative of ARC's distress rankings for 399 of the 406 counties based on FY1988 designations. The four-level designation system was implemented only as of FY1997, so the application of these categories to FY1988 data is really a retrospective projection of the criteria.

As a matter of ARC policy, no projects were developed in "attainment" counties. Thus, only competitive county projects are missing from this sample. Project impacts on distressed areas are discussed more fully below.

To recap, distress rankings were analyzed for 399 of the 406 counties contained in an historical database provided by the ARC. Base year designations (FY1988) were compared with current year (FY2000).

- Of the 399 counties in Appalachia as of 1988, 90 (23 percent) were distressed, 289 (72 percent) transitional, 16 (4 percent) competitive, and 4 (1 percent) attainment. Seven counties that were not designated as ARC counties in 1988 were excluded from this analysis.
- By contrast, among the 76 project counties, 18 (24 percent) were distressed in 1988 and 57 (75 percent) were transitional. Only one was competitive, and none were in the attainment category. In other words, the concentration of distress was only slightly more severe in project counties than in non-project areas. To use the ARC's scale of 1-4 distress designations (one being distressed), non-project counties had a 1988 average distress designation of 1.83, while project counties had an average distress rate of 1.8.
- By FY2000, the distress concentration of the two groups was virtually even (1.84 for the non-project area and 1.82 for project counties—a 1 percent differential). The total ARC group of counties had improved its rating 0.01 or about one-half of 1 percent, while the project group improved its average rating by 0.06 or about 3.4 percent.

	All ARC Counties		Project Counties	
	FY1988	FY2000	FY1988	FY2000
distressed	90	107	18	19
transitional	289	260	57	50
competitive	16	22	1	6
attainment	4	10	0	1
total	399	399	76	76

A separate analysis traced the progress of the most distressed ARC counties in both the non-project and project groups. Of the 90 ARC counties that were in the distressed category in 1988, 22 (24 percent) moved up to the transitional category by FY2000. In rating terms, the 1.00 1988 designation of this group improved to 1.24.

	1988 Distressed ARC Counties		1988 Distressed Project Counties	
	FY1988	FY2000	FY1988	FY2000
distressed	90	68	18	12
transitional		22		6
competitive		0		0
attainment		0		0
total	90	90	18	18

Among the project counties, 18 were distressed in 1988, approximately the same proportion as in all ARC counties. By FY2000, six of these improved their ratings to transitional, improving the project group's average from 1.00 to 1.33.

While a direct causal relationship should not be imputed, the most distressed project counties clearly improved at a greater rate than did distressed non-project counties. Another analysis traced the progress of ARC counties that were deemed transitional in FY1988 in both the non-project and project groups. Of the 289 ARC counties that were in the transitional category in 1988, 39 (13 percent) dropped to distressed, 232 (80 percent) remained transitional, 14 (5 percent) moved into competitive, and 4 (1 percent) to attainment rankings by FY2000. In rating terms, the 2.00 1988 designation of this group dropped to 1.94.

	1988 Transitional ARC Counties		1988 Transitional Project Counties	
	FY1988	FY2000	FY1988	FY2000
distressed		39		8
transitional	289	232	58	44
competitive		14		6
attainment		4		0
total	289	289	58	58

Among the project counties, 58 were transitional in 1988. By FY2000, 8 of these had dropped to distressed, 44 maintained transitional rankings, and 6 improved their ratings to competitive. The overall rate of the project group decreased from 2.00 to 1.97. While the project county group declined overall, the drop was slightly less than the one identified among the all-ARC group of transitional counties.

Figures for counties that began in the competitive and attainment categories are as follows (only one in the project group was in these categories):

	All ARC Counties			
	Competitive FY1988		Attainment FY2000	
	FY1988	FY2000	FY1988	FY2000
distressed		0		0
transitional		6		0
competitive	16	5		3
attainment		5	4	1
total	16	16	4	4

In the case of counties starting out as either distressed or transitional, it is worth stressing that no causal relationship can be ascertained. At the same time, it seems indisputable that those counties that began with lower distress designations and received project assistance performed better over the 12-year period than those that did not. It could be that the projects had a substantial impact in this differential, and it is clear from the interview process that ARC-assisted projects were a major factor in some cases. It also seems to be the case that project applications emanate from—and may be approved for—counties that are experiencing or anticipating growth opportunities. But in this case as well, the ability to recognize and fund such opportunities is worth recognizing.

Appendix F. Project List

Project ID	State	County	Start Year	Project Name
10756	AL	Bibb	1991	Harrisburg Water System Improvements
10817	AL	Blount / St. Clair	1991	Blount Mountain Water Extension
10488	AL	Cullman	1990	Hanceville Industrial Park
10572	AL	Cullman	1990	Cullman Infrastructure Improvements
10988	AL	Jefferson	1992	Kings Point Water Line Extension
10751	AL	Jefferson	1991	Birmingham BAN Tilman Levenson Building
10978	AL	Lauderdale	1992	Florence-Lauderdale County Port Development
9994	AL	Madison	1988	Huntsville Industrial Park Improvements
10997	AL	Walker	1992	Parrish Sewer Line Extension
10758	AL	Walker	1991	Eldridge Water Service Extension
10757	AL	Walker	1991	Nauvoo Water System Improvements
10489	AL	Winston	1992	Arley Water System Improvements
10993	GA	Gilmer	1993	Ellijay-Gilmer County Water Line
10800	GA	Habersham	1995	Clarkesville Water System Improvements
10842	GA	Habersham	1991	Demorest Water System Improvements
10839	GA	Jackson	1992	Braselton Wastewater System Improvements
11028	GA	Lumpkin	1992	Lumpkin County Industrial Park Water and Sewer Improvements
10855	GA	Stephens	1991	Toccoa Industrial Park Water/Sewer Lines
11027	GA	Towns	1992	Hiawasee Sewer System Improvements
11043	GA	Towns	1992	Young Harris Wastewater Improvements
11204	KY	Boyd	1991	Boyd Rural Sanitary Sewer System Phase I
11141	KY	Clark	1992	Winchester / Clark County Industrial Park
12577	KY	Clay	1996	Clay / Leslie Industrial Park Expansion
11169	KY	Lincoln	1992	Crab Orchard Water and Sewer
10313	KY	Monroe	1992	Gamaliel Wastewater System
11091	KY	Powell	1992	Clay City Wastewater Plant Improvement
10845	KY	Powell	1990	Powell County Water Treatment Plant
11170	KY	Pulaski	1991	Garland Road Water Extensions
11142	KY	Pulaski	1992	Nelson Valley Water System
11587	KY	Rockcastle	1994	Rockcastle Industrial Park - Phase 2
11200	KY	Rockcastle	1991	Rockcastle Waterline Extension
12151	KY	Rowan	1995	Highway 32 Industrial Park
11118	KY	Russell	1992	Russell Springs Sewer Extension
11037	MD	Allegany	1992	Allegany County
11000	MD	Washington	1992	Hagerstown Junior College Technical Innovation Center
12047	MS	Alcorn	1995	Alcorn County South Industrial Park Improvements
10936	MS	Choctaw	1994	Package Corporation of America's Utility Pole Mill Access Road
10892	MS	Choctaw	1991	Marion Smith Industrial Access Road
10902	MS	Choctaw	1991	Choctaw Water Improvements
11111	MS	Clay	1992	White Station Water Distribution Extension
10354	MS	Itawamba	1989	Fulton-Genesis Project
11104	MS	Itawamba	1993	Fulton MS Industrial Road
10934	MS	Lee	1991	Turner Industrial Park Access Road
11445	MS	Lee	1994	Lee MS-Bryce-Toga Industrial Access Road
11102	MS	Lee	1992	Coley Road Improvements
10937	MS	Lee	1991	Eason Blvd. Intersection Improvements
9874	MS	Lowndes	1987	Columbus - Lowndes County Riverside Industrial Park Access
10901	MS	Pontotoc	1991	Ecru Industrial Park Improvements
9711	MS	Tishomingo	1990	Tishomingo County / Midway Access Road: Phases 1 & 2

Project ID	State	County	Year	Project Name
11110	MS	Tishomingo	1992	Northeast MS Industrial Park Water Facility - Phase I
10617	MS	Union	1996	Union County / New Albany Water-Sewer
10904	MS	Winston	1991	Noxapater Water Improvements
11376	NC	Buncombe	1993	Vista Industrial Center Water and Sewer
12204	NC	Caldwell	1995	Gamewell Industrial Sewer Project
11151	NC	Clay	1994	Hayesville Water and Sewer Improvements
10882	NC	McDowell	1992	McDowell County Water and Sewer Extension
10621	NY	Cattaraugus	1994	Cattaraugus Economic Development Zone Infrastructure
10564	NY	Cattaraugus	1990	Cattaraugus Incubator Phases I & II
11158	NY	Chautauqua	1992	Riverside Industrial Center Foundry Renovation
10513	NY	Chautauqua	1990	Jamestown North Main Street Reconstruction
12232	NY	Cortland	1996	J.M. Murray Center Incubator
11155	NY	Stueben	1992	Hornell Commercial Center Water and Sewer Extension
10574	OH	Belmont	1990	Fox-Shannon Industrial Park Improvements
8851	OH	Clermont	1983	Clermont County Industrial Access Road
11092	OH	Muskingum	1992	East Muskingum Water System Expansion
10922	OH	Tuscarawas	1991	Barmont Industries Sewer Extension
11224	OH	Washington	1992	Marietta Food-4-Less Access Road
11679	PA	Beaver	1994	Aliquippa Industrial Park (LTV) Project
11396	PA	Cambria	1993	Cambria County Industrial Park Infrastructure
11692	PA	Erie	1994	West Erie EZ-Veschecco Industrial Park
11197	PA	Erie	1992	Erie PA Uniflow Project
10392	PA	Forest	1989	Marienville Sewage Improvements
10887	PA	Luzerne	1991	CAN DO Corporate Center Infrastructure
10828	PA	McKean	1991	Bradford Enterprise Development Center
10674	PA	McKean	1990	Allegheny Particleboard Industrial Park
11398	PA	McKean	1993	Bradford Area Multi-Tenant Center
11195	PA	Mifflin	1992	MCIDA Plaza Renovation
10865	PA	Venango	1991	Franklin Area Industrial Complex Renovations
12414	SC	Cherokee	1996	Carolina Factory Shops Infrastructure
11163	SC	Grnville.-Spartanbg.	1993	BMW Sewer Improvement
10853	TN	Campbell	1992	Careyville / Jacksboro Water Treatment Plant Improvement
11098	TN	Campbell	1992	Jellico Inflow / Infiltration
11083	TN	Grainger	1992	Rutledge Wastewater Treatment
12372	TN	Johnson	1995	NN Ball & Roller Co.
11082	TN	Marion	1992	Jasper Veriform Industrial Location
11080	TN	Polk	1992	Benton Water System
11166	VA	Buchanan	1992	Slate Creek Industrial Site
11165	VA	Dickenson	1992	Clintwood / Skeetrock Water Project
10929	VA	Dickenson	1991	Dickenson County Industrial Development Project
12183	VA	Scott	1996	Holston Regional Sewer System Extension
12508	VA	Wise	1996	Esserville Sewer Line Replacement
12350	WV	Brooke	1996	Three Springs Business Park
10381	WV	Harrison	1990	Benedum Airport - Air Center Project
12352	WV	Logan	1996	SW Regional Jail / Industrial Park Water Project
11493	WV	Marion	1994	WV Hi-Tech Consortium / Incubator
10998	WV	Mercer	1992	Gardner / Turnpike Industrial Water and Sewer
11013	WV	Putnam	1992	Winfield Sewer Extension
11148	WV	Roane	1992	Long Ridge Water Project
12128	WV	Wayne	1995	Kenova Buffalo Creek Water

Project Contacts

James	Akins	10901 Ecu Industrial Park Improvements	Pontotoc	MS
Thelma	Anderson	10313 Gamaliel Wastewater System	Monroe	KY
Donald	Baker	10929 Happy Valley Industrial Development Project	Dickenson	VA
		11165 Clintwood/Skeetrock Water Project	Dickenson	VA
Jerry	Balding	11163 BMW Sewer Improvement	Grnville.-Spartanbg.	SC
Diane	Balmer	11027 Hiwassee Sewer System Improvements	Towns	GA
Ronnie	Bell	10934 Turner Industrial Park Access Road	Lee	MS
Phyllis	Benson	10902 Choctaw Water Improvements	Choctaw	MS
		10904 Noxapater Water Improvements	Winston	MS
		10936 PCA Utility Pole Mill Access Road	Choctaw	MS
		11111 White Station Water Distribution Extension	Clay	MS
Darrell	Beshears	11170 Garland Road Water Extensions	Pulaski	KY
Eugene	Bishop	11110 NE MS Industrial Park Water Facility - Phase I	Tishomingo	MS
Barbara	Bonz	10993 Ellijay-Gilmer County Water Line	Gilmer	GA
Hale	Booth	11080 Benton Water System	Polk	TN
		11082 Jasper Veriform Industrial Location	Marion	TN
Larry	Bossolt	11692 West Erie EZ-Veschecco Industrial Park	Erie	PA
Ann	Bowen	11082 Jasper Veriform Industrial Location	Marion	TN
Rebecca	Bradley	11679 Aliquippa Industrial Park (LTV) Project	Beaver	PA
Henry	Braselton	10839 Braselton Wastewater System Improvements	Jackson	GA
Gwen	Brown	11098 Jellico Inflow/Infiltration	Campbell	TN
Bobby	Brown	10488 Hanceville Industrial Park	Cullman	AL
John	Brunner	11200 Rockcastle Waterline Extension	Rockcastle	KY
Mary	Buckelew	10988 Kings Point Water Line Extension	Jefferson	AL
Ron	Budash	11396 Cambria County Industrial Park Infrastructure	Cambria	PA
Chris	Burke	11163 BMW Sewer Improvement	Grnville.-Spartanbg.	SC
Robert	Calvert	10936 PCA Utility Pole Mill Access Road	Choctaw	MS
Tony	Cannon	11163 BMW Sewer Improvement	Grnville.-Spartanbg.	SC
Buzz	Cardolofus	11200 Rockcastle Waterline Extension	Rockcastle	KY
Sammy	Carter	10904 Noxapater Water Improvements	Winston	MS
Keith	Carter	10988 Kings Point Water Line Extension	Jefferson	AL
Rick	Cauthen	11163 BMW Sewer Improvement	Grnville.-Spartanbg.	SC
Andrew	Chaffin	11165 Clintwood/Skeetrock Water Project	Dickenson	VA
		11166 Slate Creek Industrial Site	Buchanan	VA
		10929 Happy Valley Industrial Development Project	Dickenson	VA
Betty	Cochran	10828 Bradford Enterprise Development Center	McKean	PA
		11398 Bradford Area Multi-Tenant Center	McKean	PA
John	Coggin	11445 Lee MS-Bryce-Toga Industrial Access Road	Lee	MS
David	Cole	10998 Gardner/Turnpike Industrial Water and Sewer	Mercer	WV
Jo	Cook	11200 Rockcastle Waterline Extension	Rockcastle	KY
Linda	Cox	10756 Harrisburg Water System Improvements	Bibb	AL
Jack	Creeley	10354 Fulton-Genesis Project	Itawamba	MS
John	Creighton	11376 Vista Industrial Center Water and Sewer	Buncombe	NC
Juniata	Crumley	10842 Demorest Water System Improvements	Habersham	GA
Terry	Dailey	11151 Hayesville Water and Sewer Improvements	Clay	NC
Stewart	Darcy	11142 Nelson Valley Water System	Pulaski	KY
Bernadette	Debias	10887 CAN DO Corporate Center Infrastructure	Luzerne	PA
Donna	Dias	11170 Garland Road Water Extensions	Pulaski	KY
Mona	Dockard	10313 Gamaliel Wastewater System	Monroe	KY
Bobbie Jean	Dodd	10758 Eldridge Water Service Extension	Walker	AL
Glen	Duckworth	10617 Union County/New Albany Water-Sewer	Union	MS
Rob	Dunn	10882 McDowell County Water and Sewer Extension	McDowell	NC
Penny	Eddy	10674 Allegheny Particleboard Industrial Park	McKean	PA
Lonnie	Edenfield	10855 Toccoa Industrial Park Water/Sewer Lines	Stephens	GA
Sam	Erwin	12204 Gamewell Industrial Sewer Project	Caldwell	NC

Wanda	Farmer	10489 Arley Water System Improvements	Winston	AL
Susie	Figg	10845 Powell County Water Treatment Plant	Powell	KY
Charlie	Ford	9874 Riverside Industrial Park Access	Lowndes	MS
Mark	French	11028 Industrial Park Water and Sewer Improvements	Lumpkin	GA
Tom	Gallagher	12232 J.M. Murray Center Incubator	Cortland	NY
Richard	Galloway	9994 Huntsville Industrial Park Improvements	Madison	AL
Larry	Gerard	11043 Young Harris Wastewater Improvements	Towns	GA
Greg	Giacelli	10934 Turner Industrial Park Access Road	Lee	MS
Shelia	Glasco	11043 Young Harris Wastewater Improvements	Towns	GA
James	Griffin	11155 Hornell Commercial Center Water and Sewer Ext.	Stueben	NY
Joe	Griffith	10892 Marion Smith Industrial Access Road	Choctaw	MS
Joseph	Griswold	10865 Franklin Area Industrial Complex Renovations	Venango	PA
Sammy	Hammons	11587 Rockcastle Industrial Park - Phase 2	Rockcastle	KY
Glenna	Hampton	11587 Rockcastle Industrial Park - Phase 2	Rockcastle	KY
Perry	Hand	11102 Coley Road Improvements	Lee	MS
John	Hardy	9874 Riverside Industrial Park Access	Lowndes	MS
Richard	Harris	11037 Allegany County	Allegany	MD
Don	Hassel	10845 Powell County Water Treatment Plant	Powell	KY
		11091 Clay City Wastewater Plant Improvement	Powell	KY
Ginger	Helms	12183 Holston Regional Sewer System Extension	Scott	VA
Bobby	Hodge	9711 Midway Access Road: Ph. 1 & 2	Tishomingo	MS
Sean	Hogan	11155 Hornell Commercial Center Water and Sewer Ext.	Stueben	NY
Ron	Holloway	10993 Ellijay-Gilmer County Water Line	Gilmer	GA
Willie	Holmes	10902 Choctaw Water Improvements	Choctaw	MS
Larry	Homan	11104 Fulton MS Industrial Road	Itawamba	MS
Jerry	Hood	10839 Braselton Wastewater System Improvements	Jackson	GA
Teresa	Hooker	10901 Ecrú Industrial Park Improvements	Pontotoc	MS
		11104 Fulton MS Industrial Road	Itawamba	MS
		10354 Fulton-Genesis Project	Itawamba	MS
Lyle	Hunter	10998 Gardner/Turnpike Industrial Water and Sewer	Mercer	WV
Jim	Inman	12414 Carolina Factory Shops Infrastructure	Cherokee	SC
Clyde	James	12151 Highway 32 Industrial Park	Rowan	KY
Tim	Kearney	11037 Allegany County	Allegany	MD
Will	Kelly	12372 NN Ball & Roller Co.	Johnson	TN
Phil	Kerrick	11141 Winchester/Clark County Industrial Park	Clark	KY
Brenda	Kincaid	12204 Gamewell Industrial Sewer Project	Caldwell	NC
Greg	Kit	11083 Rutledge Wastewater Treatment	Grainger	TN
Claude	Kreiger	11166 Slate Creek Industrial Site	Buchanan	VA
Brookes	Krocke	9994 Huntsville Industrial Park Improvements	Madison	AL
Jan	Kurth	10513 Jamestown North Main Street Reconstruction	Chautauqua	NY
		11158 Riverside Industrial Center Foundry Renovation	Chautauqua	NY
Frank	Langan	10817 Blount Mountain Water Extension	Blount / St. Clair	AL
Heidi	Lauthrey	11224 Marietta Food-4-Less Access Road	Washington	OH
Doug	Leather	11000 Hagerstown Jr. College Technical Innovation Center	Washington	MD
Albert	Lester	12128 Kenova Buffalo Creek Water	Wayne	WV
Glen	Long	10937 Eason Blvd. Intersection Improvements	Lee	MS
Zell	Long	11102 Coley Road Improvements	Lee	MS
Chris	Marschner	11000 Hagerstown Jr. College Technical Innovation Center	Washington	MD
Jack	Martin	10978 Florence-Lauderdale County Port Development	Lauderdale	AL
Barbara	Mathis	11027 Hiawassee Sewer System Improvements	Towns	GA
Susan	Matlock	10751 Birmingham BAN Tilman Levenson Building	Jefferson	AL
Steve	McAneny	11396 Cambria County Industrial Park Infrastructure	Cambria	PA
Larry	McCallum	12047 South Industrial Park Improvements	Alcorn	MS
Peter	McCord	11163 BMW Sewer Improvement	Grnville.-Spartanbg.	SC
Zell	McCullough	10937 Eason Blvd. Intersection Improvements	Lee	MS
Don	Meyer	10574 Fox-Shannon Industrial Park Improvements	Belmont	OH
Bonnie	Mills	11083 Rutledge Wastewater Treatment	Grainger	TN

Sam	Minor	10489 Arley Water System Improvements	Winston	AL
		10978 Florence-Lauderdale County Port Development	Lauderdale	AL
Stephen	Moore	10572 Cullman Infrastructure Improvements	Cullman	AL
Vaughn	Morris	11142 Nelson Valley Water System	Pulaski	KY
William	Morse	10855 Toccoa Industrial Park Water/Sewer Lines	Stephens	GA
Lloyd	Naylor	11148 Long Ridge Water Project	Roane	WV
Robert	Nelson	10757 Nauvoo Water System Improvements	Walker	AL
Kevin	O'Donnell	10887 CAN DO Corporate Center Infrastructure	Luzerne	PA
Ray	Oliverio	11493 WV Hi-Tech Consortium/Incubator	Marion	WV
James	Paige	10513 Jamestown North Main Street Reconstruction	Chautauqua	NY
Jim	Palmer	11679 Aliquippa Industrial Park (LTV) Project	Beaver	PA
Patsy	Patterson	10617 Union County/New Albany Water-Sewer	Union	MS
Robert	Ploehn	11197 Erie PA Uniflow Project	Erie	PA
		11692 West Erie EZ-Veschecco Industrial Park	Erie	PA
Robert	Postal	11195 MCIDA Plaza Renovation	Mifflin	PA
Fred	Raider	11148 Long Ridge Water Project	Roane	WV
John	Rayburn	11028 Industrial Park Water and Sewer Improvements	Lumpkin	GA
Ken	Rea	12372 NN Ball & Roller Co.	Johnson	TN
Barbara	Rector	11092 East Muskingum Water System Expansion	Muskingum	OH
Dirk	Reys	11163 BMW Sewer Improvement	Grnville.-Spartanbg.	SC
		12414 Carolina Factory Shops Infrastructure	Cherokee	SC
Glen	Rhodes	10882 McDowell County Water and Sewer Extension	McDowell	NC
Don	Rigby	12350 Three Springs Business Park	Brooke	WV
Rick	Roberts	12352 SW Regional Jail/Industrial Park Water Project	Logan	WV
Larry	Robinson	10922 Barmont Industries Sewer Extension	Tuscarawas	OH
Bill	Roger	10842 Demorest Water System Improvements	Habersham	GA
John	Romano	11013 Winfield Sewer Extension	Putnam	WV
Susking	Roy	12232 J.M. Murray Center Incubator	Cortland	NY
Laura	Rubino	11679 Aliquippa Industrial Park (LTV) Project	Beaver	PA
Jim	Rudloff	11092 East Muskingum Water System Expansion	Muskingum	OH
Bob	Rusiewski	10674 Allegheny Particleboard Industrial Park	McKean	PA
Danny	Ryan	9711 Midway Access Road: Ph. 1 & 2	Tishomingo	MS
Don	Rychnowski	10564 Cattaraugus Incubator Phases I & II	Cattaraugus	NY
Connie	Sansone	11013 Winfield Sewer Extension	Putnam	WV
George	Schanzenbacher	10564 Cattaraugus Incubator Phases I & II	Cattaraugus	NY
		10621 Cattaraugus Econ. Dev. Zone Infrastructure	Cattaraugus	NY
Betty	Scott	11445 Lee MS-Bryce-Toga Industrial Access Road	Lee	MS
Cabe	Sexton	10853 Careyville/Jacksboro Water Treatment Improvement	Campbell	TN
Philip	Shelton	11169 Crab Orchard Water and Sewer	Lincoln	KY
Bill	Shot	11118 Russell Springs Sewer Extension	Russell	KY
Boyer	Simcox	11224 Marietta Food-4-Less Access Road	Washington	OH
David	Sinney	8851 Clermont County Industrial Access Road	Clermont	OH
Joe	Sisler	11204 Boyd Rural Sanitary Sewer System Phase I	Boyd	KY
Onzie	Sizemore	12577 Clay/Leslie Industrial Park Expansion	Clay	KY
Jim	Skidmore	10381 Benedum Airport - Air Center Project	Harrison	WV
Glen	Skinner	12508 Esserville Sewer Line Replacement	Wise	VA
		12183 Holston Regional Sewer System Extension	Scott	VA
Gary	Smith	10381 Benedum Airport - Air Center Project	Harrison	WV
Peggy	Smith	10572 Cullman Infrastructure Improvements	Cullman	AL
Carter	Smith	11163 BMW Sewer Improvement	Grnville.-Spartanbg.	SC
Nicky	Smith	11204 Boyd Rural Sanitary Sewer System Phase I	Boyd	KY
Carl	Snodgrass	12508 Esserville Sewer Line Replacement	Wise	VA
Dave	Spencer	10381 Benedum Airport - Air Center Project	Harrison	WV
Jeff	Stagerwold	10865 Franklin Area Industrial Complex Renovations	Venango	PA
Jan	Starkey	10922 Barmont Industries Sewer Extension	Tuscarawas	OH
Richard	Sutherland	10488 Hanceville Industrial Park	Cullman	AL
Joe	Swafford	12577 Clay/Leslie Industrial Park Expansion	Clay	KY

Debbie	Swiggert	11080 Benton Water System	Polk	TN
Woodie	Swofford	11098 Jellico Inflow/Infiltration	Campbell	TN
Lawrence	Taylor	11158 Riverside Industrial Center Foundry Renovation	Chautauqua	NY
Marcel	Thomas	10997 Parrish Sewer Line Extension	Walker	AL
Don	Threadgill	10892 Marion Smith Industrial Access Road	Choctaw	MS
Sam	Tolbert	10800 Clarkesville Water System Improvements	Habersham	GA
Matt	Van Sant	8851 Clermont County Industrial Access Road	Clermont	OH
Morris	Vaughn	11170 Garland Road Water Extensions	Pulaski	KY
Franklin	Wallace	10853 Careyville/Jacksboro Water Treatment Improvement	Campbell	TN
David	Warner	12350 Three Springs Business Park	Brooke	WV
Lanna	Watkins	10574 Fox-Shannon Industrial Park Improvements	Belmont	OH
Gwen	Weaver	11151 Hayesville Water and Sewer Improvements	Clay	NC
Shelia	Wheeler	12128 Kenova Buffalo Creek Water	Wayne	WV
Del	White	12151 Highway 32 Industrial Park	Rowan	KY
Dan	White	12352 SW Regional Jail/Industrial Park Water Project	Logan	WV
Mac	Williams	11376 Vista Industrial Center Water and Sewer	Buncombe	NC
Jonnie	Wires	10758 Eldridge Water Service Extension	Walker	AL
Jim	Witt	11104 Fulton MS Industrial Road	Itawamba	MS
Rich	Wood	10381 Benedum Airport - Air Center Project	Harrison	WV
Mary	Wood	10800 Clarkesville Water System Improvements	Habersham	GA
Rich	Wood	11493 WV Hi-Tech Consortium/Incubator	Marion	WV
Joel	Woolford	11118 Russell Springs Sewer Extension	Russell	KY
John	Wooten	12204 Gamewell Industrial Sewer Project	Caldwell	NC
Jack	Wright	10757 Nauvoo Water System Improvements	Walker	AL
Jack	Wright	10817 Blount Mountain Water Extension	Blount/St. Clair	AL
Jack	Wright	10997 Parrish Sewer Line Extension	Walker	AL
Farley	Wright	10392 Marienville Sewage Improvements	Forest	PA

Endnotes

¹ There is considerable overlap between project classifications, and case-by-case judgements had to be made on the most appropriate classification of several projects in the database. Part of the explanation of this overlap lies in the practical purpose of the specific project funding need, since part of the ARC program's generally acknowledged role in the economic development community is to satisfy funding gaps that other programs cannot. Thus, ARC's investments might fund site preparation in one case, rehab of an older industrial building in the next, an industrial access road in a third and a sewer line to an industrial park in a fourth—all depending on the specific project and funding gaps it may face. This flexibility of the ARC program is generally recognized by recipients as one of the program's strengths, which is designed to leverage other state and federal funding resources, such as those in the Economic Development Administration, Department of Housing and Urban Development and the Rural Development Administration (formerly Farmer's Home).

² Because of the wide array of start and end dates and, just as important, the relatively recent completion of many projects under review, it was not generally possible to use the time-series to evaluate long-term impacts from the projects.

³ A handful of projects were excluded as detailed above, but the timeframe parameters applied to potential projects were the single largest excluding factor.

⁴ For instance, the residential projects will by definition have positive values for the number of households served, but zeros for the numbers of businesses served (and associated jobs). The opposite is true for the economic development projects. Thus, 5 of the 13 states have zero totals for the number of households served, because all of their projects were economic development (rather than residential) projects.

⁵ The U.S. Bureau of Labor Statistics ES-202 series data provides average wage per worker for workers subject to unemployment insurance. These data are available for commercial and industrial sectors of the economy for every individual county. In roughly half of the cases in which reliable payroll data were not available on local wage impacts of the projects, the ES-202 data for the year 1996 were multiplied by reported job impacts to estimate corresponding wage impacts.

⁶ See Appendix C for a further discussion of the calculation of indirect and induced effects, and details of the IMPLAN model.

⁷ These multipliers reflected the ratio of total wage impacts to direct wage impacts, and were specific to both the county and industries in which direct effects occurred. See the Appendix C for a further discussion of the calculation of indirect and induced effects, and details of the IMPLAN model.

⁸ Retained jobs estimated by the Hagerstown TIC are excluded because of their difficult-to-calculate nature.

⁹ There is overlap in the practical purpose of these projects, since part of the ARC's role is to satisfy funding gaps which other programs cannot. Thus, the same basic investment decision methodology might fund site preparation in one case, rehab of an older industrial building in the next, an industrial access road in a third, and a sewer line to an industrial park in a fourth—all depending on the specific project and funding gaps it may face. Nevertheless, a discussion of various project classifications is useful as a means of exploring statistical and more subjective impacts as well.

¹⁰ In at least one case, however, which was not included in the sample evaluation in an effort to maintain an "apples and apples" evaluation, ARC investment covered working capital for incubator operations.

¹¹ Of course, the deeper the level of industry detail, the more effective the analysis. In this case, project resources permitted an analysis at the "one-digit" Standard Industrial Classification level. This level of detail indicates, for example, the relative dependence of an area on mining, but cannot reflect a shift, such

as from apparel to transportation equipment. At the level of one-digit sectors, shifts in economic concentrations were measured between the following: Agriculture, Mining, Construction, Manufacturing, Public Utilities/Transportation, Wholesale Trade, Retail Trade, Fire-Insurance-Real Estate, and Services.

¹² These figures include extraction operations; other related (but not directly resource-dependent) industries, such as mining equipment, are included in manufacturing and other totals.

¹³ These findings support those from the Brandow Company's *1999 Retention Index of the States* that retention levels are highest among manufacturing firms nationally.

¹⁴ In rating terms, the 1.00 1988 designation of the non-sample group improved to 1.24. By FY2000, six of the sample group improved their ratings to transitional, improving the project group's average from 1.00 to 1.33.

¹⁵ In rating terms, the 2.00 1988 designation of this group dropped to 1.94.

¹⁶ Many of the unsampled counties probably had ARC-funded infrastructure projects, although most of these are still open, or have been complete for a number of years. At the same time, the sampled counties performed better over the 12-year period than the unsampled counties. It could be that the projects had a substantial impact in this differential. On the other hand it may be the case that sampled projects came from counties that were experiencing or anticipating growth opportunities. But in such cases, the ability to recognize and fund such opportunities is worth recognizing.

¹⁷ Economic growth patterns were measured for all primary impact counties for the years 1990-96 regardless of the actual completion date of the project or projects within them.

¹⁸ Because of inevitable and varied lags in business reporting, it is more accurate to say that the vitality analyses cover a three-year period ranging from 1995 to 1999. Original attempts to perform the vitality analyses from earlier periods were discarded because of concerns regarding data integrity.