

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

Developed for the
Appalachian Regional Commission
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Contents

Executive Summary.....	i
1. Introduction.....	1
2. Overview of Projects.....	10
3. Overall Economic Impact Measures.....	15
4. Evaluation of Impacts by Project Type.....	41
5. Localized Project Impacts.....	61
6. Economic Conditions in Project Areas.....	82
7. Key Findings, Issues and Recommendations.....	98

Appendices:

Appendix A: Site Visit Narratives.....	107
Appendix B: Methodology: Project Selection.....	127
Appendix C. Methodology: Impact Analysis.....	131
Appendix D: Methodology, Economic Vitality Analysis.....	137
Appendix E: Methodology, Distressed County Analysis.....	139
Appendix F: Project List.....	141
Appendix G. Interview Contact List.....	144

Electronic Appendices

Appendix H. Electronic Impact-Interview Database	
Appendix I. Project Impact-Interview Project Thumbnails	
Appendix I. Project Area Economic Condition Thumbnails	
Appendix J. Project Area Economic Condition Spreadsheet Details	

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

Executive Summary

During 2006, the Appalachian Regional Commission (ARC) conducted an evaluation of infrastructure and public works projects to determine if projects achieved their original objectives. In addition, as part of the Commission's on-going performance evaluation process, the ARC assessed how these project investments contributed to attaining the Commission's strategic objectives.

The report is primarily concerned with economic development impacts; the 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, changes in public health and quality of life that may have resulted from various projects are not quantified.

Projects Evaluated:

The ARC initiated and closed over four hundred investment projects during the period 1999-2005. Of these, 104 were selected for close review during the study process, including 33 industrial park and site projects; 51 water and sewer projects (32 with primarily economic development impacts); 3 access road projects; 5 business incubator projects; 8 telecommunications projects; and 4 housing projects. Of the total of 104 projects analyzed, 78 (75%) reflected objectives and outcomes directly related to economic development. Remaining projects had mainly residential or community quality of life objectives

In total ARC invested \$29.4 million in these projects. Additional funds were invested by various other federal, state and local development agencies.

Project files and interviews with local stakeholders formed the basis for evaluation of each project, including statistical checks and subjective discussion of project impacts.

Project Impact Assessment of Outcomes

The sampled projects created a total of 17,645 direct new jobs as a result of the ARC-funded projects. In addition, 9,580 existing jobs were directly retained (saved) as a result of the ARC-funded projects. It is important to note that these impacts reflect only jobs created by sample pool projects, about one-quarter of the total program project investments made by ARC. Thus, the total number of jobs created or retained by program project investments was much higher than

tabulated in the report. The tabulated jobs were overwhelmingly developed among the 78 projects which suggested a primarily economic develop focus.

These economic development projects generated \$638.8 million in new annual wages from direct newly created jobs, and helped to directly retain \$325.2 million of existing annual wages at threatened jobs.

Project job creation led to a net expansion of \$1.3 billion of annual personal income (including indirect effects). Put another way, for a **one-time** public investment in these economic development projects, there was \$9.28 of **annual recurring** personal income per public dollar invested.

The 78 non-residential infrastructure projects leveraged total private investment of \$1.7 billion, a ratio of \$75 to \$1 of investment. The estimated project impacts on annual tax collections include an estimated \$13.3 million in annual state income tax revenue, annual state and local sales tax revenue of \$16.6 million; and annual local property tax revenue of \$14.2 million.

Project Category Impacts

The 21 sampled **industrial park projects** created 8,812 direct new jobs and retained 968. Nevertheless, new jobs and businesses served were slightly lower than projected levels in part due to the project development and maturation process. Actual jobs retained were also slightly lower than projected numbers.

The five sampled **business incubator projects** created 688 direct new jobs and retained 115. Actual results for new businesses were 6% above projected levels, while the number of retained businesses served met projections. The number of new jobs created was 71% above projections, while the number of retained jobs was slightly below projections.

The three sampled **access road projects** created 200 direct new jobs and retained 1,185. The number of new businesses served was greater than projected, while the number of retained businesses served exceeded projections by 40%. The number of retained jobs came in below projections.

The 32 sampled non-residential **water/sewer projects** created 6,966 direct new jobs and retained 7,160. The number of new direct jobs created was more than twice the projected number, while the number of new businesses served was almost 44% over the projected total.

Of twelve **industrial site projects**, ten had been at least partially implemented by the end of the evaluation process. The implemented projects created 100 direct new jobs (21% lower than projected) and retained 152. Actual businesses served and retained met projected levels. Jobs retained were slightly higher than

projected. Of the other two projects, one was a planning-only project, the other delayed.

The five economic development-oriented **telecommunications projects** in the sample created 128 direct new jobs. Actual businesses served were more than three times projected levels. New jobs were created 19% above projected levels. The projects also served 600 households.

	Project Impact	Ratio per ARC \$	Ratio per Public \$
Direct Private Investment	\$942 million*	42:1	6.4:1
Total Private Investment (including indirect)	\$ 1.7 billion*	75 : 1	12 : 1
Jobs			
New Jobs: Direct	17,645	\$1,274/job	\$8,102/job
Retained Jobs: Direct	9,580	\$475/job	\$2,803/job
Income			
From New Jobs: Direct	\$ 634.4 million	28 to 1	4.4 to 1
From Retained Jobs	\$ 325.2 million	71 to 1	12 to 1

* All ratios are based on non-residential project funding: ARC \$22.5 million, total public \$140.5 million.

* Totals include large impact resulting from a single project (Huntsville, AL Research Park)

Project Area

In addition to the project-specific analysis, the report looked at economic vitality measures in project areas, offering context of ongoing strengths, weaknesses and potential needs which could be addressed by future projects and programs.

The report indicated some serious gaps in the Region's current ability to grow in the direction of the US economy, as evidenced in the **area diversification** analysis.

One measurement used was the proportion of local company sales by sector. We used this measure to assess industry mix relative to national patterns. In general, technology, finance and other traded services are under-strength in far more than half of the project areas.

The vitality analysis also found disturbing lags among longer term Regional firms. The **mature firm growth** analysis measured the growth of longer-term project area firms of various sizes against growth of their peers throughout the US. Among other findings, concentrations of mature firms in the smallest sales category analyzed are 10% higher than US averages in 43 of 91 areas; and 20%

higher in 19 areas. In other words, mature firms are smaller in project areas (and the Region) than in the US as a whole.

Mature firms also grow at a much slower rate than the national average, suggesting that additional resources devoted to retention assistance programs would be helpful.

Entrepreneurial vitality was measured over three time series during the 1999-2005 period. The results indicated that startup rates are 81% of the US average in all project areas. Startup rates are less than 80% of the US average in 60 project areas, and less than 50% of US levels in 15 project areas.

As was the case in 2000 infrastructure evaluation, the entrepreneurial vitality analysis indicates strongly that ARC's entrepreneurship assistance should be retained and strengthened to encompass entrepreneurial assistance efforts in addition to the current incubator focus.

Strategic Impacts

Statistical impacts are of course important as measurement tools, but program effectiveness should be considered in light of the progress on strategic objectives which address Regional concerns. Local project impacts of the projects assessed in the sample pool indicate progress on a number of Regional objectives.

Economic diversification was enhanced by the projects, as reflected through industry development which targeted previously under-represented sectors, including distribution, tourism, healthcare, prison development and commercial diversification. **Reuse of vacant or underutilized sites** and revitalization of surrounding areas was the core focus of some of the most successful projects, and a by-product of others. **Support for traditional industries** that continue to be the mainstay of many project counties was evident in the choice of industrial retention projects. **Speculative development** efforts, while not always matured or successful, helped attract new businesses to project areas. **Work force development** resulted from new and additional skill demands which surfaced during job creation efforts. **Entrepreneurial support** was evident in the several business incubator projects that focused business community and educational institution efforts on a felt Regional need.

In addition, **non-economic community service impacts** were evident in projects that developed senior housing and service centers and created focal points for social and community activity. **Regional technology services** were enhanced by both economically-driven and community based projects that included the development or extension of high speed internet access to underserved rural areas.

The assessment also resulted in these additional observations:

Measured outcomes indicate a reasonable investment strategy. All project classifications appeared to fall within reasonable and accepted job cost parameters. In general, there is a clear efficiency to utilizing projects that serve multiple firms as most (except industrial site projects) are likely to do.

Costs associated with development of incubators are undertaken with the understanding that the most meaningful job creation accrues in later stages. Because of the stark problems of entrepreneurship faced by many counties in the Region, the solid new job return on investment of incubators is specifically noted.

Projects made progress on strategic objectives. While statistical measures are important, progress on strategic objectives which address the weaknesses of the Region are at least as critical to the investment process. Sample pool projects had real impact on their host communities, often far beyond (and sometimes in different directions) than originally anticipated.

There is a highly favorable perception of the ARC program. The Region's administrative approach 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. Project stakeholders consistently commented on the ease of working with the ARC, and several noted with approval the ARC's ability to invest in planning and feasibility studies necessary to subsequent projects. Representatives of almost three-quarters of all projects in the sample pool (and 76% of all economic development project) expressed the opinion that their specific projects would not have been undertaken or completed without ARC participation.

Additional focus on telecommunications investments and traded services would be a good idea. Sixty-four percent of all project areas report communications sector sales concentrations (area based firms) that are less than 50% of the US average. Seventy-five percent of all project areas reported sales concentrations of area-based Financial Services and related firms at least 20% below national levels. As manufacturing declines across the economy, value-added traded services (that is, services which are likely to bring in dollars from outside the area in which a company is located) become critical value-added generators for the local economy.

A variety of stakeholders expressed the need for more rural broadband access and telecommunications investment by the ARC. This envisioned focus was at least as pervasive as expressions of interest regarding more traditional infrastructure needs.

Consider simultaneous telecommunications and bricks-and-mortar investments in single sites. The frequent emphasis placed by project stakeholders on the impact of telecommunications enhancements for businesses in rural areas suggests that ARC consider simultaneous investments (bricks-and-mortar and telecommunications) at single sites. From urban locations with routine broadband and cable access, it's easy to forget the relative advantage of businesses in connected areas over those which are not so favored. The attraction of rural sites, and the added likelihood of success for businesses at those sites, is greatly enhanced by state-of-the-art telecommunication infrastructure. On a case by case basis, ARC should consider enhancing the competitive advantage of its bricks and mortar investments with corollary telecommunications project investments as well.

Consider retention growth investments. Mature project area firms grew more slowly than the national rate of that peer group (using annual reported sales as a benchmark). Moreover, the separate entrepreneurial activity analysis indicated that many Appalachian areas coupled the "mature firm growth" lags with sluggish entrepreneurial activity. These findings call for the development of the programmatic efforts aimed at the growth of mature regional firms.

Consider expanding investments in entrepreneurship. Entrepreneurship lags extensively throughout host areas of projects in the sample pool. This is the case in the current evaluation round as it was in the last. Some progress has been made in some locations, but the Region's distressed, at-risk and transitional areas still reflect sluggish long-term entrepreneurial activity.

The good news is that focused efforts to address this problem appear to work. Incubators were among the most successful projects in this evaluation, as they were in the 2000 evaluation round. Incubators sustain new businesses, help create jobs, and appear to retain the firms and jobs they create in the areas served. Additional investment with entrepreneurial targets -- incubator and technical assistance -- is highly recommended.

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

1. Introduction

1.1 Purpose

The Appalachian Regional Commission (ARC) conducted this evaluation of infrastructure and public works projects to determine if 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.

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, retained business growth, entrepreneurship, and 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.

It is important to note that while reporting mandates are an important impetus for this report (and occupy much of the space in it), the more significant impacts are those which can be seen on the strategic advances made by ARC investments. Statistical impacts are clearly one measure of success, and an important one. But often, more subjective results, such as those discussed in Chapter 5, offer a better flavor of strategic progress made as a result of the investments.

1.2 Coverage of This Study

This project follows a 2000-2001 evaluation of programs funded under the Commission's Infrastructure and Public Works Program.

As with the previous study, the infrastructure projects evaluated in this round represent a range of projects typically funded by the Commission including industrial parks and sites, water and sewer systems, access roads, and business incubators. Housing and telecommunications projects were added to the mix in the current evaluation round.

From a pool of over 400 closed projects, ARC selected a sample of 124 completed representative projects that were funded in part by the Commission between 1998 and 2004, and that were completed in various years between 1999 and 2005. This initial pool was developed to reflect the Commission's current strategic funding priorities for infrastructure projects, and to represent projects from each of the 13 Appalachian states. ARC also wanted to discern unforeseen impacts, trends among types of projects and to assess the wider economic impacts in the local communities. The initial pool was narrowed to 104 projects for the final report, representing 91 different project impact areas.[i] The project evaluation focuses on key performance measurements and outcomes:

- The number of jobs projected and actually created or retained upon project completion;
- Leveraging rates for other project-related funds, including state, local, other federal and private investment;
- Determination of the agency's relative funding contribution;
- Calculation of the job creation rate attributable to ARC's investment once the impact other funds is considered;
- Diversification effects of the projects on the local economic base;
- Indirect and induced economic effects attributable to the project;
- 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 housing and water and sewer projects.

1.3 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.

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:

- Increase job opportunities and per capita income in Appalachia to reach parity with the nation
- Strengthen the capacity of the people of Appalachia to compete in the global economy
- Develop and improve Appalachia's infrastructure to make the Region economically competitive
- Build the Appalachian Development Highway System to reduce Appalachia's isolation

In general, the projects that were evaluated relate to the goals set forth in the Commission's strategic plan, with a focus on the first and third. The new housing and telecommunications project categories address community, as well as economic development objectives, as well as work force development objectives.

The sample projects are distributed over 13 states and represent more than 90 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. [iii] (An additional class of "at-risk" counties is utilized to differentiate among transitional areas, but is not used for funding eligibility purposes.) Projects in distressed counties are eligible for 80 percent ARC funding, transitional for 50 percent and competitive for 30 percent, while attainment counties are generally 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 six basic categories for the purposes of this report: access roads, industrial parks, industrial sites, business incubators, water/sewer, telecommunications and housing projects. These classifications were developed to enhance the analysis of projects, but the classifications are subject to some overlap. [iii]

All projects in four categories—access roads, industrial parks, industrial sites and business incubators— were considered economic development projects. Water and sewer projects were divided among economic development and residential development projects, as are telecommunications projects. For purposes of clarity in the economic impact analysis (Chapter 3), residential projects were further divided into (a) community development projects and (b) housing development projects. The reason for this is to separate non-economic development water and sewer, and telecommunications projects, where impacts may be widespread in a community and may also foster job creation, from projects that are solely designed to provide specific housing units. Project counts are summarized below by classification:

Industrial Parks: Twenty-one industrial park projects (20 percent of the sample) accounted for 21 percent of the total ARC investment reflected in the sample. Industrial park project grants tended to be very slightly larger than the average sample project.

Industrial Sites: Twelve industrial site projects (12 percent of the sample) accounted for 11 percent of the total ARC investment reflected in the sample. Industrial site project grants tended to be slightly smaller than the average sample project.

Business Incubators: Five business incubator projects (5 percent of the total analyzed sample) accounted for 6 percent of the total ARC investment reflected in the database. Business incubator projects were on average significantly larger than the representative sample project.

Access Roads: Three access road projects (3 percent of the sample) accounted for 2 percent of the total ARC investment reflected in the sample. Industrial access road project grants tended to be smaller than the average sample project.

Water/Sewer Projects: Fifty-one water and sewer projects (49 percent of the sample) accounted for 53 percent of the total ARC investment reflected in the sample. Water and sewer projects tended to be larger than the average sample project. Nineteen of the water/sewer projects were residentially-focused 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. [iv]

Housing: Housing projects accounted for four projects in the sample (4 per cent), and 2 per cent of the total investment in the project sample pool. Housing investments were significantly smaller, on average, than the typical ARC investment.

Eight telecommunications projects accounted for 8 per cent of the sample and five per cent of the total investment in the sample pool. The typical project in this category was also smaller than the average project overall.
[v]

During the course of the analysis, it became clear that the classification of several projects was ambiguous, and that a handful was probably misclassified. For example, a telecommunications project in an incubator might be classified as either, and the assignment of water-sewer classifications to industrial park projects seemed like a very gray area. One incubator project appeared to us to be more of a multi-tenant industrial site re-use, etc. To adjust these in mid-course would have required policy discussions and revisions that are beyond the scope of this project. As a result, we maintained all of the original classifications and mentioned discrepancies only where they are germane to the discussion.

Similarly, we used the original projections for all projects, even those that were essentially planning or feasibility, where projections for new jobs or households served had been originally made by the applicant. These (two) cases are noted in the discussion, and calculations affecting investment costs and returns are discussed both with and without the outcomes utilized for pure planning projects.

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 414 projects were developed, completed and closed from 1998 to 2004. Thus, the final sample of 104 projects represents 25 percent of all closed 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. New categories, such as housing and telecommunications, were included on a disproportionate basis in order to develop an initial category assessment with reasonable critical mass. Some categories were also excluded due to diminishing interest of many states (e.g., downtown revitalization projects). 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.

1.4 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. Interviews were conducted for each project, most often with local or regional development staff, local government and civic leadership and private sector representatives.

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. Interviews lasted from 20-45 minutes, and the focus of discussion often varied based on the responses of the interviewees. In some cases, multiple interviews were conducted with one or more local stakeholders.

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 interview instrument itself can be found in Appendix I.

In addition to phone interviews, six 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 primary project impact area. 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. [vi] In general, however, the baseline economic analyses situate 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 ratios 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. Several 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 an 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 public understanding of the benefits of ARC's infrastructure investments.

1.5 Overview of Report

The remainder of this report is organized in six more chapters and is supported by 9 appendices, seven printed and two electronic.

Chapter 2 presents the 104 projects that are in the sample for this evaluation.

Chapters 3 and 4 evaluates the economic impact of projects by classification (economic development and residential), state, project type and county designation. Chapter 3 concentrates on documenting the benefit cost of ARC investments as well as overall as indirect and induced impacts. Chapter 4 analyzes outcomes by project type.

Chapter 5 examines localized project impacts by county and Chapter 6 analyzes the impacts of ARC projects in the context of economic conditions of project areas.

Chapter 7 presents observations and recommendations by the consulting team. These are cumulative, incorporating recommendations made in the 2000 program evaluation.

This study includes the following appendices:

- Appendix A: Site Visit Narratives [iv]
- Appendix B: Methodology of Project Selection
- Appendix C: Methodology of the Impact Analysis
- Appendix D: Methodology of the Economic Vitality Analysis
- Appendix E: Methodology of Distressed County Analysis
- Appendix F: Project List
- Appendix G: Contact List
- Appendix H: Database and Project Thumbnails (Electronic)
- Appendix I: Economic Vitality Analysis Detail (Electronic)

Notes

[i] 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.

[ii] 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. In FY 2007 ARC converted its standard economic indicators into an index-based system.

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

[iv] Residential projects met ARC criteria for investment in community-projects. In the case of projects that primarily serve *residential households*, the *outcome measure* is the number of *households served*. These households must be in counties that are designated by ARC as “distressed” or show compelling need, such as the location of the project in a “distressed county” of a transitional county, as disaster relief or to address a mandate of the Federal EPA or a state health or environmental agency. See Appendix H for definitions of economic status by county, and Appendix A of ARC Project Guidelines:
<http://www.arc.gov/index.do?nodeId=1028#Residential>.

[v] Both the Housing and Telecommunications project categories were new to this evaluation, and were not included in the prior (2000) assessment of Infrastructure Project Program impacts.

[vi] Six full site visits and two drive-by visits were conducted to supplement the evaluation derived from written records and phone interviews.

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.

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 representative of the Region as a whole, slightly weighted toward non-metro areas;
- Includes project counties reflecting all eligible economic designations, with weight given to distressed counties;
- Incorporates a robust distribution of projects in the major project classifications - water/ sewer, access road, industrial park and site, business incubator, telecommunications and housing;
- Includes a majority of water and sewer projects, reflecting the mix of the universe of project investments; and
- Includes both very small and very large investments, in addition to many of “average” scale.

2.1 Project Types

Of the 104 projects analyzed, 78 (75%) included primary objectives directly related to economic development, while the remainder involved housing, telecommunications or water-sewer projects that related only to residential or quality-of-life objectives. Thirty-two water and sewer projects (of 51) were directly related to economic development, by design or outcome or both. Six of eight telecommunications also included direct economic development objectives. 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 104 projects:

- 51 water/sewer projects
- 21 industrial parks

- 12 industrial sites
- 5 business incubators
- 3 access roads
- 8 telecommunications
- 4 housing

2.2 Project Locations

There is a reasonable spread of project types in various states as shown in Table 2.1. All states include at least one water-sewer project. The five incubator projects are in five different states. Despite concentrations in Pennsylvania and Tennessee, nine different states host the 33 industrial park and site projects. The eight telecommunications projects are in five different states. Only the housing projects are concentrated in a single state; all four are in KY, and this is simply due to the fact that only KY housing projects were funded as the category was initially tested by ARC.

Because the ARC project award process is commonly 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.

Table 2.1 Project Spread by State and Type							
	Access	Incubator	Ind. Park & Ind. Site	Telecomm	Water- Sewer	Housing	Total
AL		1	2		6		9
GA			3	1	4		8
KY			4		11	4	19
MD			3	2	1		6
MS	1	1	1	1	5		9
NC				2	7		9
NY	2				3		5
OH		1	4		2		7
PA		1	7	1	1		10
SC					2		2
TN			6	1	4		11
VA		1			2		3
WV			3		3		6
Total	3	5	33	8	51	4	104

For the most part, it is difficult to meaningfully identify regional project preferences. North Carolina, for example, shows a “preference” for water and sewer projects, but since every one of the seven included economic development outcomes, it is not particularly useful to separate this category from industrial site development as a local “preference”.

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

Of 410 ARC counties, 109 counties (27%) were classified as metropolitan in the 1999 census designations; which were used as the “pre-project” designations for this report. The other 301 counties are classified as non-metropolitan. Twenty-six sample projects (25%) were developed in metropolitan ARC counties, while 71 projects (68%) were entirely within rural counties. Seven projects were developed in areas with both metro-based and rural counties. Clearly, the sample was closely aligned with the balance of metro/rural counties within the Region. Of the metro county sample projects, only two (both in Fayette County, PA) was in a metro area county designated as distressed prior to project development.

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. Three states—Alabama, Georgia and South Carolina—funded projects in metro areas at a considerably higher rate than the Regional distribution of metro area counties. (This was true of South Carolina in the 2000 evaluation as well.)

Table 2.2 Project Spread by Metro-Rural Designation							
	Metro	Rural	Both	Total	% Metro	% Rural	% Both
AL	4	5	0	9	44%	56%	0%
GA	4	3	1	8	50%	38%	13%
KY	0	18	1	19	0%	95%	5%
MD	2	1	3	6	33%	17%	50%
MS	0	9	0	9	0%	100%	0%
NC	3	5	1	9	33%	56%	11%
NY	2	3	0	5	40%	60%	0%
OH	1	6	0	7	14%	86%	0%
PA	5	5	0	10	50%	50%	0%
SC	2	0	0	2	100%	0%	0%
TN	3	8	0	11	27%	73%	0%
VA	0	3	0	3	0%	0%	0%
WV	0	5	1	6	0%	83%	17%
Total Sample	26	71	7	104	25%	68%	6%
Region	109	301	n/a	410	27%	73%	n/a

Note: Classifications reflect 1999 Census designations

Among the metropolitan projects, twelve of the 26 were water/sewer, eight were industrial park, four were industrial site, one was an access road and a business incubator project. (The proportion of metro incubator and access road projects was down from the 2000 review.) The increased emphasis on rural incubators reflects a need for focus on entrepreneurship that was identified in the original study, despite a continuing lag in the Region's start-up activity, as discussed later in the report (see Section 6).

In the final sample pool, 74% of all projects were located in either rural or mixed metro-rural areas, while in the region overall, the percentage of rural counties is 73%.

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 410 counties in the Appalachian Region, with each county assigned to one of five economic categories: distressed, transitional, transitional/at-risk, competitive, or attainment. Multi-county project areas may also be assigned combination indicators, including multi-county with no distressed county, and multi-county with 1+ distressed counties.

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 those with a poverty rate and a three-year unemployment average of 150% of the United States average and a per capita income that is 67% or less of the national average (or if a county poverty rate is twice the national poverty rate then it only needs to meet one other of these distress criteria). ARC classifies counties as "transitional" if one or more of these indicators are worse than the U.S. average. The third type of county where projects in this evaluation are located are "competitive" counties, where the rates of poverty are even or less than the US average, unemployment rates are 100% or less of U.S. average and per capita income is at least 80% of the national average. 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.¹

The economic status of project counties was evaluated for the sample and compared with the distribution for the Appalachian Region as a whole.

¹ In FY 2007 ARC converted its standard economic indicators into an index-based system.

Of the 410 ARC counties, 91 (25 percent) were classified as distressed in the FY 2004 ARC designation, 289 (70 percent) as transitional, 22 (5 percent) competitive, and eight (2 percent) as attainment.

Among the 104 projects evaluated, 36 project impact areas were classified as either distressed single counties prior to project development; another eight projects were in multi-county impact clusters that included at least one distressed county. As a result, 42% of all projects in the sample included distressed county impacts. An additional 50 projects (48%) were located in transitional counties. By 2004, 16 of the areas designated with distressed had moved to higher classifications, usually transitional or at-risk. Results among these areas are discussed more fully in later in the report (Section 5.7 Distressed Community Impacts).

As a matter of ARC policy, no projects were developed in “attainment” counties. Project impacts on distressed counties are discussed more fully in section 5.2.

2.5 Project Budget Levels

The total ARC investment in the 104 reviewed projects was \$29,413,336. For the most part, original ARC allocations were maintained, even when project costs increased. The average ARC project investment was just over \$282,100. Individual project investments ranged from \$10,265 to \$1,160,000 million. The median investment was \$200,000.

The total ARC investment in projects areas with distressed counties was \$14,041,332 or 48% of the total ARC investment (up from 20% in the prior evaluation). Of this, more than \$11 million went to projects directly based in individual distressed counties. Transitional counties accounted for \$13,651,781 (46 percent) of the investment represented by the database.

Non-metropolitan counties in the ARC Region accounted for \$22,540,440 or 77 percent of the total ARC investment in the project sample. Metropolitan ARC counties received \$6,872,896 or 23 percent of the investment represented in the sample (compared to 27% in metro areas in the 2000 evaluation). Two of the metro area projects (total investment: \$544,000) were in a distressed county. The percentage of non-metro investment is slightly higher than the proportion of non-metro Regional counties overall.

3. Overall Economic Impact Measures

To accurately measure the overall impacts of ARC's infrastructure and public works projects, it is important to understand the context and objectives of the different types of programs that are addressed in this evaluation. For these purposes, the 104 projects studied in this evaluation are organized into three categories, as reported below.

- ***Economic development projects:*** Investment made for projects in this category is intended to promote business development by attracting new jobs and save existing jobs that are in danger of being lost. Seventy-eight of the 104 projects are counted in this category.
- ***Community development projects:*** The objective of public investment made in this category is to improve basic health and/or quality of life in a community. In most cases these goals were met through providing water and sewer services to communities or by enhancing telecommunications. Though the principal objectives of these projects were not aimed at attracting investment, improvements in basic infrastructure often enhanced the attractiveness of areas for private sector business investment and housing investment. Twenty-two projects are counted in this category.
- ***Housing Development:*** The objective of public investment in this category is to construct or rehabilitate housing for low- and moderate-income residents. These projects do not generate jobs. Four projects are counted in this category.

Measurements Used. For the 78 economic development projects, project impacts are 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. In addition, these measurements, along with the number of households served, are reported in the impact analysis of the 22 community development projects. The impacts of the four housing development projects are also reported in terms of households served.

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. Results show that actual impacts approach, but do not match, projections for retained businesses served, new jobs, and retained jobs. These aggregate results are generally linked to the performance of a handful of large projects that for a variety of reasons have not matured in the three to five years since ARC investments were expended.

Job and Business Development. Overall, 70% of economic development and community development projects met or exceeded expected generation of new jobs, including 55 of 78 economic development projects and one of two community development projects. Twenty community development projects and the four housing development projects did not submit projections of jobs created with their applications.

In total, 87% of predicted new jobs have been realized to date for economic development projects. Two of the projects, one for an industrial site and the other for an industrial park, were funded for planning and engineering. To date, these projects have not been developed. [i] Discounting them, the percent of direct job attainment would be 92% for the seventy-six other economic development projects.

Another reason that job generation falls short of predictions is that seven other industrial park projects projected to generate a cumulative 9,485 jobs have generated only 2,119 jobs to date, a shortfall of 7,366 jobs. The cumulative shortfall of new jobs for the 78 economic development projects is 2,735. Interviews concerning several of the industrial park projects mentioned above indicate that crucial supporting infrastructure development needed to attract private investment trailed the ARC funded project in implementation. These additional infrastructure developments are now underway or were recently completed. Additionally, two of these industrial park projects ran into unforeseen environmental issues during construction and must be reduced in size. Further discussion of these and other industrial park projects is provided in Chapter 4.

The relationship of retained businesses served (102% of expectations²) to jobs saved (88%) indicates that ARC investments were able to prevent local business closures; however, they were unable to protect all of the jobs in those businesses, at least in the short-term.

Data gathered from community development projects shows that the number of businesses served and jobs saved fell short of predicted outcomes due to the slow ramp-up of one of two projects that predicted job impacts.

² In other words, after projects were completed, more businesses said that they remained at their current locations because of ARC projects, than were predicted to relocate or close if the projects were not implemented. Of the evaluation sample, five projects reported retaining more businesses than anticipated (projects in NY, SC, MD, NC and PA) and two projects reported retaining fewer businesses (in NY and MD).

Households Served. Through review and evaluation of 22 community development and four housing development projects, 84% of projected new households served were documented, though 100% of existing households predicted to benefit were served. Overall, 17 of 22 (77%) community development projects met or exceeded expectations for additional households served. In this category too, one of the funded water and sewer projects was to fund administrative and design work; though the ARC part of the project has successfully been completed, the water infrastructure is not yet built. If this project were excluded, the result would be 88% of new households served for 21 projects. Two other projects account for more than 1,000 households falling below predictions for being served (1,194 households projected and 150 served). It is important to look at the contexts in order to understand the outcomes of these projects. First, implementation of a water and sewer project was delayed because the construction company went bankrupt, but this project is back on track. Though delivery is delayed, this project is expected to produce anticipated benefits. Second, implementation of a telecommunications development led other service providers to offer internet services in the project area. As a result, the community benefit was not derived directly through the ARC-funded project.

Housing development projects served 95% of predicted new households. In this case, three of four projects met expectations; the other fell short because significantly less federal, state and local dollars were spent than originally planned. Nonetheless, project proponents consider the outcome successful; the new housing broadened the local tax base, and it has improved quality of life for the many families that didn't have heating systems, potable water and sanitary facilities, or water in their houses.

Table 3.1 below presents aggregate measures for core outcomes of economic development, community development and housing development projects

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	391	581	151%
Retained businesses served	126	128	102%
New jobs	20,380	17,645	87%
Retained jobs	10,847	9,580	88%
<u>Community Development Projects</u>			
New households served	5,620	4,703	84%
Existing households served	871	871	100%
<u>Housing Projects</u>			
New households served	210	200	95%

These findings for economic development projects and retained jobs are noteworthy for two reasons. First, 71% of all economic development projects met or exceeded their goals, and high percentages of expected jobs were created (87%) and retained (88%), despite several large projects that have not yet generated anticipated results. Commission investments do not always require a guarantee of job creation before granting the funds, so projections of job impact can be somewhat speculative. Second, applicants may be inclined to “stretch the envelope” on job projections in order to enhance the perceived likelihood of project funding. Throughout the evaluation process, including reviews of project closeout documents and interviews with project proponents and other local economic development representatives, there were no indications that regional jobs were relocated to account for the created job outcomes.

In the analysis, reported results from economic development, community development and housing development projects are compared to expected outcomes at application stages of ARC grants. Consequently, these results should be seen as based on fairly rigorous success standards; several types of project outcomes are considered to have fallen short of meeting or exceeding expected outcomes:

- Projects that approached but did not reach projections;
- Projects that had large impacts but nonetheless fell below projections;
- Projects such as recent industrial parks that are still in “immature” stages; and
- ARC grants that fund planning related work, but where implementation of projects relies exclusively on other agencies.

Though not primary measures for accomplishments, some economic development projects reported households served and community development projects reported new and retained jobs and businesses. This is because a portion of water and sewer projects are classified as “economic development,” consistent with these projects’ primary objectives, and these projects provide services to households. Other water and sewer construction, as well as access road and telecommunications projects that are classified as community development projects attracted businesses due to the new or improved infrastructure. [iii] These additional accomplishments are summarized below:

- 13 economic development projects reported serving 6,732 new households;
- 5 economic development projects reported serving 4,352 existing households (4 of these projects also serviced new households); and
- 2 community development projects reported 19 new businesses served and 150 jobs created.

It is 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; this did not seem to be the case for the sample reviewed for this report. Moreover, unlike the previous study, which funded sewer improvements to support a new BMW plant, this evaluation did not include a single project of that magnitude (although the impacts of the Huntsville Research Park were quite large).

Results by State. As Table 3.2 indicates, the results on businesses, jobs and households served is largely a reflection of 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. For example, housing development projects will have a positive impact on “households served” and zero job impacts. Water and sewer projects in the community development category will lag behind industrial park development in job creation or businesses served.

State-by-state characteristics are useful in the review of individual projects within the context of a state’s total ARC program portfolio. Within each state, the number and dollar value of total investments varied, as did the impacts generated from the projects. For example, Kentucky’s 19 projects included four housing development and 11 water and sewer projects. By contrast, seven of 10 projects in Pennsylvania were to support development of industrial parks or industrial sites; another project funded site plans for an industrial park. Maryland’s projects included include two for telecommunications, and in Alabama seven of nine projects were investments in water and sewer systems. The types of projects reflect state priorities that determined both the scale of required investment and the nature of outcomes.

Table 3.2 Direct Impact: Results by State							
	No.	ARC Investment	Businesses Served	Businesses Retained	New Jobs	Retained Jobs	Households Served
Alabama**	9	\$1,805,085	45	6	4,999	353	2,341
Georgia	8	\$1,826,112	18	2	620	69	150
Kentucky *	19	\$5,815,568	187	8	1,425	660	9,741
Maryland	6	\$1,764,971	21	2	285	1,666	1,000
Mississippi	9	\$1,857,537	13	6	1,670	150	921
North Carolina	9	\$1,584,289	65	10	806	2,100	200
New York	5	\$900,000	4	62	105	1,657	145
Ohio	7	\$2,300,000	30	1	347	46	83
Pennsylvania	10	\$1,650,134	129	5	2,309	764	55
South Carolina	2	\$1,500,000	6	7	1,705	1,800	0
Tennessee	11	\$3,563,496	6	7	1,918	40	903
Virginia	3	\$1,035,000	23	20	320	100	405
West Virginia	6	\$3,811,144	68	0	1,286	175	914
Total	104	\$29,413,336	615	136	17,795	9,580	16,858

** Includes 4,040 direct jobs from the Huntsville (AL) Research Park.

* Excludes 75 hospital jobs added following replacement of the Jackson Water Storage Tank in Jackson, Kentucky due to ambiguous causality between the project and new jobs. This project is listed in the

“community development” category and is located in a single distressed-county. Exclusion is consistent throughout tables.

3.2 Indirect and Induced Effects

“Direct effects” refer to the growth of businesses located at the project site that benefit directly from the project completion, and “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 generally lead to “new” jobs and income, and the latter generally 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).

Together, 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 replacing jobs and income from existing business activities.

Indirect and induced impacts were not calculated for retained activity. Following the methodology of the previous evaluation, 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 multiplier impact—leading to additional job loss for existing businesses elsewhere in the local area. Nonetheless, to be conservative, indirect and induced effects to retained businesses and jobs were not attributed due to the uncertainty of the scale of losses and resultant multiplier that would occur without public investment.

Methodology for Analysis: When possible, measures of direct, on-site impacts of business attraction and retention came directly from interviews with local officials, who were asked to report the actual number of affected businesses and jobs. They were also asked to estimate associated personal income, including existing or saved jobs. For cases without reliable estimates of income effects, data from the state labor agency and the US Department of Commerce were used to indicate the average wage per worker (based on data by county and by industry). The measures of indirect and induced effects were developed using the IMPLAN modeling package.³

Multiplier effects differ by industry, by state and by county. Business can generate varying levels of indirect and induced effects depending on the portions of dollars going to pay workers, and to buy different types of equipment and supplies. In addition, the impacts based on specific locations vary, depending on the portion of suppliers and consumer-serving businesses located within each county. For these reasons, multipliers were calculated for each of the counties associated with the 104 projects studied. In cases in which projects involved multiple counties, impacts were estimated for the multi-county area. For each project, the types of industry associated with the business expansion or attraction were identified, and the applicable multipliers were then applied. (See Appendix C for further discussion of indirect and induced methodology applied to this study.)

³ IMPLAN stands for “Impact Analysis for Planning” and 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 509 industries, and is based on categories of the US Bureau of Economic Analysis (BEA), which correspond to 2 to 5-digit groups in the North American Industrial classification System (NAICS).

3.3 Job Impacts: Direct, Indirect and Induced Effects

New Jobs. A total of 17,795 new jobs were directly created as a result of the ARC-funded projects. These direct effects only include jobs at the sites served directly by the ARC-funded infrastructure and public works investments. In addition, it is estimated that another 25,341 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. All of these new jobs (both direct and indirect/induced effects) were created because of the projects.

Retained Jobs. Another 9,580 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 pre-dated the projects' that were implemented. If the projects had not been implemented with 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 is 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 and induced effects based on new jobs, but not any additional indirect and induced effects based on retained jobs.

Total Jobs. The estimated total number of job impacts of the ARC-funded sample projects was 43,136. This estimate includes direct new jobs, and indirect and induced new jobs. It does not include the retained jobs, or estimates of the multiplier effects for retained jobs. It also does not include construction job years for housing and rehabilitation work. The total impact can be broken down by project type, as follows:

- 22,815 total jobs created from 21 industrial park projects (average of 1,086 each);
- 2,583 jobs created from 12 industrial site projects (average of 123 each);
- 1,357 total jobs created from 5 business incubator projects (average of 271 each);
- 636 jobs created from 3 access road projects (average of 212 each);
- 15,515 jobs created from 51 water/sewer projects (average of 304 each, or 485 each if calculated using only the 32 economic development projects in this classification) and;
- 230 jobs created from 8 telecommunications projects (average of 29 each)

Table 3.3 Total Overall Jobs Impacts by Project Type, Area Rating and State					
	No. of Projects	Retained Jobs	Direct New Jobs	Indirect & Induced jobs	Direct, Indirect & Induced Jobs
Project Type					
Access Road	3	1,185	200	436	636
Business Incubator	5	115	688	669	1,357
*Industrial Park	21	968	8,812	14,003	22,815
Industrial Site	12	152	1,001	1,582	2,583
Telecommunications	8	0	128	102	230
Water/Sewer	51	7,160	6,966	8,549	15,515
Housing Development	4	0	0	0	0
Total	104	9,580	17,795	25,341	43,136
Area Rating (pre-project)					
Multi-County with 1+ Distressed County	8	350	726	396	1,122
Multi-County with No Distressed County	3	0	225	334	559
*Single Competitive	5	1,300	5,940	8,735	14,675
Single Distressed	36	718	2,457	3,687	6,144
Single Transitional	52	7,212	8,447	12,189	20,636
Total	104	9,580	17,795	25,341	43,136
State					
*Alabama	9	353	4,999	4,172	9,171
Georgia	8	69	620	674	1,294
Kentucky	19	660	1,425	1,126	2,551
Maryland	6	1,666	285	249	534
Mississippi	9	150	1,670	3,383	5,053
North Carolina	9	2,100	806	820	1,626
New York	5	1,657	105	216	321
Ohio	7	46	347	382	729
Pennsylvania	10	764	2,309	6,459	8,768
South Carolina	2	1,800	1,705	2,272	3,977
Tennessee	11	40	1,918	3,252	5,170
Virginia	3	100	320	148	468
West Virginia	6	175	1,286	2,188	3,474
Total	104	9,580	17,795	25,341	43,136

* Includes 4,040 direct jobs from Huntsville (AL) Research Park .

Impacts on Areas of Economic Distress. The ARC projects in this evaluation are concentrated in distressed and transitional jurisdictions. These are the ARC counties experiencing the greatest extent of poverty in Appalachia, as described

in section 2.4. Ninety-nine of the 104 projects evaluated were in distressed or transitional counties, and generated the following impacts:

- 44 projects in distressed counties created 7,266 new jobs (direct, indirect and induced) and supported the retention of 1,068 jobs; [iii] and
- 55 projects in transitional counties created 21,195 jobs (direct, indirect and induced) and supported the retention of an additional 7,212 jobs [iv]

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 on the previous page. 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 counties, and greater again for projects in more competitive counties. That reflects a combination of three factors:

- Attracting business is harder in the more distressed counties; hence the average number of jobs created per project is smaller in those areas; and
- 21 of the 26 community and housing development projects were in the distressed counties and were aimed at public health providing housing rather than immediate economic development.
- Localized multiplier impacts are higher in areas with more developed economies than in areas of greater economic distress. This is because more local establishments are available in stronger economies to be business suppliers and to attract consumer spending.

3.4 Personal Income: Direct, Indirect and Induced Effects

Additional Income. 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.

Overall Results. Table 3.4 shows a breakdown of the retained wages as well as the new (direct) wage income and indirect and induced income impacts, by project type, county classification and state. Overall, the 100 projects in this evaluation (excluding the four housing development projects) led to \$1.3 billion dollars of new wages annually, of which \$639 million are from jobs directly attributable to ARC projects; \$693 million are attributable to additional business spending (indirect) and consumer spending (induced) generated by projects.

Of these impacts, direct jobs from the 78 economic development projects generated \$634 in annual wages and an additional \$692 million from indirect and induced effects. In addition, these economic development projects helped to directly retain \$325 million in existing wages for threatened jobs in the ARC region. Industrial park projects led to more than half of the new wages, while water and sewer projects were responsible for more than 70% of retained personal income.

As with jobs, wage impacts are disproportionately seen in transitional and competitive counties. The proportion of personal income in distressed counties of Appalachia is 19% of direct impacts of new jobs and 16% of impacts when factoring in indirect and induced effects. As discussed above, distressed regions have smaller economies than either transitional or competitive counties, and therefore have fewer opportunities to benefit by indirect and induced spin-off impacts of business-to-business sales and consumer spending. Overall, 45% of direct wage impacts from new jobs are in transitional counties, and 37% are in competitive counties. After indirect and induced impacts are factored, the share of total personal income in competitive counties rises to 39% and remains at 45% in transitional counties. Roughly 77% of retained wages are in transitional counties.

Wage Levels. The new jobs directly generated by these ARC-funded projects were primarily industrial rather than commercial or service jobs. Average wages are about \$36,000 for direct jobs; wages derived from indirect and induced impacts pay an average of \$27,000. Data did not distinguish levels of part-time and full-time jobs, or benefits packages, if any, associated with these jobs. As found in the evaluation of ARC programs in 2000, however, local interviews reveal a clear consensus that the ARC-funded projects had indeed broadened available job opportunities and provided desirable types of jobs.

Table 3.4 Total Overall Personal Income Impacts					
Project Type	No. of Projects	Income from Retained Jobs	Direct Income	Indirect/Induced Income	Direct, Indirect & Induced Income
Access Road	3	\$49,980,899	\$7,666,122	\$12,009,189	\$19,675,311
Business Incubator	5	\$2,425,439	\$15,403,157	\$15,497,914	\$30,901,070
Housing Development	4	\$0	\$0	\$0	\$0
*Industrial Park	21	\$27,180,890	\$329,205,192	\$403,202,608	\$732,407,800
Industrial Site	12	\$4,339,482	\$29,905,609	\$39,652,508	\$69,558,117
Telecommunications	8	\$0	\$2,577,679	\$2,178,604	\$4,756,284
Water/Sewer	51	\$241,304,313	\$254,017,375	\$220,523,916	\$474,541,293
Total	104	\$325,231,023	\$638,775,134	\$693,064,739	\$1,331,839,875
Area Rating (pre-project)					
Multi-County with 1+ Distressed County	8	\$18,333,153	\$32,550,525	\$9,265,954	\$41,816,479
Multi-County with No Distressed County	3	\$0	\$8,422,808	\$8,745,840	\$17,168,648
*Single Competitive	5	\$36,113,090	\$233,951,301	\$283,697,239	\$517,648,539
Single Distressed	36	\$19,789,666	\$87,170,042	\$80,611,568	\$167,781,608
Single Transitional	52	\$250,995,114	\$276,680,458	\$310,744,138	\$587,424,601
Total	104	\$325,231,023	\$638,775,134	\$693,064,739	\$1,331,839,875
State					
*Alabama	9	\$9,589,021	\$189,280,909	\$152,442,708	\$341,723,619
Georgia	8	\$1,128,419	\$19,912,557	\$16,593,807	\$36,506,365
Kentucky	19	\$27,200,568	\$65,296,165	\$22,670,969	\$87,967,134
Maryland	6	\$69,503,190	\$6,577,520	\$7,761,135	\$14,338,655
Mississippi	9	\$5,314,310	\$58,210,662	\$96,771,836	\$154,982,497
North Carolina	9	\$60,177,101	\$20,013,491	\$19,392,254	\$39,405,745
New York	5	\$62,171,853	\$4,065,290	\$6,384,966	\$10,450,257
Ohio	7	\$1,486,184	\$9,640,784	\$7,923,434	\$17,564,218
Pennsylvania	10	\$20,760,732	\$93,637,808	\$183,338,089	\$276,975,897
South Carolina	2	\$58,180,889	\$58,342,080	\$52,293,193	\$110,635,272
Tennessee	11	\$1,021,488	\$59,749,557	\$72,089,644	\$131,839,201
Virginia	3	\$1,906,919	\$6,102,140	\$4,040,038	\$10,142,178
West Virginia	6	\$6,790,349	\$47,946,171	\$51,362,666	\$99,308,837
Total	104	\$325,231,023	\$638,775,134	\$693,064,739	\$1,331,839,875

* Includes 4,040 direct jobs \$155.3 million direct income from Huntsville (AL) Research Park .

3.5 Effects on Public and Private Investment

Overview. ARC does not fully fund any infrastructure or public works projects. Rather, ARC participates in projects which also have some other federal funding assistance. The other federal funding is predominantly from the Economic Development Administration, Rural Development of the U.S. Department of Agriculture, the U.S. Department of Housing and Urban Development, or the Federal Highway Administration of the U.S. Department of Transportation. Most of these other federal programs also require some state or local matching funds. This section reviews such funding patterns in two parts. First, the mix of public funding is described. Then the leveraging of private sector funding is analyzed.

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 \$29.4 million, which is 17% of the total public cost for these projects (\$172.7 million). Other federal funding averaged 20% of project cost, while states invested an average of 18%, and local funding averaged 45% of the total.

Viewed another way, each dollar of ARC investment helped to make possible a package of \$4.87 in other public funding, adding up to \$5.87 of total public funding. A full breakdown of the public funding by project type, area distress level, and state is shown in Table 3.5.

Overall, the ARC portion of total public funding was:

- 32% of all public funding for access road projects;
- 22% of all funding for business incubator projects;
- 14% of all public funding for industrial park projects;
- 20% of all public funding for industrial site projects;
- 37% of all public funding for telecommunications projects;
- 17% of all public funding for water/sewer projects serving business sites (14% for projects classified as “economic development” and 27% for “community development” projects); and
- 8% of all public funding for housing development.

The ARC portion of the total mix of public funding was 18% for projects in distressed counties, 18% for projects in transitional areas and 8% in competitive areas. All together, these figures show that ARC funding has played a relatively larger role in those areas that are most in need, and in basic infrastructure

projects critical to households and business operations, such as water, sewer, roadways and telecommunication services.

Table 3-5. Total Public Investment Made						
Project Type	No. of Projects	ARC \$	Federal \$	State \$	Local \$	Total Public \$
Access Road	3	\$599,100	\$0	\$900,000	\$383,538	\$1,882,638
Business Incubator	5	\$1,777,500	\$2,552,588	\$30,000	\$3,704,521	\$8,064,609
Housing Development	4	\$633,848	\$3,950,352	\$1,464,791	\$1,796,051	\$7,845,042
*Industrial Park	21	\$6,106,020	\$8,458,241	\$6,542,029	\$22,354,341	\$43,460,632
Industrial Site	12	\$3,329,843	\$288,000	\$1,143,000	\$12,279,530	\$17,040,373
Telecommunications	8	\$1,345,759	\$1,000,000	\$196,712	\$1,061,663	\$3,604,133
Water/Sewer	51	\$15,621,266	\$18,148,900	\$21,221,320	\$35,851,378	\$90,842,864
Total	104	\$29,413,336	\$34,398,081	\$31,497,852	\$77,431,021	\$172,740,290
<u>Area Rating (pre-project)</u>						
Multi-County with 1+ Distressed County	8	\$3,035,665	\$6,969,947	\$6,977,568	\$5,092,604	\$22,075,784
Multi-County with No Distressed County	3	\$646,971	\$0	\$43,139	\$720,826	\$1,410,936
*Single Competitive	5	\$1,073,251	\$500,000	\$1,242,400	\$11,282,725	\$14,098,376
Single Distressed	36	\$11,005,667	\$11,344,118	\$14,700,464	\$19,727,848	\$56,778,098
Single Transitional	52	\$13,651,781	\$15,584,016	\$8,534,281	\$40,607,018	\$78,377,096
Total	104	\$29,413,336	\$34,398,081	\$31,497,852	\$77,431,021	\$172,740,290
<u>State</u>						
*Alabama	9	\$1,805,085	\$1,030,000	\$550,000	\$7,425,333	\$10,810,418
Georgia	8	\$1,826,112	\$579,348	\$1,118,305	\$3,420,320	\$6,944,085
Kentucky	19	\$5,815,568	\$15,699,952	\$13,525,738	\$9,348,373	\$44,389,631
Maryland	6	\$1,764,971	\$600,000	\$336,139	\$2,678,118	\$5,379,228
Mississippi	9	\$1,857,537	\$0	\$496,212	\$10,809,534	\$13,163,283
North Carolina	9	\$1,584,289	\$2,000,000	\$1,517,583	\$3,680,602	\$8,782,474
New York	5	\$900,000	\$1,305,200	\$1,100,000	\$1,603,886	\$4,909,086
Ohio	7	\$2,300,000	\$3,785,363	\$2,090,345	\$5,152,299	\$13,328,007
Pennsylvania	10	\$1,650,134	\$2,675,000	\$1,790,700	\$10,333,075	\$16,448,909
South Carolina	2	\$1,500,000	\$2,746,500	\$0	\$8,999,700	\$13,246,200
Tennessee	11	\$3,563,496	\$1,700,600	\$1,320,000	\$9,784,144	\$16,368,240
Virginia	3	\$1,035,000	\$0	\$1,480,000	\$673,268	\$3,188,268
West Virginia	6	\$3,811,144	\$2,276,118	\$6,172,830	\$3,522,370	\$15,782,462
Total	104	\$29,413,336	\$34,398,081	\$31,497,852	\$77,431,021	\$172,740,290

Private Investment Leveraged. Of the 78 economic development projects, 27 were initiated with records of commitments for private sector investment. The related private sector investment from these 27 projects at the time of project application was \$319 million. An additional \$68 million was anticipated for a

single community development water and sewer project. Local interviews and data collection conducted for this project showed that these projects actually engendered significantly larger private investment at project sites than projected. Direct investment for new or renovated buildings and other business facilities totaled \$942 million for the 27 economic development projects, nearly three times the initial projections, with an additional \$5 million for the community development water and sewer project. In total, ARC projects leveraged \$948 million in direct private investment compared to original project commitments of \$387 million, and also generated an additional \$756 million of indirect private sector impacts. When including both direct and indirect impacts, private sector investment leveraged by this sample of ARC projects includes almost \$1.7 billion for economic development projects and \$7 million dollars for community development projects. Details of the private investment are shown in Table 3.6. The column, "Anticipated Private Commitments" shows the levels of private investment projected at the time of application, while the three columns that follow, "Actual Direct Investments, Actual Direct Private Investment [and] Indirect Private Investment, report private sector contributions leveraged by ARC funding.

The corresponding level of public funding for these 78 economic development projects was \$22.5 million of ARC funds and \$143 million of total public funds. Thus, there was \$11.86 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, the nature of various project types causes relatively large variations in the amount of permanent private investment. In some cases, such as roadways, housing and business incubator facilities, there is not substantial permanent private investment. On the other hand, there is substantial private investment associated with industrial parks and water and sewer projects targeted for economic development.

Second, the variation in the maturity and timeline of projects affects the amount of private investment. For example, private investment may not have had time to follow the development of publicly financed access roads.

Table 3.6 Private Investment Leveraged (In \$000's)						
Project Type	ARC Funding \$	Total Public Funding \$	***Anticipated Private Commitments	Actual Direct Private Investment	Indirect Private Investment	Total Private Investment
Access Road	\$599.1	\$1,882.6	\$0.0	\$0.0	\$0.0	\$0.0
Business Incubator	\$1,777.5	\$8,064.6	\$0.0	\$0.0	\$0.0	\$0.0
Housing Development	\$633.8	\$7,845.0	\$0.0	\$0.0	\$0.0	\$0.0
**Industrial Park	\$6,106.0	\$43,460.6	\$193,700.0	\$604,450.0	\$526,947.7	\$1,131,397.7
Industrial Site	\$3,329.8	\$17,040.4	\$54,400.0	\$87,741.2	\$111,073.0	\$198,814.3
Telecommunications	\$1,345.8	\$3,604.1	\$6,015.0	\$6,000.0	\$1,168.6	\$7,168.6
Water/Sewer	\$15,621.3	\$90,842.9	\$132,900.0	\$248,600.0	\$116,447.4	\$365,047.4
Total	\$29,413.3	\$172,740.3	\$387,015.0	\$946,791.2	\$755,636.6	\$1,702,427.9
Area Rating (pre-project)						
Multi-County with 1+ Distressed County	\$3,035.7	\$22,075.8	\$2,000.0	\$0.0	\$0.0	\$0.0
Multi-County with No Distressed County	\$647.0	\$1,410.9	\$3,500.0	\$120,000.0	\$30,978.3	\$150,978.3
**Single Competitive	\$1,073.3	\$14,098.4	\$126,800.0	\$537,800.0	\$437,638.8	\$975,438.8
Single Distressed	\$11,005.7	\$56,778.1	\$10,400.0	\$63,275.0	\$83,702.5	\$146,977.5
Single Transitional	\$13,651.8	\$78,377.1	\$244,315.0	\$225,716.2	\$203,317.0	\$429,033.3
Total	\$29,413.3	\$172,740.3	\$387,015.0	\$946,791.2	\$755,636.6	\$1,702,427.9
State						
**Alabama	\$1,805.1	\$10,810.4	\$151,400.0	\$618,500.0	\$480,603.2	\$1,099,103.2
Georgia	\$1,826.1	\$6,944.1	\$120,500.0	\$162,000.0	\$62,774.6	\$224,774.6
Kentucky	\$5,815.6	\$44,389.6	\$0.0	\$0.0	\$0.0	\$0.0
Maryland	\$1,765.0	\$5,379.2	\$2,500.0	\$2,500.0	\$3,311.5	\$5,811.5
Mississippi	\$1,857.5	\$13,163.3	\$3,200.0	\$3,200.0	\$6,744.9	\$9,944.9
North Carolina	\$1,584.3	\$8,782.5	\$9,500.0	\$10,100.0	\$10,698.0	\$20,798.0
New York	\$900.0	\$4,909.1	\$0.0	\$0.0	\$0.0	\$0.0
Ohio	\$2,300.0	\$13,328.0	\$7,600.0	\$8,741.2	\$5,623.8	\$14,365.0
Pennsylvania	\$1,650.1	\$16,448.9	\$53,515.0	\$67,275.0	\$95,506.9	\$162,781.9
South Carolina	\$1,500.0	\$13,246.2	\$0.0	\$0.0	\$0.0	\$0.0
Tennessee	\$3,563.5	\$16,368.2	\$36,800.0	\$71,400.0	\$86,435.9	\$157,835.9
Virginia	\$1,035.0	\$3,188.3	\$0.0	\$0.0	\$0.0	\$0.0
West Virginia	\$3,811.1	\$15,782.5	\$2,000.0	\$3,075.0	\$3,937.7	\$7,012.7
Total	\$29,413.3	\$172,740.3	\$387,015.0	\$946,791.2	\$755,636.6	\$1,702,427.9

* Table does not include \$90 million in retained private investment documented from interviews.

** Includes \$525 million direct and \$423 million indirect private investment from Huntsville (AL) Research Park .

*** Anticipated Private Investment refers to private investments anticipated at time of application

Second, the variation in the maturity and timeline of projects affects the amount of private investment. For example, private investment may not have had time to follow the development of publicly financed access roads.

3.6 Effects on Tax Revenues

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

Table 3.7 Additional Tax Revenues Generated				
Project Type	No. of Projects	State/Local Sales Tax Revenue	Local Property Tax Revenue	State Income Tax Revenue
Access Road	3	\$239,647	\$1,000,000	\$201,062
Business Incubator	5	\$333,687	\$0	\$397,381
Housing Development	4	\$0	\$11,563	\$0
Industrial Park	21	\$8,270,268	\$8,745,557	\$6,442,191
Industrial Site	12	\$842,393	\$445,738	\$563,349
Telecommunications	8	\$57,604	\$48,480	\$68,714
Water/Sewer	51	\$6,808,989	\$3,950,409	\$5,589,097
TOTAL	104	\$16,552,588	\$14,201,747	\$13,261,794
<u>Area Rating (pre-project)</u>				
Multi-County with 1+ Distressed County	8	\$667,497	\$45,601	\$1,015,636
Multi-County with No Distressed County	3	\$225,122	\$1,388,640	\$216,637
Single Competitive	5	\$5,529,272	\$8,461,726	\$4,888,389
Single Distressed	36	\$2,061,635	\$186,085	\$2,280,329
Single Transitional	52	\$8,069,062	\$4,119,695	\$4,860,803
TOTAL	104	\$16,552,588	\$14,201,747	\$13,261,794
<u>State</u>				
Alabama	9	\$4,852,491	\$10,582,575	\$3,540,270
Georgia	8	\$532,215	\$1,784,946	\$512,156
Kentucky	19	\$1,432,156	\$11,563	\$2,097,942
Maryland	6	\$80,826	\$21,623	\$247,293
Mississippi	9	\$2,032,287	\$123,557	\$868,944
North Carolina	9	\$469,583	\$81,098	\$600,631
New York	5	\$106,774	\$1,000,000	\$169,459
Ohio	7	\$250,295	\$12,075	\$329,188
Pennsylvania	10	\$1,804,594	\$4,022	\$2,338,665
South Carolina	2	\$1,452,902	\$0	\$1,246,877
Tennessee	11	\$2,404,467	\$528,250	\$48,049
Virginia	3	\$87,416	\$0	\$167,406
West Virginia	6	\$1,046,582	\$52,038	\$1,094,914
TOTAL	104	\$16,552,588	\$14,201,747	\$13,261,794

* Includes \$8.3 million tax revenue from the Huntsville (AL) Research Park .

- 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.

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

- State income tax revenue of \$13.3 million;
- State/local sales tax revenue of \$16.6 million; and
- Local property tax revenue of \$14.2 million.

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 differences in average sales and income tax rates among states. 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. Home areas of twenty projects in this evaluation also extended some form of tax abatements or tax incentives to private sector users. Most often, tax breaks are in the form of property tax abatements, given to projects locating in low-income and high unemployment areas targeted by states for economic development. The values of these tax breaks are not presented in Table 3.7, but are noted in the electronic Appendix H.

3.7 Benefit/Cost Analysis

Measurement Approach. The purpose of ARC project funding for infrastructure and public works projects is to invest 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 troubled (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 community development and housing development projects, the primary impacts are the provision of a basic quality of life through access to quality housing, and community water and sewer service with associated public health improvements. Local stakeholder 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:

1. 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. ARC is only one of several public investment sources used in a project financing package, however. 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.
2. 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.

Investment Impacts of Projects. The effectiveness of ARC in leveraging private investments, and generating jobs and personal income are summarized in Table 3.8. This table is presented in three parts. First it shows results for all projects. It then shows the results for the 78 economic development projects (Section 3.8-1), followed by the 22 community development projects (Section 3.8-2). Given the objectives of each set of projects, it is not surprising that economic development projects produce significantly greater results than those focused on basic services for communities. Water and sewer projects, and housing projects, however, are often funded with broader purposes than local economic development. These include basic health and quality of life objectives, which will be discussed in Chapters 4 and 5.

Table 3.8 Ratio of Total Results per Public Dollar for all Projects			
	Project Impact	Ratio per ARC\$	Ratio per Public\$
Total Private Investment (including indirect)	\$1,702,427,863 <i>**(\$754.2 Million)</i>	58 : 1 (26:1)	10 : 1 (4.4:1)
Jobs	Project Impact	ARC\$ per job	Public\$ per job
New Direct Jobs	17,795	\$1,653	\$9,707
New Total Jobs	43,136	\$682	\$4,005
Total New and Retained Jobs	52,716	\$558	\$3,277
Income	Project Impact	Ratio per ARC\$	Ratio per Public\$
Direct Income	\$638,775,134	22 : 1	3.7 : 1
Total New Income	\$1,331,839,875	45 : 1	7.7 : 1

Table 3.8-1 Economic Development Projects			
	Project Impact	Ratio per ARC\$	Ratio per Public\$
Total Private Investment (including indirect)	\$1,695,010,391 <i>**(\$746.7 Million)</i>	75 : 1 (33:1)	12 : 1 (5:1)
Jobs	Project Impact	ARC\$ per job	Public\$ per job
New Direct Jobs	17,645	\$1,274	\$8,102
New Total Jobs	42,911	\$524	\$3,331
Total New and Retained Jobs	54,491	\$412	\$2,623
Income	Project Impact	Ratio per ARC\$	Ratio per Public\$
Direct Income	\$634,443,857	28 : 1	4.4 : 1
Total New Income	\$1,326,171,298	59 : 1	9.3 : 1

Table 3.8-2 Community Development Projects			
	Project Impact	Ratio per ARC\$	Ratio per Public\$
Total Private Investment (including indirect)	\$7,417,472	1.2 : 1	0.3 : 1
Projects that Generated Economic Impacts		15:1	8:1
Averages for Two Projects that Generated Jobs			
Jobs	Project Impact	ARC\$ per job	Public\$ per job
New Direct Jobs *	150	\$3,203	\$6,441
New Total Jobs	225	\$2,135	\$4,294

* Excludes 75 hospital jobs added following replacement of the Jackson Water Storage Tank in Jackson, Kentucky due to ambiguous causality between the project and new jobs. This project is listed in the "community development" category and is located in a single distressed-county. Exclusion is consistent throughout tables.

**The \$754.2 million in Table 3.8 and the \$746.7 million in Table 3.8.1 reflect total Private Investment minus the disproportionately high investment for the Huntsville (AL) Research Park. Summaries of jobs and income include the large impacts from the Research Park.

Note: "Total" jobs and "total" income include indirect and induced spin-off effects.

Table 3.9-1 below separates the value of economic development investments and community development projects.

Table 3.8 presents results in three columns:

- The first column shows the project results in terms of private investment, jobs, and income.
- 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.
- The third column shows results comparing total impacts with total public dollars spent. Since the ARC funding is almost always accompanied by additional public funding for other aspects of the project, the total public dollars are always greater than the ARC dollars alone. (This is not true of the limited ARC planning and feasibility grants.)

The measure of total public dollars combines ARC funds, and other federal funds, state funds, and local public funds, treating 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.

These results demonstrate the following:

Private Investment Stimulated. Overall, \$58 of private investment was leveraged for every dollar of ARC investment; \$10 was leveraged for each public sector dollar regardless of source. For the 78 economic development projects, the ratio of private sector to ARC investments was \$75 to \$1, and the private sector invested \$12 for each dollar that came from either a federal, state or local public sector source. These public sector projects are designed to enhance regions’ attractiveness for business development and thereby attract private investment.

Community development projects, on the other hand, are designed to improve local quality of life for residents. For these projects, economic development is a secondary but often obtainable goal. For community development projects, \$1.18 of private investment has been documented for every ARC dollar invested. When all public sector investment is considered, \$.34 of private funds has been invested per public dollar as of these project reviews. However, if just the two community development projects that have generated jobs are examined, the ratio of private investment is \$15 for each ARC dollar, and \$8 of private investment was generated for each dollar of public funds.

Job Creation Rate. Overall, the economic development projects studied here cost \$3,331 per new job created, including indirect and induced job creation. If jobs saved are also counted the average cost drops to \$2,623 per job (new and retained). For ARC, each new job cost \$524 of Commission funds and \$412 when including retained jobs.

Personal Income. The new jobs for economic development projects led to increased personal income for residents of the affected counties. The ratio was approximately \$9.28 of *annual* personal income to \$1 of a *one-time* public funding investment for economic development projects. The ratio of annual personal income to ARC investment was about \$59 for every one-time dollar invested by the Commission.

Table 3.9 shows how the leveraging of public dollars differs by type of project and by project goal. This is shown in terms of ratios per ARC investment and ratios per total public investment for (1) all projects, (2) economic development projects and (3) community development projects, though investment per job is only relevant for Water and Sewer projects in this classification.

The analysis is useful as a presentation of alternative perspectives on viewing ARC investment impact by broad project objectives. Not unexpectedly, economic development projects show more robust private sector leveraging, and a significantly lower cost of jobs per ARC and overall public sector investment than found for community development projects. Among economic development projects, leveraging impacts are highest for Industrial Park projects, followed by Industrial Site, and Water and Sewer projects. For community development projects, measurable economic development impacts were found only for Water and Sewer projects, where private investment was attracted though the primary objective of these projects was “households served.”

Table 3.9 Results per Public Dollar by Project Type								
Project Type – All Projects	ARC \$	ARC % of Public\$	Public Dollars per New Job		Public Dollars per New + Retained Jobs		Private Dollars (including indirect) per Public Dollar	
			Using ARC\$	Using Public\$	Using ARC\$	Using Public\$	Using ARC\$	Using Public\$
			Access Road	\$599,100	32%	\$2,996	\$9,413	\$329
Business Incubator	\$1,777,500	22%	\$2,584	\$11,722	\$1,208	\$5,479	\$0	\$0
Housing Development	\$633,848	8%	\$0	\$0	\$0	\$0	\$0	\$0
*Industrial Park	\$6,106,020	14%	\$693	\$4,932	\$257	\$1,827	\$185	\$26
Industrial Site	\$3,329,843	20%	\$3,327	\$17,023	\$1,217	\$6,230	\$60	\$12
Telecommunications	\$1,345,759	37%	\$10,514	\$28,157	\$5,851	\$15,670	\$5	\$2
Water/Sewer	\$15,621,266	17%	\$2,243	\$13,041	\$689	\$4,006	\$23	\$4
Total	\$29,413,336	17%	\$1,653	\$9,707	\$558	\$3,277	\$58	\$10

* Includes 4,040 direct jobs from the from Huntsville (AL) Research Park.

Impacts of direct private investment are \$32 per dollar of ARC funding and \$5.5 per public dollar

Table 3.9-1 Breakdown of Results per Public Dollar by Project Type for Economic Development, Community Development and Housing Development Projects								
Table 3.9-1 Breakdown of Results per Public Dollar by Project Type for Economic Development, Community Development and Housing Development Projects	ARC \$	ARC% of Public\$	Public Dollars per Direct New Job		Public Dollars per All New + Retained Jobs		Private Dollars (including indirect) per Public Dollar	
			Using ARC\$	Using Public\$	Using ARC\$	Using Public\$	Using ARC\$	Using Public\$
			Economic Development Projects					
Business Incubator	\$1,777,500	22%	\$2,584	\$11,722	\$1,208	\$5,479	\$0	\$0
*Industrial Park	\$6,106,020	14%	\$693	\$4,932	\$257	\$1,827	\$185	\$26
Industrial Site	\$3,329,843	20%	\$3,327	\$17,023	\$1,217	\$6,230	\$60	\$12
Telecommunications	\$808,297	28%	\$6,315	\$22,553	\$3,514	\$12,551	\$9	\$2
Water/Sewer	\$9,854,795	14%	\$1,446	\$10,214	\$439	\$3,101	\$36	\$5
Access Road	\$599,100	32%	\$2,996	\$9,413	\$329	\$1,034	\$0.00	\$0.00
Total Economic Development Projects	\$22,475,556	16%	\$1,274	\$8,102	\$428	\$2,723	\$75	\$12
Community Development Projects								
Telecommunications	\$537,461	75%	N/A	N/A	N/A	N/A	\$0.00	\$0.00
Water/Sewer	\$5,766,471	27%	\$38,443	\$141,484	\$25,629	\$94,323	\$1.29	\$0.35
Total Community Development Projects	\$6,303,932	29%	\$42,026	\$146,266	\$28,017	\$97,511	\$1.18	\$0.34

* Includes 4,040 direct jobs from the from Huntsville (AL) Research Park.

Impacts of direct private investments generated by economic development projects are \$32 per dollar of ARC funding and \$5.5 per public dollar

Impacts of direct private investment attributed to community development projects are \$.79 per dollar of ARC funding and \$.29 per public dollar

Breakdown of Overall Results for All Projects. Table 3.10 shows the ratios of total results for all 104 projects by state and by the area rating of economic distress when the project was approved. The breakdown also reflects differences by project type. In looking at the state-by-state listing, it is important to keep in mind that (1) project objectives (economic, community or housing development), (2) project mix (industrial park, industrial site, access road, telecommunications, business incubator and housing), and (3) economic status of project areas (distressed, transitional and competitive) drive outcomes. Rates of income creation as well as private sector leverage tended to be higher for industrial parks, industrial sites and economic development portion of water/sewer projects than other projects, whether they are economic or community development initiatives. In addition, impacts are more dynamic in competitive counties than in transitional counties, and are stronger in transitional counties than in distressed counties. This latter finding reflects that the difficulty of job creation increases with the intractability of poverty.

Table 3.10 Results per Total Public Dollars by Place of Project				
Area Rating	Public\$ per Direct Jobs	Public\$ per Total + Retained Jobs	Total Income per Public \$	Private Investment per Public \$
Multi-County with 1+ Distressed County	\$30,407	\$14,997	\$1.89	\$0.00
Multi-County with No Distressed County	\$6,271	\$2,524	\$12.17	\$107.01
*Single Competitive	\$2,373	\$883	\$36.72	\$69.19
Single Distressed	\$23,109	\$8,274	\$2.96	\$2.59
Single Transitional	\$9,279	\$2,814	\$7.49	\$5.47
Total	\$9,707	\$3,277	\$7.71	\$9.86
State				
*AL	\$2,163	\$1,135	\$31.61	\$101.67
GA	\$11,200	\$5,095	\$5.26	\$32.37
KY	\$31,151	\$13,824	\$1.98	\$0.00
MD	\$18,874	\$2,445	\$2.67	\$1.08
MS	\$7,882	\$2,530	\$11.77	\$0.76
NC	\$10,896	\$2,357	\$4.49	\$2.37
NY	\$46,753	\$2,482	\$2.13	\$0.00
OH	\$38,409	\$17,197	\$1.32	\$1.08
PA	\$7,124	\$1,726	\$16.84	\$9.90
SC	\$7,769	\$2,293	\$8.35	\$0.00
TN	\$8,534	\$3,142	\$8.05	\$9.64
VA	\$9,963	\$5,613	\$3.18	\$0.00
WV	\$12,273	\$4,325	\$6.29	\$0.44
Total	\$9,707	\$3,277	\$7.71	\$9.86

* Includes 4,040 direct jobs from the from Huntsville (AL) Research Park .

Importance of ARC Support. The core question in any evaluation of economic development programs is to determine the extent to which outcomes can be related to the programs being examined. The discussion above relates outcomes in terms of ARC dollars and the portfolio of public investments by federal, state and local agencies in combination with ARC. We asked interviewees to rate the importance of ARC investments for making the projects in their counties possible, and to determine how much of the impact can be attributed to the Commission. Multiple interviews were conducted for many projects in this evaluation. Interviewees included project proponents; local public and private sector economic and community development leaders not directly connected with projects; and staff of sponsoring organizations who replaced initial project proponents and therefore do not have a personal or job related reason to defend past projects. Overall, interviews validated the following:

- ARC support made 73% of all projects possible, including 76% of economic development, 68% of community development projects, and all housing projects;

Table 3.11 Jobs Created as a Result of ARC Involvement

Project Type	Total New Jobs	Jobs Attributable to ARC Involvement	Percent Attributable to ARC
Access Road	636	636	100%
Business Incubator	1,357	1,001	74%
Industrial Park	22,815	22,299	98%
Industrial Site	2,583	1,992	77%
Telecommunications	230	101	44%
Water/Sewer	14,508	5,603	39%
Total	42,129	31,632	75%

Interviewees answered “don’t know” for projects including 1,007 jobs.
Totals include new direct, indirect and induced jobs

- 87% of interviewees for economic development projects said that the projects improved local quality of life; and
- 92% of community development and housing development respondents also said that these projects improved local quality of life.

From the “people on the ground” in communities where ARC projects were implemented, the implication of these findings are that 75% of project related new jobs would not have occurred without ARC intervention. As Table 3-11 shows (previous page), reliance on ARC appears strongest for jobs generated from industrial park and access roads, and weakest for telecommunications and water and sewer projects.

Though interviewees indicate 31,632 new jobs in Appalachia can be attributed to ARC projects, this is an undercount. Interviews indicate that six additional projects, accounting for an additional 7,288 jobs were facilitated due to ARC. Although interviewees said that these projects would have happened anyway, they noted that they would have been delayed for years; further, it is possible that the economic benefits now seen would still be incubating. Of projects not counted in Table 3-11:

- 3 water and sewer projects would have happened without ARC. Two would have been delayed (and therefore resulting economic development would have been delayed);

- 2 industrial parks were developed more quickly with ARC support than would otherwise have been possible. Interviews from one of these projects indicated that the delay would have been 5-10 years;
- Interviewees concerning a business incubator said that without ARC there would have been construction delays, resulting in lost contracts and slower economic development in the area; and
- Interviewees concerning an industrial site reported that development of the site would have been more difficult if ARC support were not available.

If the jobs generated from projects that faced long-term delays without ARC support are added to the totals in Table 3-11, then 92% of all new project related jobs are attributable to ARC according to local economic developers, including 100% of jobs generated by incubator and industrial site projects, 99% from industrial park projects and 80% from water and sewer development.

Notes

[i] These ARC projects have been successfully completed but the actual developments have not yet been implemented.

[ii] Of the 51 water and sewer projects in this evaluation, 32 are classified as “economic development and 19 are classified as “community development.”

[iii] For this report, multi-county projects with at least one distressed county are counted as “distressed.”

[iv] All multi-county projects with no distressed county were “transitional” at the time of application.

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, water/sewer service, telecommunications and housing. As noted earlier, the first three categories were considered to be classic economic development projects. Water-sewer and telecommunications projects were divided among economic development and residential development projects, although virtually all residential projects (aside from housing) also demonstrate some level of direct or indirect economic development impact. [i]

The discussion examines the outcomes for the 78 projects classified in the “economic development” category including all industrial park, business incubator, and access road projects, as well as 32 of 53 water and sewer projects, and five of the eight telecommunications projects. (Non-economic projects in these categories are treated separately, as are housing 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 a development project is commonly one piece of a larger package. Thus, it is difficult to unambiguously attribute the proper share of the impacts, and the tendency is often to “claim” credit for total impacts for each piece of the investment portfolio sponsored by various agencies.

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/Share” method elsewhere in the report.

On a more subjective level, the reality probably lies somewhere in. While the Full Credit method exaggerates the importance of any agencies credit share, the ARC Share approach likely understates it. With that in mind, the importance of stakeholder assessments of the criticality of ARC investments to projects (detailed in Section 3.7) should not be underestimated, including the finding that interviewees felt that ARC support made 73% of all projects possible.

This section also provides 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 provided context for the raw projection and impact of each project, and facilitated the identification of common themes among projects.

4.1 Water/Sewer Projects

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

Fifty-one water and sewer projects (49 percent of the total) accounted for 53 percent of the total ARC investment reflected in the sample. Thus, water and sewer projects tended on average to be slightly larger than the average sample project. Of the 53 projects in this classification, 32 had at least partial significant economic development objectives (i.e., were not purely residential in conception)

Table 4.1 Water & Sewer Projects: Aggregate Projections and Results			
	Projected	Actual	Difference to Date
New Businesses Served	226	322	96
Businesses Retained	89	91	2
Jobs Created	3,636	6,966	3,330
Jobs Retained	7,858	7,160	-698
Households Served	5,493	7,035	1,542
HH Served (non-planning projects)	5,237	7,035	1,798

As Table 4.1 indicates, water and sewer projects performed very well, meeting or exceeding aggregate projections in every case except for a shortfall in retained jobs. Projections for new businesses, jobs, and households served were exceeded by substantial margins. 42% more new businesses were served than originally projected, and 92% more new jobs were created. 28% more households were served than anticipated.

Because of the integrated economic development and residential nature of many water-sewer projects, it is difficult to accurately pull out measures such as cost per job used to assess other classifications; If the per job cost is higher, but a

substantial number of residences are served, is there an offset? This is a policy issue beyond the scope of this project.

In the project sample pool, 19 of the water-sewer projects were assessed to be strictly residential, while the other 32 were in part or whole economic development oriented. Table 4.2 breaks out results of these two types of project foci, barring overlapping results and yielding a better picture of how the primary objectives were satisfied. Since many of the projects overlapped residential and economic objectives and results, these are imperfect, subjective classifications. However, by analyzing the investment results of the water and sewer projects in three parts -- overall, and within the residential and economic development sub-categories, we hope to provide a more realistic perspective on ARC return on investment.

Table 4.2 Water & Sewer Projects: Residential and ED-based Projects and Results			
	Projected	Actual	Difference to Date
Residential (19)			
Households Served	5,041	4,574	-467 *
HH Served (non-planning projects)	4,785	4,574	-211 **
Economic Development (32)			
New Businesses Served	217	313	96
Businesses Retained	81	83	2
Jobs Created	3,276	6,816	3,540
Jobs Retained	7,858	7,160	-698

Note: Projections and Results do not sum to table 4.1 due to sub-category screening

* The shortfall is largely due to a single project which has not performed as projected to date

** One planning-only project projected 256 new jobs

After segregating the water-sewer projects by residential and economic development-focus, the major differences in outcomes are two-fold:

- Actual new jobs created now are now 208% of the number of new jobs projected
- The outcome of households served is reversed. Projections now exceed actual households served, indicating that economic development projects with ancillary residential outcomes are more effective (or may simply tend to downplay outcome expectations of what are considered secondary project impacts).

As shown in Table 4.3, aggregate results for the economic development project sub-group of water-sewer projects show that ARC investment per job was \$1,446, and \$10,214 by the ARC share calculation method. Investment for newly created and retained jobs was about half in each category. Costs per job remained relatively low but increased significantly when the costs and results of all 51 projects were included for the water-sewer group as a whole.

Since economic development-focused water-sewer projects performed so well in ancillary services provided to residents, the cost per household under the full credit calculation method was actually lower when all projects (not just residentially-based projects). However, when the ARC share calculation was used, residential-only project were more cost effective serving households with water and sewer (\$4,640 per household) than was the total water-sewer project group (\$7,658). The difference is due to the smaller percentage of ARC investment in the economic development projects, and hence the smaller “claim” on results.

Table 4.3 Water & Sewer Projects: Residential and ED-based Projects and Results		
	Calculation Method	
Residential (19 projects)	Full Credit (\$)	ARC Share (\$)
Cost per Household Served	1,557	4,640
Economic Development (32 projects)		
New Businesses Served	31,485	207,432
All Businesses Served	24,886	164,192
Jobs Created	1,446	10,214
All Jobs Created or Retained	689	4,006
All Projects (51)		
Cost per Household Served	1,387	7,658
New Businesses Served	48,513	267,834
All Businesses Served	37,824	208,820
Jobs Created	2,243	13,041
All Jobs Created or Retained	1,106	6,105

Of the 51 water-sewer projects, forty met or exceeded economic and residential projections, 27 of 32 economic development projects in the classification (84%) satisfied projections, while 68% of the residential projects fared as well. (28% of the economic development projects exceeded projections, compared to 21% of the residential projects.) Among the economic development projects that experienced shortfalls, two (Watkins Glen Second Street-NY and Andrews Wastewater Treatment Plant-NC) were recently completed only in 2005. The

third (County Line Industrial Park-AL) was completed in 2002; its outcomes shortfall is apparently due to properties sold as a result of the project improvements but which have yet to be built upon. Residential projects experiencing shortfalls have more varied end-date time frames. One had not made outcome projections. There was no discernible geographic pattern to projects which did not, as of yet, satisfy their outcome projections.

Local projects in several states tended to group around an economic development or residential focus. All six projects in Alabama, all seven in North Carolina and all three in New York were economic development-oriented. Both water-sewer projects in Oh and both in VA were residential. Other states like Kentucky (four ED and seven residential) split the focus of their projects.

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 trends and situations in which water and sewer projects generated other qualitative outcomes not readily measured by the usual performance measurements.

It is worth remembering the very basic needs (taken for granted almost everywhere else) that traditional residential water-sewer projects address in Appalachian areas:

- At least three projects were designed in part to bring potable water and fire protection to schools (Reform Water System Improvements-AL; Breathitt County Water Line-KY; Carrs Fork/ Littcarr Water Extension-KY).
- Four other projects were addressed to basic needs of fresh water for communities which did not have water clean enough to drink or do laundry (Lick Creek/Mingo County Water-WV; Slate Creek Water-VA; Stoney Fork/Red Bird/Saylor Hollow Water-KY; Whitley County Water-KY)
- Other residential projects analyzed their experiences as a positive step toward broader community revitalization:
- The Salt Lick Sewer Collection project (KY) was understood by stakeholders as a step toward business development over and above the almost 500 residences served. Credit for development of a new school and private investment in a new bank were directly attributed to the project, which was also seen as a vehicle that improved regional cooperation.
- Another project (Whitley County Water-KY) experienced lower than anticipated bids, and used the in-place funding to extend the scope of the project, increasing the number of households served by 15% with the original funding.

Interviews with stakeholders from the economic development-based projects in the water-sewer classification indicated a number of interesting commonalities:

At least seven of the economic development sewer-water project were primarily concerned with servicing a single larger bird-in-hand business, and did for a total of over 3,300 new and retained jobs. Six of the seven met or exceeded job projections, suggesting again that the bird-in-hand project type is a significant success indicator (Taylorsville Industrial Water-NC; Icard Water Improvement-NC; Big Flats Sewer Improvement-NY; Dushore Borough/ Cherry Township Water Extension-PA; Valley Head Sewer System-AL; Upper Potomoc River Commission Sewage Treatment-MD). The seventh (Andrews Wastewater Treatment-NC) fell short of projections due to the closure of a large apparel manufacturer. However, the project managed to serve other businesses and impact over 600 new and retained jobs in other firms, making the ARC share of cost per job for that project just a little over \$5,000.

Three projects significantly exceeded new jobs projections by helping to attract unanticipated business through infrastructure improvements. Together these projects had projected 410 new jobs created, while reported results included 1,825 new jobs created. These included the Brasleton Water Expansion-GA (a new chicken processing plant and tripled population since 2000); the Brushfork Sewer Project-WV (attracting a 300-job telecommunications firm); and the Northeast MS Regional Water Supply Facilities Improvement-MS, which attracted businesses employing up to 300 workers to the North Lee Industrial Park.

Two KY areas reported very positive results from prison-related projects (Paintsville/Honey Branch Wastewater; McCreary County Prison Infrastructure) including the creation of 800 jobs and the retention of another 250. Both areas reported related spin-off business development, including restaurants, fuel and convenience stores, hotel development and an increase in airport activity near Paintsville.

Significant, broader development spin-offs resulting from projects originally focused on service to industrial businesses were also related by stakeholders in at least four additional project areas, including Pickens County 18 Mile Creek Sewer-SC; Dawsonville Water System Improvements-GA; Elkin Sewer Extension-NC; and Gaffney/Clary Wastewater Treatment Plant-SC.

- The Gaffney project was industrially focused but realized broad retail and educational impacts, including an expansion of the local community college.
- The Pickens County project far exceeded its job creation goals, including 850 new high quality jobs as well as unforeseen restaurant and hotel development.

- The Dawsonville project spurred development of a new high school, restaurants and helped the tourism community.
- On a reduced budget, the Elkin project served the businesses and created the jobs it set out to assist, and also set the stage for new community college development.

In addition:

- The need for future telecommunications projects was expressed (unsolicited) by interviewees from four of the 32 economic-development-based projects.
- Representatives from nine projects were unable to confirm budgeted dollars (six from ED projects and three residential), while another three ED project representatives were unable to confirm whether or not the projects had resulted in private investment. One project did not establish original outcome projections.
- In many cases, local project sponsors sold their results short by not closely tracking ancillary development, including residential and retail development resulting from projects which were primarily industrial in conception, or economic development results from projects which had a primary residential or community focus. In general, lack of resources were held responsible for this lack by interviewees; incentives built into the program may have resulted in better impact tracking and reporting.

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-one industrial park projects (20 percent of the total evaluated project pool) accounted for 21 percent of the total ARC investment reflected in the sample. Thus, industrial park project grants were very slightly larger (by about \$8,000) than the average sample project.

As Table 4.4 indicates, industrial park projects performed quite modestly in aggregate, at least to date. It is, however, important to remember that industrial parks tend to be speculative, and that development and marketing take considerable time. In this sample, only four projects have had five or more years to germinate. Eleven were not completed before 2003 and seven had only two years to develop. The retained job projections are on the mark, and indirect jobs

produced are far above projections, even at this relatively early date. These results fall notably short of the industrial park projects reviewed in the 2000 evaluation, but, as a group, they are much less mature as well. The vast majority of earlier park projects were more than five years old at the time of the original evaluation.

Despite unmet projections and the development time frame, however, the return to date on industrial park projects is impressive. Using the absolute method, one new job has been created for each \$693 invested by ARC. Even more important, using the “ARC Share” method, only \$4,932 was invested for each job created.

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 examples where industrial park projects generated other qualitative outcomes not readily measured by the traditional performance measurements, including:

- Providing higher quality jobs and income than were usual in project areas (Browder Switch Industrial Park-TN; Macedonia [now Roane] Industrial Park-TN; Washington County Industrial Park-TN).
- Doubling as incubator efforts or where projects helped pinpoint the need for startup financing (Upper Kanawha Valley-WV; Victory Road Business Park-PA; Cambria Iron Works Complex-PA).

Table 4.4 Industrial Park Projects (21): Aggregate Projections and Results			
	Projected	Actual	Difference to Date
Businesses Served	80	57	-23
Businesses Retained	0	1	1
Jobs Created	14,125	8,812	-5,313
Jobs Retained	1,068	968	-100
Indirect Jobs	n/a	14,003	n/a
Households Served	3,000	3,000	0

- Making substantial improvements to residential areas as well as the direct economic development project objectives (Tompkinsville Industrial Park-KY; Morehead Industrial Park-KY).
- Stimulating and feeding from cluster development; (National Printing Innovation Center and Upper Kanawha Valley Industrial Park-WV; the Fuel Cell Technology Center and Logan-Hocking Industrial Park-OH).

- Focusing on brownfield reuse and development. (Cambria Iron Works Complex-PA).
- Confirming that a bird in hand was the single most consistent indicator of project success to date. It was clear from the interviews that the best results from larger park development projects are achieved by beginning with a bird-in-hand (Greenville Hardin-TN; Huntsville Research Park-AL; Coaldale Business Site-PA; Monroe Industrial Park-PA; Washington County Industrial Park-TN). Projects that began with a bird-in-hand tended to succeed while others tended not to (although this was certainly not always the case). Once bird-in-hand development begins, speculative development becomes realistic and possible (Macedonia [now Roane] Industrial Park-TN).

In addition a significant number of interviewees:

- Pointed out demand for broadband access development as critical to further business investment in their areas (Morehead Industrial Park-KY; Logan-Hocking Industrial Park-OH; Monroe Industrial Park-OH; Macedonia [now Roane] Industrial Park-TN; Morehead Industrial Park-KY). This envisioned future project focus was at least as pervasive as expressions of interest regarding more traditional infrastructure needs.
- Demonstrated spotty record keeping, poor access to project files or incomplete projections and results. This often resulted from staff turnover issues, and was apparent in at least five of the 21 projects in this classification.

4.3 Industrial Sites

The twelve industrial site projects in the sample received \$3,329,843 in ARC investment, for an average project cost of just over \$277,000, very close to the average sample project cost of \$282,280. Four of the projects closed in 2001 or earlier; three closed in 2002, one in 2003 and four as late as 2004. Later projects, in particular, are likely to report results that are lower than eventual impacts.

While the industrial site projects out-performed projections for businesses served, businesses retained and jobs retained, the number of jobs created was, at the time of the evaluation, less than 50% of the aggregate projection. However, 1,000 jobs of the shortfall from projections emanates from the Fayette County PA planning project, which began with first stage environmental plans for three sites as the start of a broad, long term site development strategy. Although only one firm has been located on the sites to date, that investment has included

a private sector commitment of \$51 million. It is still anticipated that the more robust job projections will come to fruition.

Table 4.5 Industrial Site Projects (12): Aggregate Projections and Results			
	Projected	Actual	Difference to Date
Businesses Served	13	16	3
Businesses Retained	7	8	1
Jobs Created	2,265	1,001	-1,264 *
without planning projects	1,265	1,001	-264
Jobs Retained	130	152	22
Indirect Jobs	n/a	1,582	n/a
Households Served	292	200	-92

* Includes one pure planning project that projected 1,000 new jobs

Having said that, it is still somewhat disappointing to note that half of the industrial site projects report results for jobs created that fall below projections. Site projects with shortfalls are spread among large and smaller projects, and cover the range of time periods since the projects were closed.

As result, ARC investment figures do not demonstrate the same level of return in this classification as some others. Using the full credit method, \$3,327 in ARC funds was required for each job. However, using the proportional methodology, each job required an ARC investment of \$17,023. Naturally, these figures will be reduced dramatically if the projects develop over time, especially the Fayette County (PA) site plans.

Nevertheless these projects created jobs (both new and retained) at a very efficient clip. One note: The relatively large average size of firms created by these projects (135 employees) suggests a focus on large firms that likely did not emanate from the project area. Smaller investments in locally controlled firms might also be in order, considering the findings on mature firm growth and entrepreneurial activity levels in Section 6.

- Of the twelve projects, six completely met or exceeded goals (Cumberland Rolling Mill Infrastructure-MD; Johnson City Utility Line-TN; Endless Mountains Industrial Building-PA; Hocking County infrastructure-OH; Fort Payne Distribution Center-AL; Grundy County Industrial Building-TN). Three substantially attained projected goals (Monroe County Industrial Building-MS; Jenkins Industrial Site-KY; Rock Springs Industrial Park-GA); and two (in addition to the Fayette PA planning project) have not yet approached their projected job creation or businesses served goals (Central Garrett Industrial Park-MD; Hardy County Industrial Building-WV).

- Interviewees for two projects could not confirm whether or not there had been private investment as part of, or resulting from, the project.
- Five of the twelve projects had made no initial projections for “businesses served”. Two of the partially attained projects failed to make prior projections for the number of businesses to be created or served.

Because of the similarity in focus (and resulting ambiguities in classification selections) it also makes sense to look at the outcomes of industrial site and industrial park projects as one:

Table 4.6 Aggregated Industrial Park & Site Projects (33): Projections and Results		
Per:	Calculation Method	
	Full Credit	ARC Share
Jobs Created	\$962	\$6,159
Jobs Created and Retained	\$863	\$5,529

As discussed earlier, a variety of reasons resulted in jobs shortfalls, including a planning-only project, the timing of this evaluation relative to development timeframes and, we suspect, some overly optimistic application projections.

Despite those shortfalls, the combined industrial park and site investment per job created was just over \$6,000, for jobs which several interviewees enthusiastically described as very high quality relative to others in their project areas.

4.4 Business Incubator Projects

ARC investments in business incubators primarily include the development of buildings suitable for multi-enterprise business start-up purposes. [ii] Five business incubator projects (five percent of the total) accounted for six percent of the total ARC investment reflected in the database. Thus, business incubator project grants tended to be about \$73,000 (26%) larger than the average sample project. Larger projects create additional demands on return data, a factor that intensifies among incubator-based firms, which tend toward conservative startup employment.

As Table 4.7 indicates, incubator projects met or exceeded aggregate projections in every case. Actual newly created jobs created exceeded projections by 71%.

Table 4.7 Incubator Projects (5): Aggregate Projections and Results			
	Projected	Actual	Difference to Date
Businesses Served	52	55	3
Jobs Created	403	688	285
Indirect Jobs	n/a	669	n/a

What is impressive about the results to-date of incubator projects is that four of the five were completed only in 2004-2005. In other words, the actual results reported have been developed in 1-2 years, much more accelerated than might be anticipated. The apparent demand and rapid success of this entrepreneurship service underscores findings about gaps in startup activity that (as discussed in Section 6) are consistent in both the 2000 review as well as the current one. With a high level of assurance we point to this remark from the earlier study:

The entrepreneurial vitality analysis 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.

ARC incubator job (and business) investments also appear to be efficient, especially given the slow ramp up nature of the program and the short development time frame since project completion. Using the "full credit" method, there was one job created for every \$2,584 invested by ARC. By the same method, \$32,318 was invested for each new business served. By the proportional method, new incubator jobs required an investment of \$11,722, and each newly created business a heftier \$146,629.

Table 4.8 presents a mixed picture of startup activity in the incubator project areas. It needs to be emphasized that incubators rarely demonstrate measurable area results in the short term, and that these incubators, in particular, have had precious little time to develop. [ii]

What is most notable about these startup activity rates (two in distressed counties and two at-risk) is that in every case there was a clearly identified (if intuited) need for the project; activity indices had dipped and a focus on entrepreneurial activity was in order. In four of the cases, the clearly positive

impact of the incubator (as shown in jobs created and businesses served results) have not had sufficient time to spread through the projects area, or in some cases, show up in the measurements. In the single longer-term project, in VA, the startup activity index has moved significantly back up toward US levels since project completion in 2001. As a matter of correspondence, (not necessarily causality) it's worth noting that the same three-county project area has moved from a designation of multi-county with 1+ distressed county to no distressed counties.

Table 4.8 Incubator Project Areas: Trailing Startup Activity (US=1.00)					
	Startup Index Rates				Project Completion
	1998-2000	2000-2002	2002-2004	2005	
Colbert, AL	0.95	0.73	0.73	0.72	2005
Kemper, MS	0.91	0.55	0.23	0.00	2004
Athens, OH	0.68	0.65	0.71	0.60	2004
Fayette, PA	0.64	0.55	0.52	0.52	2005
Lee-Scott-Wise VA	0.86	0.58	0.71	0.72	2001

* Two decimal indices show relation to US startup activity rates, where US=1.00 and 0.90, for example, reflects 10% below the US rate.

In addition to these quantitative outcomes, the interviews conducted with economic development officials and various community leaders in each community served by the projects identified some important issues among even this small number of projects:

- Four of the five incubator projects reported results well over projections (new businesses served, jobs created or both), including two projects completed in 2004 and one in 2005. This finding, perhaps more than any other, expresses the region's thirst for startup assistance as a tool geared toward increased entrepreneurial vitality.
- Projects which already reported fulfillment of goals included two distressed counties (Athens, OH and Kemper, MS) and two more classified as at-risk (Fayette, PA and Colbert, AL).
- One of the projects (in an at-risk county, the Shoals Entrepreneurial Center in Colbert AL) involved a second expansion of an existing incubator. Another, the Kemper County Incubator, also involved an expansion of an existing incubator.
- Interviews for two of the five projects indicated deficiencies in record-keeping, reporting and/or development of original projections.

- One project reported a distinctly higher job quality from the incubator project than normally seen in the area (OH University Innovation Center in Athens, OH).

4.5 Access Road Projects

The sample included only three Access Road projects, largely due to the additional housing and telecommunications categories in this evaluation round. Access road projects funded both access to specific industrial user sites and access to multi-user industrial parks. In each of the three cases, the project was designed to serve multiple businesses. The three projects (three percent of the total) accounted for two percent of the total ARC investment reflected in the sample. Thus, industrial access road project investments were on average \$83,000 (29%) smaller than the average sample project.

As Table 4.9 suggests, industrial access road projects performed well in the business served categories, as well as new jobs created. Actual retained jobs fell far below projections, but this appears to be due mainly to an industry cyclical downturn, rather than any specific local conditions. (The firm in question remained in the area but cut its work force substantially.)

Table 4.9 Access Road Projects (3): Aggregate Projections and Results				
	Projected		Actual	Difference to Date
Businesses Served	1		2	1
Businesses Retained	10		14	4
Jobs Created	198		200	2
Jobs Retained	1,651		1,185	-466
Indirect Jobs	n/a		436	n/a

ARC investments in access road projects paid off with significant leveraging rates. Since the nature of access road projects is often to improve conditions for existing businesses, it is worth looking at both new and retained jobs in light of investment.

By the full credit method, one job was created for each \$2,996 of ARC investment; the investment was \$9,413 figured by the proportional method. Similarly, each job required an investment of \$329 (or \$1,034 by the proportional method) when including both new and retained jobs.

Interviews probing the three access road project revealed some correspondence with other industrially-related classifications:

- Bird-in-hand projects were most successful (Prescott Avenue Industrial Access Road in Chemung, NY), Improvements to existing occupied sites with additional space spurred new and unanticipated business location (Louisville Winston County Access Road-MS).
- One project designed mainly for a bird-in-hand customer fell short in its original objective due to an industry downturn, but service to a second industry (wineries) spurred an unanticipated boost in area tourism and likely, economic diversification efforts (Hammondsport Industrial Access Road-NY).
- One project area was unable to confirm project funding from existing records.

4.6 Telecommunications

Before beginning the review of telecommunications projects, it is worth mentioning that an unusual number of stakeholders representing industrial park, industrial site, incubator and other economic development projects spontaneously expressed the desire for telecommunications enhancements, or telecommunications project investments, in their areas. Those thoughts seem particularly important in the context of the clear lines that can be drawn between some of the telecommunications projects discussed here and enhanced area business operations. We suggest some future tie-in between traditional and Telecommunications projects in the conclusions to this report (Section 7).

Telecommunications, a new project category, was represented by 8 projects in the sample. Of these, five were judged to have had primary or critical economic development impact projections.

As a group, the telecommunications projects accounted for an ARC investment of \$1,345,579, or 5% of the total sample pool investment. The eight projects themselves were 8% of the pool. The average telecommunications project investment was \$168,220 or 41% smaller than the average sample pool project investment.

Unfortunately, the economic development-based project with the largest ARC investment had to be excluded from the results calculations because no projections had been developed prior to implementation, and, no results had been collected. One of the two non-economic development-based projects were also excluded for projection purposes, since no household impacts were either projected or reported.

As Table 4.10 reflects, the ED-based telecommunications projects exceeded projections for both the numbers of business served and jobs created. The 96 jobs created shown in the table is understated, because one project sponsor (which accounts for 15% of the businesses served) did not track job creation or retention. Note the relatively large number of households also served (600), in this case by a single project. (The other ED-based projects did not track households served, although they were, in fact, served in some cases.)

Table 4.10 ED-Based Telecommunications Projects (5): Projections and Results					
	Projected		Actual		Difference to Date
Businesses Served	53		163		110
Jobs Created	81		96*		15
Households Served	600		600		0
Non-ED project (1)					
Households Served	1000		1000		0

* sums four projects; one did not collect jobs data; non-ED projects created another 32 jobs (total 128).

Of the eight telecommunications projects, three have already met their goal levels for businesses served, job created or retained and households served. Three have exceeded their goals. One, completed in 2005, has satisfied residential but not business objectives; and one never established any real goals.

The ED-based projects received \$500,977 in ARC investments (37% of the total telecommunications investment). This works out to a “full ARC credit” cost of \$3,073 per job created, and a proportional share investment of \$15,338. (The per-job investment rises to \$8,420 if the excluded project is folded into the investment total.) This also works out to a cost of \$383 per household by the full credit method, and \$3,165 by the proportional method, using data from only the two projects that had household projections and results.

When the data for households served (connected) includes both ED-based and the non-ED project with results data, the total of 1600 households served works out to \$393/household using the full credit method and \$1513 when the proportional calculation is applied.

Interviews with project stakeholders also indicated that:

- The projects themselves focused on a variety of extremely creative efforts, including re-use of an older industrial building for telecenter operations (Blue Ridge Telecenter Development-NC); tele-radiology development that allows

rural x-rays to be transmitted anywhere in the world (Hancock County Picture Archiving-TN); distance learning access (Western MD Regional Video Switched Network-MD) and two projects targeted toward startup enterprise services (Epworth Broadband Initiative-GA; Garrett Information Center-MD).

- Four projects met or exceeded goals on an extremely short timeline (projects closed in 2004 or 2005), including Hancock County Picture Archiving-TN; Blue Ridge Telecenter-NC; NC Mutual Endeavor-NC; CANA-PA; Another closed in 2005 and has already largely met both residential and businesses objectives and as well (Epworth Broadband Initiative-GA).
- Follow-up investigation of private funding and development impacts of the projects were not rigorously undertaken in at least two areas (in addition to the third which had not established goals).

4.7 Housing

The second of the two new categories in this evaluation was housing projects. These projects focused directly (solely) on residential housing development, as opposed to other project classifications which sometimes included ancillary housing impacts or benefits to residential households.

The four housing projects included in the sample (and all housing projects in the closed pool from which they were selected) were located in the state of Kentucky. In all, the projects were designed to create 210 new residences and to-date fell just short of the goal, reporting 200. All were closed in time for final construction impacts to be reasonably reported. One of the projects invested in a transitional housing shelter which also served as a broader-based community center.

As a matter of investment, the housing projects required \$3,669 of ARC investment by the full credit calculation method, but \$39,725 by the proportional credit method. The latter figure will no doubt be the source of some discussion as to the value of the investment. As part of that discussion, it would be worth examining in depth the Safe Harbor Transitional Housing and community center project in Wheelwright, KY. This project created 20 residential units (of a smaller, transitional nature than any others) while assisting the development of a community center and centralized services that received what can only be described as rave reviews by stakeholders. The relative cost of that investment was \$1,120 per unit by the full credit methodology, and \$3,745 by the proportional method. This was a small project, and certainly not easily replicated elsewhere, but the lessons of multi-function investment with a strong housing component should not be lost.

There are two ways to look at this data. The first option looks primarily at the numbers. Given this, there is a very wide range of per unit investment costs -- from \$3,745 to \$85,391. Despite the variance, these are (for the most part) known costs with known results, unlike many economic development investments. (The project with the highest per unit ARC investment, Irvine Downtown, benefited from a significant increase in ARC funding from the original application request.) The wide fluctuations in costs suggest the need for tighter policies regarding desirable per unit costs. The positive outcomes for the multi-unit housing also suggest the need for some policy guidance regarding the desirability, and fiscal trade-offs, of various types of housing investments.

Table 4.11 shows the detail of all four housing projects in the sample, reflective of this first ARC effort.

Table 4.11 Housing Projects (4): Return on Investment					
	Housing Units		Investment per Unit		
	Projected	Actual	Full Credit	Proportional Credit	
Clifty Heights Elderly Rental Housing	10	10	4,000	48,917	
Safe Harbor Transitional Housing (in community center)	20	20	1,120	3,745	
Fed. of Appalachian Housing Enterprises (low income housing)	150	140	3,082	33,709	
Irvine Downtown Project (elderly housing)	30	30	4,667	85,391	
Total	200	200	3,169	39,225	

The other perspective is more one of economic development. In the same way that roads and sewer lines developed for industrial purposes can also spur housing development as an ancillary impact, it's also clear from this set of projects that housing development can also generate or contribute to other developments and services worth considering. For example, the Safe Harbor Transitional Housing project clearly served as an anchor for centralization of services and expanded use of the Wheelwright community center. By the accounts of interviewees, it also enhanced conditions for downtown development and had a direct impact on the retail situation downtown (through the housing and expansion of community center services that attracted more people into town). The Irvine Downtown Elderly Housing project was given direct credit by stakeholders for sparking downtown revitalization. (Perhaps coincidentally, both of these projects involved multi-unit housing types.) If these important indirect impacts are to be considered in the funding process, they should be recognized and, if possible tasked with quantifiable goals.

Only four housing projects were included in the sample, but based on stakeholder interviews and reported data, the results, including broader impacts, were impressive:

- Three of the four projects satisfied projected outcomes. The fourth (Federation of Appalachian Housing Enterprises-KY) fulfilled 93% of its objectives, but also cut originally funded costs by 42%.
- Two projects involved traditional new construction housing and did well. Two others, however, took more creative approaches. Safe Harbor Transitional Housing project in KY, renovated a portion of a community facility to meet local needs for transitional housing. The Irvine Downtown Project-KY applied funds to acquire and rehabilitate three downtown buildings as low income senior housing which sparked private downtown investment (not originally projected).
- At least two of the projects resulted in significant and largely unanticipated community or economic development activity. The Clifty Heights Elderly Rental project (KY) sparked the development of a Boy's Club, Girl's Club and a Domestic Abuse Violence Center, as well as a second effort in a nearby area modeled on the project. The Irvine Downtown project triggered other downtown revitalization and an estimated additional \$600,000 in local spending reported by local businesses, as well as the rehabilitation of a downtown grocery store, movie theatre and dry cleaner.

4.8 Efficiency Summary

Before leaving this section on project results, it's worth taking a look at the relative return on investment of various project classifications, keeping in mind that projects reviewed are a sample at a given point in time.

Table 4.12 Return on New Job Investment by Project Type			
Project Type	Calculation Method		
	Full Credit (\$) New Jobs		ARC Share (\$) New Jobs
Access Road	2,996		9,413
Incubator	2,584		11,722
Industrial Park	693		4,932
Telecommunications	*6,315		*22,553
Industrial Site	3,327		17,023
Water/Sewer	1,446		10,214

* Cost per job elevated by one non-reporting ED project.

All project types are within reasonable and accepted cost parameters for new jobs when using the ARC share calculation method, and certainly even more so by the full credit method. In general there is a clear efficiency to utilizing projects that serve multiple firms, as most except industrial site project are likely to do. Additionally, however, it's worth noting the job creation costs of incubators, whose primary service purpose is to nurture enterprises early in their formation, often with the understanding that meaningful job creation would come down the road. For that reason, and because of the stark problems of entrepreneurship faced by large segment of the Region, the solid new job investment of incubators is specifically noted.

Notes

[i] 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.

[ii] For a detailed explanation of the startup activity index, please see Chapter 6.3. For immediate purposes, however, it is probably enough to know that the index compares national and local entrepreneurial activity rates, using a US benchmark of 1.00. Index scores below 1.00 are below the national average by the corresponding percentage.

5. Localized Strategic Project Impacts

Although reporting mandates create the need for statistical impact analysis which occupies much of this report, it would be a mistake to lose sight of the strategic purposes of development investments. While statistical impacts are one measure of success, broader, often more subjective results describe progress on strategic objectives at least as dramatically.

This section looks at various projects that fulfilled specific development objectives in the Region and among various local project areas, and identifies common approaches among project toward those needs. The identified objectives (both implicit and explicit) that are examined include:

- Economic diversification efforts targeted previously under-represented sectors in the local economy, with the aim of strengthening the economic base of the community.
- Reuse of vacant or underutilized sites, including abandoned industrial and commercial sites in areas ranging from traditional manufacturing centers to urban downtowns;
- Support for traditional industries that continue to be the mainstay of many project counties;
- Speculative development efforts;
- Projects that contributed to area work force development efforts
- Projects with significant non-economic community service Impacts
- The effects of projects in distressed counties and attempts to identify cases in which projects may have contributed to tangible progress in distressed counties.

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 risky dependence on any one sector. To assess progress in project areas, a diversification analysis was performed for each project location. Results of this analysis on a project-by-project area basis are discussed in Section 6.1 of this report and detailed for each area in the appendices.

So that the diverse measures included in the economic analysis can be easily digested, they are presented for each project impact area in an indexed format

that compares the project area to the corresponding US average. In each case, the US average equals 1.00, and the relative measure for the project area is above or below 1.00 in the same proportion. For example, a project area index of 1.10 indicates that the project area is 10% above the US average; if 0.90, it is 10% below. This methodology is discussed in greater detail in the introduction to Section 6: Economic Conditions in Project Areas.

Table 5.1 Aggregated Project Area Economic Concentrations						
	Business Count		Employment		Reported Sales	
	1998	2004	1998	2004	1998	2004
Agriculture	0.81	0.94	0.82	0.80	1.02	1.07
Mining	1.77	1.57	2.24	1.87	1.15	0.72
Construction	1.01	1.08	0.97	0.94	1.43	1.21
Manufacturing	0.98	1.00	1.34	1.26	0.75	0.73
Transport-Commun.	1.05	1.05	0.88	0.95	0.81	0.58
Wholesale	0.85	0.88	0.83	0.83	0.81	** 1.90
Retail	1.18	1.15	1.07	1.10	1.51	1.21
Finance-Ins-Real Estate	0.86	0.88	0.74	0.74	0.93	0.80
Services	0.96	0.96	0.90	0.95	1.24	1.15

** The large sales index increase is due to a single firm; backing out that data, the 2004 Sales Index remains at about 0.80.

The aggregate analysis emphasizes the heavy reliance of project areas on the mining section, but also shows that significant movement was made toward US concentration levels between 1998 and the beginning of 2005. By the same token, the indices indicate concerns in at least three important sectors:

- The number of business operations in the manufacturing sector is on par with US concentrations. The aggregated project results exhibit a continued high level of employment dependency on the sector, one that has dropped since 1998 and appears to be moving toward US levels. The real concern here is that the sales of region-based manufacturers are still far below US levels, suggesting a heavy employment reliance on branch operations controlled from outside the project areas. (A lower-value industry mix may be a contributing factor, but, is unlikely the dominant one.) High levels of locally controlled sales may provide greater long-term stability.
- While the business count index in the energetic transport-communications sector is 5% above US concentration levels, average establishment size is smaller than the US average, accounting for lower (but improving) employment indices. However, the sales index again reflects a major

concern; already low in 1998, it plunged to 42% below the US concentration level by 2005, suggesting a lack of dynamism among locally based firms and a probable increase in operations controlled from outside the project areas.

- The Finance-Insurance-Real Estate sector has been consistently and significantly under-represented. The business count index has moved very slightly toward US levels since 1998, but the proportion of project-area employment engaged in this sector remains 26% below the US average. The sales index has fallen significantly and is now only 80% of the US level, indicating weakness among locally controlled firms and a likely increase in control of businesses from outside the project areas.

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 (or extreme weakness in it) does make a region vulnerable. The point of the aggregate analysis here is to underscore the importance of projects which are geared toward, or result in, significant diversification of the specific project area or the larger region.

County-level diversification efforts reflected a perceived need to move away from high levels of dependence on (and decline of) traditional industries, most often in mining or textiles. In other situations, development efforts created entirely new economic environments for rural counties.

In most situations, ARC investments focused on value-added manufacturing growth. However, a new twist in this evaluation round was the emphasis put by several areas on distribution, health care and community revitalization in the form of projects that affected retail vitality. When investments fell within already high manufacturing concentrations, they rarely added to industries on which counties were already highly reliant. Rather, ARC investments went into varying local area industrial operations, aiding stabilization efforts within the high-value, high-multiplier manufacturing sector. The higher quality of jobs resulting from ARC investments was an often-heard theme in the interview process. In a wide majority of cases, industrial park and business incubator development created the conditions for a variety of new and expanding firms to thrive in several different industries. Business incubators, water projects that opened new residential and commercial sites, and some industrial projects played an ongoing role in community diversification efforts.

In sum, the project sample clearly reflected successful efforts to move local economies in the Region away from traditional reliance on often declining industries. 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.

Healthcare Development

Projects in three different classifications focused on assistance to the healthcare industry as a means of elevating the level of local care and augmenting economic stability in their respective project areas:

- Coaldale Site Development (Schuylkill County, PA): This project enabled the local hospital, the largest employer in the industrial park, to expand operations including the emergency center, improving medical access for county residents and creating 40 new jobs to date. (The county has high manufacturing and mining indices, and lower than average service employment concentrations, which this project helped elevate toward national norms.) The project included development of an access road to circumvent nearby residential neighborhoods, improving the quality of life.
- Hancock County Picture Archiving Communications system (Sneedville, TN): This project involved the acquisition of tele-radiology equipment for a new hospital facility in Sneedville. An estimated private investment of over \$6 million was leveraged by the project, which could create a regional customer attractor due to the technology involved. Thirty-two medical-related jobs were created in an area with very high employment indices in both manufacturing and agriculture.
- Icard Water Improvement/Carolina Health Care Center (Burke, NC): This project involved water system improvements needed for new nursing home investment in the community. As a result of the project, over 240 jobs were retained and 115 new jobs created, mitigating the county's strong dependence on manufacturing without decreasing manufacturing jobs.
- Jackson Water Storage Tank Replacement (Breathitt County, KY): This project was a contributing factor in the addition of 75 hospital jobs in a distressed county as a by-product of a larger effort to serve over 2300 households with an improved water system. Already strong service sector employment received a boost, helping to balancing high employment indices in retail, mining and transport-communications.

Distribution

Several projects focused --or inadvertently created -- new warehouse and distribution centers in at least one distressed and three at-risk project areas.

- Fort Payne Distribution Center Utilities (DeKalb County, AL) involved the extension of utility lines to a new wholesale distributor. Stakeholders had

focused on locating new “clean” industries on the site and were successful in creating 200 new jobs to date. Results of the project have helped to elevate the low wholesale and distribution employment indices in the county area.

- Monroe County Industrial Building (Monroe County, MS): This project focused on manufacturing, but resulted in the development of a warehousing and assembly furniture facility (private investment \$3.2 million) and the creation of 100 new jobs. The area already shows a high manufacturing employment index (1.85) but a transportation-communications employment index 36% below the US level, which should receive a boost from this development.
- Morehead 801 Industrial Park Water Storage Tank (Rowan County, KY): This project included the development of a water tank needed to serve a 75-acre industrial site whose largest tenant is a Family Dollar distribution center utilizing over 200 trucks per day. The project retained 410 jobs in an area with a low (0.48) transportation-communications employment index.
- Tompkinsville Industrial Park Development (Tompkinsville, KY): The development of this industrial park includes plans (not yet implemented) for a medical supply company projecting 50 wholesale jobs. In this instance, the area already reflects strong wholesale and manufacturing indices.

Tourism Development

Tourism development has taken hold as a diversification strategy in many parts of the Appalachian Region. Although these are often secondary objectives and almost always unaccompanied by outcomes, significant numbers of projects (almost 10% of the sample) include tourism in their discussion of the impacts of various projects:

Tourism diversification efforts and impacts include:

- Brushfork Sewer Project (Mercer County, WV): This sewer project connected almost 600 customers and helped clean the local river, a tourist destination, which was being used as a sewage dump, obviously enhancing the area’s tourism attraction efforts.
- Dawsonville Water System Improvements (Dawsonville, KY) was designed to assist a major tourism project (the Thunder Road Racing Museum)
- Hammondsport Industrial Access Road (Hammondsport, NY): This access road project including servicing the needs of the area’s important and growing wine (and winery tour) industry.

- Robbinsville Sewer Line Extension (Robbinsville, NC): This water-sewer project extended a sewer line south of town, serving general residential and commercial needs in this distressed county, which is experiencing modest but discernible tourism growth. Stakeholders feel that the project was an important one to businesses involved in the tourism industry.
- Tompkinsville Industrial Park Development (Tompkinsville, KY): This primarily industrial-focus project is credited by stakeholders as creating a new push for downtown revitalization and tourism.
- Watkins Glen Second Street Water/Sewer Upgrade (Watkins Glen, NY): The project upgraded systems serving residential and commercial customers, reportedly increasing the area's Main Street and tourist attraction efforts, which include a natural gorge (park) attraction as well as a regional wine industry and a NASCAR racetrack and annual rally.

Prison Development

Projects that have supported new prisons have produced numerous well-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 examples from the project pool include:

- Paintsville, KY: The Paintsville-Honey Branch Wastewater project was an \$8.8 million project (ARC investment: \$400,000) that involved the development of a wastewater treatment plant and more than nine miles of sewer line to serve a new federal prison at the Honey Branch Industrial site. The prison has created 400 new jobs in this multi-county area (including distressed counties), and additionally diversified the local economy by creating a demand for supplies from the prison, as well as retail and service amenities for visiting families. Airport activity has reportedly increased as well. The fact that the industrial site is now properly served also resulted in the relocation of an existing oil services firm which would have otherwise moved from the area. This area had been heavily over-represented in the mining sector and far behind the US concentration levels in services prior to this project.
- McCreary County, KY: The McCreary County Prison Infrastructure project developed a new sewer system to serve a one thousand bed federal prison. The prison has created 400 new jobs in this distressed county. It has spurred hotel and restaurant development as well, and stakeholders are optimistic about current plans for additional retail and service outlets. This area had

heavy representation in the manufacturing sector and a low service sector business count index before this project.

Other Industrial and Commercial Diversification Projects

Some of the most interesting projects did not fall into common categories, but involved a variety of outreach and diversification efforts toward companies and industries that were unusual for their area or the Region. These fell generally into industrial and commercial categories:

Examples of other industrial-related diversification:

- **Brushfork Sewer Project (Mercer WV):** In addition to enhancing area tourism, this project involved the location of a new telecommunications firm in an area with a low communications sales index and a sector employment index that had dropped since 1998 to 17% below US levels in this at-risk project area.
- **Endless Mountains Industrial Building Renovation (Sullivan County, PA):** This project involved rehabilitation of an existing facility into a multi-site manufacturing complex. Results included the location of a bio-medical company unique to the area.
- **Jenkins Industrial Site Infrastructure (Letcher County, KY):** This project involved improvement to an industrial park, resulting in the location of a data processing center and a gas industry service firm, as well as at least one commercial business, enhancing diversity but not yet making progress on very weak area manufacturing indices.
- **Logan-Hocking Industrial Park (Hocking, OH)** included the development of a new industrial park. While the park itself is experiencing modest development (two companies to date), a third (alternative fuels) firm has developed as site near the industrial park as a result of the project, including five related buildings.
- **The Rock Springs Industrial Park Improvements project (Walker County, GA)** has attracted a \$10 million investment from a Japanese food processor and construction of an automotive parts facility in an area heavily dependent on textile manufacturing.

Examples of other commercial-related diversification:

- **The Gaffney-Clary Wastewater Treatment Plan Upgrade (Cherokee, SC)** was an industrially-focused project that also resulted in unanticipated retail and educational spin-offs.

- The Winder Sewer System Expansion Project (Barrow County, GA) was largely a housing project that has resulted in added commercial development activity and the planned location of a new “big box” regional store.
- The Salt Lick Sewer Collection System (Salt Lick, KY) developed a wastewater collection and treatment system focused on household service, but which has resulted in additional downtown and educational development, including a new school, a new downtown bank and other downtown commercial enterprises that would not have otherwise located there.
- The Madison County Water System Improvements project (Madison, GA) enabled investment from two diverse sources -- a downtown supermarket and a higher educational institution (total investment of \$9 million from both). The new school created a demand for housing and retail development, including a mini-mall and pharmacy. The mini-mall alone supports fifty new jobs.
- Taylorsville Industrial Water (Taylorsville, NC): This project developed a 0.9 mile water line extension to serve a commercial area. The project leveraged \$3 million in private investment, including the development of a regional Wal-Mart facility and 135 new jobs (in an area with a wholesale business count index 25% below US levels and an even lower wholesale sector employment concentration index). Transport-Communications employment indices are also very low, and the retail employment index is 19% less than the US average concentration.

Re-Use Projects

Almost by their nature, projects involving rehabilitation and re-use of existing facilities, most often industrial, provide a venue for diversification efforts. Invariably, the projects enhance not only immediate employment and serve tenant firms, but augment the general desirability of the larger surrounding area by putting abandoned buildings or vacant brownfield sites to productive use. 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.

Our project pool included at least five projects within this specialized re-use category, two of them in distressed counties:

- Blue Ridge Tele-center Development (Alleghany County, NC): Possibly the ultimate in re-use is the rehab of an older industrial plant into a high technology service -- precisely the format applied to this telecommunications project, whose objective is to provide daily technical assistance to project area firms (twelve to date). The project is credited with creating 46 jobs in a technology field, in an area with very low business count, sales and employment industries in the corresponding sector.
- Cambria Iron Works Complex Repair and Rehabilitation (Johnstown, PA): A more traditional re-use project, the Cambria Iron Works re-use rehabilitated a heavy industry facility (listed on the national historical register) into a suitable home for smaller machine shop and carpentry firms. Although the project has not yet attained its stated job creation objectives, it is on its way since its 2004 completion.
- Cumberland Rolling Mill Infrastructure (Cumberland, MD): This project improved the infrastructure of a commercial development built on the site of an older primary metals facility and railroad property in a low-income neighborhood. The retail-oriented development now includes a supermarket and a variety of locally owned small retail and service operations which have created 200 new jobs. The availability of localized services has enhanced neighborhood quality of life.
- Fay-Penn Business Center Improvement Over-run (Fayette, PA): This project helped transform an abandoned plastics molding facility into a multi-tenant building which is fully operational and occupied. The site (two tenants and 93 jobs, significantly exceeding projections) is strategically situated on a viable industrial strip across from the local campus of Pennsylvania State University.
- Irvine Downtown Project (Irvine, KY): This project took a different approach to re-use, converting three older downtown buildings into thirty one-bedroom units for low-income seniors. While the focus of the project was the re-use itself and the provision of elderly housing, its strategic location appears to have had a significant impact on the downtown area, reportedly sparking \$600,000 in new downtown spending and spurring new businesses supported in part by the results of the project. Project stakeholders testified that the town is "now being brought back to life" as a result of the residential rehabilitation and re-use.
- ReltoC Building Renovation (Colbert, AL): The creation of the Shoals Entrepreneurial Center in an old industrial building slated for demolition was an explicit effort to put new entrepreneurial life into a community and create a diversification effort to combat the area's historic reliance on troubled segments of the textile industry. Plans call for up to ten light manufacturing enterprises (five have located to date) in an area that struggles with a startup activity index 27% below the national level.

5.2 Support for Traditional Industries

In an effort to shore up long-term businesses or a traditional industrial base, several projects were developed to serve company-specific retention needs. Some of these in fact served a single firm, while others were developed, or naturally served, to extend infrastructure improvements to multiple firms. In all, the projects summarized below created more than 700 jobs and retained over 1,700, all in transitional or (one) distressed county. In more than one case, the major business to be served suffered a significant reduction in force during or shortly after project completion.

- Big Flats Sewer system Improvements (Chemung, NY): This project assisted three businesses, including the long term are mainstay Corning. Overall, the project retained 222 jobs and created 10, primarily as a result of an expansion of Corning's Science Products Division, a technology-edged segment of the business. The project also facilitated further development of a nearby retail district.
- Dushore Borough/Cherry Township Water Extension (Sullivan County, PA): This project assisted an expansion of a large dry cleaning equipment manufacturer in this smaller jurisdiction. As an ancillary motivation, the water line improvements also affected fifty-five households.
- Greenville Hardin Industrial Park (Greenville, TN): This project was designed to help locate a large truck component manufacturer in a local industrial park, creating 300 jobs over a five-year period, and attracting \$15 million private investment.
- Hammondsport Industrial Access Road (Hammondsport, NY): This project was primarily designed to serve a large aircraft component manufacturer that downsized at the start of the project but remained in the area. The access road fulfilled secondary purposes, including service to residential communities and the regional winery tourism industry.
- Hardy County Industrial Building (Hardy, WV): This project brought a new player into the region's traditional wood products industry, creating new cluster activity in the local area. Development is still short of projections.
- Johnson City Utility Line Relocation (Johnson City, TN): The project helped capture a private investment of over \$12 million and 250 new jobs from an appliance manufacturer (including headquarters). The larger vitality impact of the project has reportedly increased business interest in the area and encouraged community morale.

- Mountain City Sewer Line Extension (Mountain City, TN): This project primarily served a local glove manufacturer which was able to temporarily maintain operations, reportedly as a result of the assistance from this project, but closed a few years later. The project also extended sewer service to approximately 50 new residential households as well as commercial property. This was perhaps the only project in the sample of which a stakeholder conceded that "...in hindsight the town had water and sewer needs (that should have been) met instead".
- Prescott Avenue Industrial Access Road (Chemung County, NY): This project primarily served a large longer-term glass manufacturer, facilitating expansion and the addition of fifty new jobs. The company invested an estimated \$90 million. The access road also facilitated the development of another (unrelated) commercial brownfield site.
- Valley Head Sewer System (Valley Head, AL): This project enabled a textile plant -- the only large manufacturer in the area -- to retain and create over 400 local jobs, averting a major rupture in the county economy.

5.3 Speculative Development Efforts

Speculative development efforts -- relying on the "build it and they will come" perspective -- are often controversial. Difficult projects look like a waste of time and money after the fact, but successful projects look like genius at work. Our sample pool included a mix of speculative site projects that returned strong, mixed and (to-date, at least) weak results.

For our purposes, what defines a speculative development effort? It is the development of a site for the sole purpose of selling or renting to industrial users who are not on the horizon at the time that the scope of the project is determined. This would exclude re-use projects, even brownfields, which have other important community revitalization purposes, such as blight eradication. It also excludes more predictable commercial, retail and residential development efforts, even when those projects call for greenfields development. We are not insisting that this is the only proper definition for speculative development, but it is the one we utilize here to develop an apples-to-apples perspective on a category of projects undertaken in this sample pool.

Reported job creation and businesses served in the following speculative projects were at or above projections, regardless of the project completion year.

- Macedonia Industrial Park Phase I (Roane, TN): This project was only completed in 2004, but already claims fulfillment of 80% of its job creation objective (401 of 500 projected jobs). Additional spin-off jobs have been created and the larger park project also improved road infrastructure in the area. Experience has been solid enough so that a speculative building is now being constructed in the park. This is a transitional county.
- Mount Hope South Industrial Park (Fayette (WV): This project was conceived in a distressed county which has now advanced to at-risk designation. New job creation has exceeded projections by several multiples (125 projected, 500 actual). Private investment has been substantial. Direct spin-offs and induced benefits are reportedly substantial. ARC investment returned one new job for less than \$3500 per job.
- Northeast MS Regional Water Supply Facilities (Lee, MS): This project created area-wide water treatment improvements, but with the specific intention of job creation. Stakeholders are firm that the local (North Lee) industrial park would not exist without the benefits of this project. Business growth since has far exceeded expectations, including five new firms (rather than the projected two) with 1200 jobs (four times the projection for this project). This is a transitional county.
- Pickens County 18 Mile Creek Regional Sewer (Pickens, SC): This was another water-sewer project with specific (non-residential) development projections. Stakeholders say that in the last 18 months, the area has attracted \$50 million in private investment as a result of project-driven improvements, resulting in 850 new jobs with sixteen additional businesses locating to the area. This effort veers slightly from our definition since existing business (and jobs retained) were also served. This is a transitional county.

The following projects have been partially developed. They report outcomes somewhat below projections, but completion time frames may be recent or experience to date may be generating cause for optimism among stakeholders:

- Belmont County Fox Commerce Park (Belmont OH): This project was completed in 2003 and reports 109 new jobs created of the originally anticipated 300. Stakeholders state that the park will meet the goal of filling the park completely within ten years. Five companies are currently under negotiation to locate in the park and would bring an additional 261 jobs. This is a transitional county.
- County Line Industrial Park/Smoke Rise Sewer (Blount, AL): This project anticipated 185 new jobs and reports only ten. Stakeholders attribute much of the difference to a shortfall in funds, so that only a portion of the original project scope could be completed. There was some internal debate about

whether to complete the industrial park or sewer segment first, and disagreement continues about the decision that was made. One company has located on the site, and two other sites have been sold but not developed, possibly as a result of the uncompleted sewer project segment, which (when completed) may alter the outlook for the industrial park. This is a transitional county.

- Crestwood Industrial Park Expansion (Luzerne, PA): This project was completed in 2002 in a transitional county. The larger project included access, water-sewer improvements, storm management, utility services, as well as the construction of seven buildings, including three speculative buildings. The project anticipated 1200 new jobs and ten new businesses. It was fueled by the perception that the area is woefully short of developable land. Stakeholders report the actual creation of 413 jobs and three new businesses as a result of the project. Despite the substantial outcomes shortfall, the ARC investment has yielded one new job per \$4941 by the more conservative ARC share calculation.
- Hardy County Industrial Building (Hardy, WV): This project anticipated 200 new jobs and reports twenty since project closure in 2001. A single wood products firm has local in the speculative multi-tenant building. Results of this project are largely classified as ambiguous because of stakeholder assertion that additional wood cluster operations are showing vitality and may positively impact future development. This is a transitional county.
- Central Garrett Industrial Park Improvements (Garrett, MD): This project was completed in 2002. Stakeholders report one business retained (66 retained jobs plus an expansion) and one new business located at the site. Outcomes for retained jobs have been satisfied, but new jobs were originally projected at 85 and have been reported at 35 to-date. Much of the return appears to have been from an expansion of the large business retained, including private investment of \$2.5 million. The expansion was to a new, commanding lot on the site, freeing up an older, cramped facility for re-marketing. The retained firm is an international manufacturer of technology components, a valuable asset to the diversity of the county. Using the ARC share calculation, the ARC has invested over \$52,000 per new job in this project. This is a transitional county.

The following projects report little or no achievement of outcomes to-date, despite project completion dates early enough to raise some concern:

- Meadow Ridge Business Park (Greene, PA): This speculative business park site improvement project reports no post-project development despite a projection for 522 new jobs. The original business park to be served already had road and water done by time funds were available. As a result, the

project scope changed; funds were used to grade twelve acres for development. No jobs or businesses have been attracted as a direct result of project, but stakeholders expect future attraction. Results have likely been depressed since the project was only completed in 2004. This is a transitional county which had a distressed designation at the time of project approval.

- Columbia/Adair County Industrial Park (Adair (KY): This project (completed in 2004) was designed to provide eleven building sites at the Adair Industrial Park in at-risk Adair County. Stakeholders state that there has been no private investment to date because industry is not in a growth mode. 3,000 jobs were originally projected. This is an at-risk county, and was classified as transitional in the pre-project phase.
- Tompkinsville Industrial Park Development (Monroe KY): The industrial park improvement project was completed in this distressed county in 2002. Projections included three new businesses and 263 new jobs created. There are uncompleted plans for a distribution startup that could add fifty jobs within two years. Stakeholders seem optimistic about longer term efforts to market the 75 acre park.

5.4 Workforce Development and Job Quality

Several projects resulted in positive impacts on local work force training and upgrades, including:

- Belmont County Fox Commerce Park (Belmont, OH): This industrial park project created usable development property in an area which had little. Five businesses have already been located on the site and more are in negotiations. Several have brought jobs requiring locally-based training programs.
- Bessemer Airport Water Main Extension (Jefferson, AL): Expansion and improvement of water service in this community resulted in the creation of hundreds of new jobs and attraction of an ITT Institute job training facility to the newly served area.
- Browder Switch Industrial Park Infrastructure (Marion, TN): Infrastructure improvements to an industrial park helped locate a new industrial tenant, sparked private investment and required work force training to match the skill sets required by the for new area heavy manufacturing industry.
- Kemper County Incubator Expansion (Kemper, MS): Stakeholders attribute the local community college training programs, in part, to the success of this incubator project (and vice versa).

- Mount Hope South Industrial Park (Fayette, WV): Additional work force development programs have been established to satisfy the requirements of the 550 jobs already created by this successful industrial park project.
- Mountain Empire Regional Business Incubator (Lee-Scott-Wise, VA): This very successful incubator project, serving 43 companies, has required the development of new work force skills and training programs to provide them.
- Rock Springs Industrial Park Improvements (Walker, GA): This project helped locate an automotive parts manufacturer in this transitional county industrial park. The park is adjacent to the Northwest Technical College, which provides technical training, including the Quickstart program which served many of the employees hired by the new company.

In addition, several stakeholders noted that improved conditions generated by ARC investments tended to result in higher-quality jobs and employment. A sampling of these includes:

- Belmont County Fox Commerce Park (Belmont, OH): Stakeholders of this industrial park project commented on the higher quality jobs and wages paid by businesses attracted as a result of this project.
- Monroe Industrial Park Building (Monroe, OH): The new business serviced by this project (metal and powder coating) increased incomes and provided jobs which stakeholders report have enhanced quality of life.
- Pickens County 18 Mile Creek Regional Sewer (Pickens, SC): This sewer project sparked extensive levels of development activity, creating 850 new jobs, far over projections. Stakeholders report that many of the new jobs are “high tech and high paying”.
- Greenville Hardin Industrial Park (Greenville, TN) reports jobs paying wages about 20% above the anticipated average wage for 300 new jobs at a transportation equipment manufacturing plant.
- Washington County Industrial Park Water & Sewer Line Extension (Washington, TN) enabled the location of a large manufacturer and 375 new jobs. Stakeholders report on the high quality of employment and positive work force and community relations fostered by the employer.

5.6 Community Service Impacts

In addition to projects focused on the development or expansion of medical facilities (discussed in the section 5.1 Economic Diversification segment on Healthcare Development) several projects enhanced community services efforts in their local areas, including:

- Clifty Heights Elderly Rental Housing (Pulaski, KY) constructed a rental housing complex for elderly, low-income families. Stakeholders report that spin-off community development from this project includes a Boys and Girls club and a Domestic Abuse Violence Center and an after-school. A community center has opened next to the project.
- Hardy County Industrial Building (Hardy, WV): This developing industrial park project was successful in catalyzing follow-up work (and an ARC grant) to open a successful day care center in the industrial park.
- Irvine Downtown Project (Estill, KY): Created thirty senior housing units from three older downtown buildings, sparking a business renaissance in the downtown area. The project focused on a small town where one-third of the main street block had been condemned. The new population triggered \$600,000 in additional sales for long-term downtown shops.
- Jefferson Water & Sewer Extension (Ashe, NC): The project renovated a school building which was converted into a one stop family services center. The former high school building now houses Family Central (including a day care center), North Carolina Cooperative Extension, an alternative school for at-risk youth, the Literacy League, New River Behavioral Health Care (developmentally disabled services), Joblink Center and the Employment Security office.
- Safe Harbor Transitional Housing (Floyd, KY): This project renovated a portion of a community facility for use as transitional housing for low income individuals and families. The center is now used not only for emergency shelter, but also for or receptions and weddings, etc. Stakeholders content that it is “really the center of the community”. Low-income residents were hired to work on the project, which also utilized locally-purchased materials.
- Stoney Fork/Red Bird/Saylor Hollow Water (Bell, KY): This water-sewer project was designed to served 180 households, but stakeholders reported unanticipated positive impacts on the local senior citizen and child development centers.
- Winder Sewer System Expansion (Barrow, GA): This residential project was designed in part to serve a senior housing community and medical complex. The project has been slow taking hold but is now in the development process,

and expected to have a major impact on area neighborhoods, senior housing and medical facilities.

5.7 Distressed Community Impacts

Thirty-six projects in the sample pool (35%) were developed in 32 single county impact areas which were classified as distressed in the pre-project stage. Another eight were identified multi-county impact areas that included at least one distressed county prior to project implementation. In all, 42% of all sample projects impacted distressed counties. The projects covered 40 different project impact areas with at least partial distress designation.

Of the forty project areas represented in the sample pool, sixteen (40%) improved their distress designation in the post-project review; that is, 40% of the distressed county projects moved from distress designations to either the “higher” at-risk or transitional categories between project initiation until after project closure. (The years varied depending on the timing of each project.)

Table 5.2 Distressed Pre-Project/Post-Project Designations									
	Pre-Project Distress		Post-Project Designations					Improved	% Improved
	Single County	Multi-County 1+ Distressed	Single Distressed	Multi-County		At-Risk	Transitional		
				1+ Distressed	No Distress				
AL	1		1					0 of 1	0%
KY	12	3	9	2	1	3		4 of 12	33%
MS	4	2	2	1		2	1	3 of 6	50%
NC	1	1	1	1				0 of 1	0%
OH	3		2				1	1 of 3	33%
PA	2					2		2 of 2	100%
TN	4		3			1		1 of 4	25%
VA	2	1			1	2		3 of 3	100%
WV	3	1	2		1	1		2 of 4	50%
Total	32	8	20	4	3	11	2	16 of 40	40%

Among the single county impact area projects, two (Monroe, OH and Greene, PA) were elevated from distressed to the higher transitional classification, while another ten moved from distressed to at-risk designations (Pike, Rowan and Lincoln, KY; Monroe and Tishomingo, MS; Fayette, PA; Pickett, TN; Buchanan

and Wise, VA; and Fayette, WV). Although the number of original distress designations in each state was relatively small, Table 5.2 indicates that Mississippi, Pennsylvania, Virginia and West Virginia all experienced upward mobility in at least half of their project areas that began with distress designations. Kentucky, which started the process with the most distressed counties in the sample pool (12) also had the most (4) that were re-classified upward in the post-project period.

There were significant outcomes in distressed counties as well. Table 5.3 details more than 3,400 new jobs created and over one thousand retained, as well as 345 new businesses served, mainly in Kentucky. As the site of all four of the sample pool housing projects, Kentucky also had the largest number of households served, both new and existing.

In the four states with the greatest movement out of distress designations among project pool areas, Kentucky, Mississippi, Virginia and West Virginia benefited most significantly to-date from these specific projects. Projects in Pennsylvania did not significantly affect the two counties that moved from distressed to at-risk and transitional during the time period under review.

Table 5.3 Project Outcomes in All Pre-Project Impact w/ Distress*						
	Jobs Created		Business Served		Households Served	
	Created	Retained	New	Retained	New	Existing
AL	0	50	0	0	95	0
KY	1,425	660	186	8	6,554	3,177
MS	355	150	2	6	40	820
NC	57	53	39	0	0	0
OH	40	0	1	0	83	0
PA	78	15	3	2	0	0
TN	42	40	0	1	903	0
VA	320	100	23	20	405	0
WV	866	0	67	0	864	0
Total	3,183	1,068	321	37	8,944	3,997

While no causal relationship can be ascertained, an analysis of the projects in counties that moved from “distressed” to “at-risk” or “transitional” designations suggests that project investments in several of these were significant contributing factors in elevating county status. A review of impacts of economic development projects in areas moving from distressed to higher classifications follows. Nine projects areas of the sixteen which progressed from distressed designations developed projects with a core economic development component. (Projects which did not have identifiable economic development objectives or outcomes

are not reviewed here, even if they were sponsored in areas which progressed from distress to a higher classification.) Of the nine, at least three reported impacts which had a significant role in elevating county distress designations.

Highest Relative Impacts:

- Morehead 801 Industrial Park Water Storage Tank (Rowan, KY): This project brought 500 new jobs to this formerly distressed county, including a large Family Dollar distribution center. The project also retained 410 jobs. It is estimated that the project impacts increased the private sector employment in the county by almost 5%.
- The Mountain Empire Regional Business Incubator Project (Lee-Scott-Wise, VA) has attracted several tenants and helped create 320 new jobs (retaining 100) while serving 46 new and longer-term businesses. Added skills training was required to satisfy the requirements of many of the new jobs. The project has created or retained about 2% of private sector employment in the three county area. The project itself is located in distressed Wise County, where the impact is projected as more than 4% of private sector employment.
- Mount Hope South Industrial Park (Fayette, WV): This project has had a clear and measurable impact. This industrial park has exceeded expectations and helped create 550 new jobs in the county, which calculates to approximately 4.8% of the private sector employment total.

Mid-Level Or Unknown Impacts:

- Monroe County industrial Building (Monroe, MS): Although this project developed as more of a storage and assembly facility than the manufacturing plant that stakeholders had hoped for, the area nonetheless benefited from the creation of one hundred new jobs. The newly created jobs account for a little under 1% of private sector employment in the project area.
- Monroe Industrial Park Building (Monroe, OH): This project constructed a manufacturing building to serve a single business startup in the industrial park. The project developed forty new jobs and a private investment of about \$1.2 million, accounting for about 0.6% of the private sector employment in the project area.
- Phelps/ Buskirk Sanitary Sewer System (Pike, KY): This project extended sanitary sewage to more than 900 homes and 177 businesses. Unfortunately, there were no job impacts projected, or job outcomes reported in the file or by stakeholders, limiting the opportunity to assess the impact of this project on the county's progress.

Low-Level Impacts to Date:

- Meadow Ridge Business Park (Greene, PA): This site development effort resulted in no newly created jobs to-date.
- Keystone Opportunity Zone Site Development Plans (Fayette, PA): This planning project has not yet been implemented and has resulted in no newly created jobs to-date. Another project in the same county, the Fay-Penn business Center Improvement, produced 78 new jobs and retained fifteen, affecting a small proportion of the county work force. Note that implementation was not part of the project investment scope in this instance.
- Upper Kanawha Valley Technology Center (Fayette-Kanawha, WV): While this technology center and incubator has shown little job impact to date, stakeholders are optimistic that the planned National Printing Innovation Center will generate support and spin-off businesses that will utilize the Center. In the meantime, the project appears to have had little influence on the change in distress designation in the area.

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

Many 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. Projects designed primarily to mitigate these sorts of environmental problems fell into the water-sewer category in this evaluation round, and are largely reviewed in that section.

However, other projects contribute to community quality of life in less noticeable ways, by reducing 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, but they are worth noting:

- Safe Harbor Transitional Housing (Floyd, KY) developed an emergency housing and community services facility which is now used for a very wide array of community services, events and celebrations. Area residents had previously traveled up to 30 miles to reach similar services.
- Western MD Regional Video Switched Network (Allegheny-Garrett-Washington, MD): One of the tangible benefits cited to this rural telecommunications projects in low-income areas is reduced fuel due to less required travel.

- Cumberland Rolling Mill Infrastructure (Allegany, MD): This successful commercial project has developed retail and service outlets much closer to lower income residents, who were previously forced to travel a significant distance for basic shopping and services.
- Monroe County Industrial Building (Monroe, MS): Prior to the project, county residents largely had to travel considerable distances to work. The new development reduced their commute and drew in workers from other areas, increasing spending in the project area.
- Huntsville Infrastructure/Research Park (Madison, AL): Conversely, this wildly successful project in a competitive county reports traffic congestion problems due to large-scale development and business activity, and the need for future projects to alleviate congestion.

6. Economic Conditions in Project Areas

Long range goals of ARC investments include the encouragement of economic diversity, competitiveness, self-sufficiency, and entrepreneurial vitality in areas of need. Thus, this evaluation attempts to measure the extent to which the local project areas are fostering economic diversification, economic growth vitality, and entrepreneurial success.

Because it is so difficult to draw a straight line from specific projects to overall area vitality, these measures are included as baseline indicators of progress over the impact period, rather than as a direct reflection of project impacts or consequences. The various time periods for project start, dates, end dates and the necessary project maturation time frames (which in themselves vary between projects and classifications) also cloud any attempt to draw a causal relationship between projects and statistical area progress. In some cases, growth or diversification analyses clearly reflect high job creation resulting from an ARC investment (e.g., Huntsville Research Park, an earlier phase of which was included in an earlier evaluation round). In other cases, the vitality assessment may highlight the need for particular types of assistance (for example, to facilitate entrepreneurship, or work in a more focused way on retained firm growth). 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.

Note: It would be misleading to interpret evaluations of individual or aggregate projects areas as Regional metrics, or (regardless of classifications by state or otherwise) as reflective of anything but the project areas themselves.

The measures of economic conditions in projects areas were based on these metrics:

- **Economic Diversification:** The assessment developed an economic diversification index at three different points in time. The index measures the percentage of a given sector against the area economy as a whole, and then compares that percentage to the same national measurement. The index was developed at the sector level for three economic bellwethers: business counts, employment and reported sales.
- **Business Scale and Growth:** The evaluation measured the scale of business operations in each area by employment and class category at different points in time, and assessed whether the area mix was moving toward or away from US patterns which promote “normal” interaction and growth. In addition, firms which were operating at the start of the time series in 1998 were separately tracked in order to assess whether their growth patterns over the 1998-2004

analysis period matched, exceeded or fell behind national patterns for retained firms.

- **Startup Activity:** Entrepreneurial activity in each area was measured for three different time periods: 1998-2000; 2000-2002; and 2002-2004. In each case, identified startups (defined as firms reporting one year or less of operation) were compared to all firms in the area which reported the number of years they had been in business. The analysis included only area-based firms, not branch operations. The resulting startup rate was compared to national norms for each period.

So that the diverse measures included in the economic analysis can be easily digested, they are presented for each project impact area in an indexed format that compares the project area to the corresponding US average. In each case, the US average equals 1.00, and the relative measure for the project area is above or below 1.00 in the same proportion. For example, a project area index of 1.10 indicates that the project area is 10% above the US average; if 0.90, it is 10% below.

The index indicates different measures, and “high” is not always “good”. In some cases, the index is simply intuitive – an entrepreneurial vitality index above 1.00 indicates that the project area startup rate is above US averages, and can generally be taken as a positive reflection of area vitality. In most cases, however, index measures used in this section (and in the corresponding project area-specific thumbnail reports in the appendices) simply indicate a proportion of firms in a sector, a sales category or an employment category that is lower or higher than the US concentration in the corresponding category. The meaning of the index in these cases is purely subjective. For example, a concentration of 1.20 in manufacturing employment (20% above national concentrations) could be positive or negative, depending on the situation and development objectives of the individual project area. In other words, the most meaningful interpretations are at the local level. Broader points that can be drawn (entrepreneurial vitality for example) are developed in this section, but the reader is encouraged to review the appendices for more detail and interpretation in each project area.

Where sales data is developed, it reflects only the reports of firms based in the project area. Sales attributable to branch operations are reported through headquarters, so branch operations based outside the project area will usually report local employment, but not local sales. This mechanism limits the full view of economic activity in an area (especially areas, such as some ARC counties, which significantly rely on “foreign” branch operations). Partly for this reason, business count and employment indices (which include all business establishments) are included in the diversification analyses. These different perspectives can also be read jointly as an indicator of reliance on operations based outside the project area. For example, if manufacturing employment and

business count indices are significantly higher than 1.00, and the sales index is significantly below 1.00, it is a likely indication that branches are reporting high local employment levels but attributing sales elsewhere – in other words, that the area may be reliant on firms based outside the area.

The employment and sales class index also display area results which are relative to the spread of all US firms. While this spread will normally differ somewhat from the average, it's worth noting that the most important differences may occur at the top and bottom of the scales, which indicate if an area is overly reliant on very small or very large firms. Of particular interest are the “survivor” patterns, which indicate the seven-year growth levels of firms which were in operation at the start of the time series (1998) and maintained operation through the end (first quarter of 2005). Areas in which survivor firms actually increased their index concentration of very small firms may need to add focus on growth assistance to mature local companies, since their “survivors”, as a group, indicate less growth vitality than the national average.

A set of economic analyses was developed for project impact areas:

Growth, diversification and entrepreneurship analyses were developed using a variety of private sector credit reporting and other business databases for each project impact area, as defined by local interviewees, for the years 1998-2004.

Table 6.1 Economic Analysis Series							
		Times Series			Measurement	Major Indication	
Sector Concentrations							
	Business Count	1998	2002	2004	US = 1.00	diversity	
	Employment	1998	2002	2004	US = 1.00	diversity	
	Reported Sales	1998	2002	2004	US = 1.00	diversity	
Size Category Spread							
	Sales Class	1998	2004	* Survivors	US = 1.00	vitality	
	Employment Class	1998	2004	* Survivors	US = 1.00	vitality	
Startup Activity		1998-2000	2000-2002	2002-2004	US = 1.00	vitality	

* Businesses in operation in 1998 which maintained operations through 2004

Because projects in the database were initiated and completed over an eleven-year period (1993-2004), 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. [I] Since almost all of the analyzed projects were in counties currently designated as distressed or transitional, 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.

Unlike the economic vitality analysis in the previous evaluation, measures were developed to assess not just general growth, but to focus on strategic ARC objectives, including area economic diversity, the development of robust patterns of growth among area firms, and the incubation of a strong entrepreneurial culture.

Needless to say, these are difficult objectives to measure. This effort included the following analysis:

6.1 Diversification Analysis

Tables and discussion in this section reflect measurement in 91 differentiated project areas in order to avoid duplication of measures in areas that sponsored more than one project in the sample pool.

Table 6.2 Project Area Economic Concentrations Less Than 50% of US Average						
	Business Count		Employment		Reported Sales	
	1998	2004	1998	2004	1998	2004
Agriculture	21	16	30	22	19	10
Mining	34	28	39	42	57	40
Construction	5	2	10	8	5	6
Manufacturing	5	3	16	17	36	39
Transport-Commun.	1	1	22	17	59	58
Wholesale	5	2	30	20	20	16
Retail	0	0	0	1	2	3
Finance-Ins-Real Estate	2	1	54	39	60	66
Services	0	0	2	1	2	1

The diversification analysis measures business counts (firms and branches), employment and reported sales (of locally-based firms) in each project area for three different points in time: 1998, 2002 and 2004. Each snapshot was broken out for the nine SIC sectors and indexed against the proportion of the same sector in the US economy as a whole, where the US average equals 1.00.

Tables 6.2 and 6.3 show the number of project areas that fall into relative poles of the diversification index of each measure. The first row of the Business Count index in Table 6.2, for example, shows that 21 areas reported less than 50% of the US concentration of agricultural sector establishments in 1998; By the beginning of 2005, only 16 project areas showed that level of imbalance.

Conversely, Table 6.3 indicates that the number of project areas with more than 150% of the US concentration of agricultural establishments increased from 17 in 1998 to 23 by the end of 2004. Together, these suggest an increase in the concentration of agricultural establishments in a variety of project areas.

The analysis suggests a number of diversification-related trends in various sectors. Note that aggregated project area results are reviewed in Section 5.1 of this report.

Agriculture: The number of areas with a relatively heavy reliance on the agricultural sector (including agricultural services) is increasing. Of particular note, the number of area with very high sales concentrations has increased rapidly. The study did not develop an analysis of whether this reflects crop-related or value-added sector services with export/traded service potential, but this might be worth exploring.

Table 6.3 Project Area Economic Concentrations More Than 150% of US Average						
	Business Count		Employment		Reported Sales	
	1998	2004	1998	2004	1998	2004
Agriculture	17	23	18	20	35	48
Mining	34	30	34	30	22	20
Construction	8	9	7	7	46	46
Manufacturing	9	7	38	29	14	7
Transport-Commun.	15	14	6	9	5	5
Wholesale	0	0	3	5	9	17
Retail	5	5	6	6	39	16
Finance-Ins-Real Estate	0	0	1	1	2	4
Services	0	0	0	0	30	37

Note: Detailed results for all project areas are displayed in the appendices.

Mining: The number of areas with low business count and sales concentrations decreased, while low concentration employment areas increased slightly. High concentration areas remained relatively static relative to US averages. In short, it appears that mining-dependent areas largely remained so, while low concentration areas moved slightly toward US levels of activity, probably due to related services or cyclical activity.

Construction: Low concentration areas decreased slightly, although there was an increase of one low concentration sales area. The number of high concentration business count and employment areas also remained relatively stable. The most interesting aspect of the construction analysis was the finding that just over one-half of all project areas (46) reported construction sales concentrations more than 150% of the US average. This relatively heavy reliance on construction sales -- coupled with the much more normalized business count and employment indices -- could suggest three possible phenomena. First, there may be relatively high levels of construction activity in a large number of project areas, possibly stimulated in part by the projects themselves. Second, area-based firms may be engaging in relatively high levels of "exported" sales, that is, branching outside their base areas. And third, since employment (including branch employment) levels are closer to US concentrations, but sales levels are developed from area-base firms only, the strength of locally owned companies in this sector is strongly indicated. The reasons for this continued strength over time, and the particulars of sector industries, are beyond the current scope, but would be worth further investigation.

Manufacturing: In general, there are reductions at the extreme index poles in the manufacturing sector. Low business count concentration areas have decreased very slightly, and low employment areas (17) have remained stable. The number of areas with high concentrations of manufacturing business operations, employment and sales has all decreased, although 29 areas (32%) still indicate very high manufacturing employment dependency. This concern is compounded by the very high (and increasing) number of areas that indicate low manufacturing sales (43%). Since the (low) sales data emanates from locally based firms, and the (high) employment data includes branch operations, it is likely that widespread reliance on manufacturing operations controlled from outside each area persists. This mixed blessing makes the findings of the Entrepreneurial Vitality Index (below) all the more critical.

Transport-Communications: The diversification indices indicate significant weaknesses in the nationally dynamic transportation and communications industries. While 15 project areas report high concentrations of business operations and a smaller but increasing number (9) report high employment concentrations, only five indicate correspondingly high sales indices. This suggests few industry magnet areas, and fewer still with a core of locally based

firms. More disturbingly, while only one area reports an unusually low concentration of sector business operations, 64% of all project areas report sales concentrations that are less than 50% of the US average. This sector is clearly struggling and in need of attention, based on this regional sample.

Wholesale: Wholesale reports far fewer extreme trends than most other sectors. A relatively large number of project areas continues to report employment and sales indices less than 50% of the US average (20 and 16 respectively, of the 91 areas) but in both cases the number of low concentration areas decreased significantly between 1998 and 2004. Particularly high indices are concentrated in the sales index (17 areas or 19%, up from nine areas in 1998), indicating that locally based sales vitality is surpassing business count, employment and as a result, most likely, branch operations as well.

Retail: Likewise, the project areas show relatively little reliance at the extremes in the retail sector. Very few areas report business count, employment or sales indices at 50% or less of the US average. A slightly higher but still modest number of project areas indicate extraordinarily high business count and employment indices in the retail sector. A larger number of areas (16) indicate very high retail sales concentrations, but this is remarkably down from 39 areas reporting more than 150% of the US sales concentration in 1998. The reasons behind the drop — and whether it represents positive diversification or some less desirable dynamic — is unclear. It is possible that the shift reflects larger retail trends toward national chains, rather than local ownership, but this is only a guess. Further investigation is warranted.

Finance-Insurance-Real Estate: Along with manufacturing and transport-communications, the FIRE sector indicates the most troubling diversification indices. The sector indicates very little activity at the higher concentration extreme in any of the three diversification measures. There is also only a single area that reports less than 50% of the US business count index (although 54 report less than 80% of the US concentration). Of greatest concern, though, are the 43% of project areas that report sector employment concentrations less than 50% of the US average, coupled with a whopping 73% of all project areas that report sales concentrations that lag by the same amount or more. At best, this suggests sector operations heavily reliant on outside interests. More likely, it demonstrates an extreme lag in sector vitality in a high proportion of regional counties. Notably, the number of project areas which fall into this low sales index category increased by 10% (six additional areas) since 1998. As is the case in the communications sector, future focus on development here could be critical to vitality and diversification efforts.

Services: While the service sector does not indicate much activity at the extremes of the diversification indices, there is very high number of project areas (37, an increase of 23% from 1998) which report locally-based sales concentrations of 150% or more above the US level. While this may be a positive

dynamic for local control, it could also suggest a lack of outside interest and investment from the more innovative segments of the sector.

Table 6.4 displays project area sales concentrations by state which are more than 20% above and below US levels. More concentrated areas are shown for agriculture, mining and manufacturing, Appalachia's most traditional industry sectors, and those in which the most concern over disproportionately heavy representation have been voiced in the past. (Note that the sales index does not reflect sales attributable to branches based outside the project area.) The table also displays project areas by state which report sales concentrations less than 80% of the US level, also in selected sectors of concern: again, manufacturing, in addition to the more emerging growth sectors of transport-communications and finance-insurance-real estate.

Table 6.4 Project Areas by State: Sales Concentrations of Area-Based Firms							
	Project Areas in Sample pool	2004 Sales					
		> 120% US Concentration			< 80% US Concentration		
		Agriculture	Mining	Manufacture	Manufacture	* Trans-Comm	** F.I.R.E.
AL	8	5	0	4	3	6	6
GA	8	6	0	1	5	7	6
KY	17	8	8	0	14	14	15
MD	4	3	1	0	3	4	3
MS	9	9	0	4	3	8	7
NC	9	6	0	4	3	8	8
NY	3	2	1	1	1	3	3
OH	6	6	3	1	2	6	6
PA	8	6	2	1	6	6	8
SC	2	2	0	0	0	1	2
TN	8	5	0	3	4	4	7
VA	3	1	3	0	1	3	2
WV	6	1	3	0	6	4	5
Total	91	60	21	19	51	74	78

* Transportation-Communications

** Finance-Insurance-Real Estate

Kentucky, Mississippi, Ohio and Virginia maintain large proportions of project areas significantly reliant on resource-based economies (agriculture and mining). The characterization of resource-based economies is not meant as a criticism of the strength of these sectors, but rather as a signal of potential dependence on them relative to these areas weaknesses in higher value-added growth sectors. Thus, the fact that eight of 17 Kentucky project are heavily reliant on mining and/or agriculture is most important when coupled with the data indicating that

fourteen of those same counties show weak sales concentrations in manufacturing and transport-communications, while 15 report sales deficiencies in FIRE. Unfortunately, that same correlation is apparent in other resource-reliant states, at least when looking at the 91-area project sample pool.

By the same token, virtually all states suffer from relative sales weakness in the emerging transport-communications and FIRE sectors. Alabama, Mississippi, North Carolina, New York, Ohio, South Carolina and Virginia report relatively minor levels of weak project area manufacturing sales. But in transport-communications, all states except South Carolina and Tennessee report more than 50% of their project area with lagging sales indices, and in FIRE Virginia reports the lowest lagging proportion of 67%. Based on the sample pool, the weakness in robust, area based transport-communications and FIRE sales are a problem in almost every state of the Region.

6.2 Sales and Employment Class Trends

The Sales Class and Employment Class analyses reflect the relative concentration of firms of various sizes in project areas relative to US norms. All areas are represented at virtually all scales of and employment and sales, but the mix and trends among classifications add detail to the picture of area vitality and dynamism.

For each project area, the number of total business operations (employment class analysis) and firms (sales class analysis) in each category was developed. The percentage of these operations relative to the total was then compared to US concentrations in order to show the relative importance of that class of firms to the areas economic life. Detailed results for all project areas are displayed in the appendices.

The smallest sales class analyzed was firms reporting under \$200,000 annual sales. The largest sales class analyzed was over \$100 million annual reported sales. Only data from locally based firms was utilized. Data from non-reporting firms was excluded from the sample.

The smallest employment class utilized in the analysis was 1-4 full time equivalent employees. The largest class developed was 250-plus employees. Branch operations were included in the employment analysis. And again, data from non-reporting firms was excluded from the sample.

In general, the analysis of the poles of the Employment Class and Sales Class indices indicates significantly higher than average (US) representation among both the smallest and largest business operations.

The firms that we began tracking in 1998 and that were still in business in 2004 we refer to here as “mature” or “survivor” firms. The mature firms we reviewed in Appalachian areas grew less than the national rate of that peer group (using annual reported sales as a benchmark). We also found that, in an uncomfortable number of cases, the proportion of mature firms in Appalachian areas which fell into very small sales classes actually increased over time. Moreover, we saw (from the separate entrepreneurial activity analysis) that many Appalachian areas coupled the “mature firm growth” problems with sluggish entrepreneurial activity.

Among the smallest sales class firms, the number of project areas reporting high concentrations of the smallest firms, while still high at 27 areas, declined significantly between 1998 and the start of 2005. The number of areas reporting high levels of the smallest establishments by employment doubled, but the overall number of areas (four in 1998, eight at the end of 2004) was relatively low.

Table 6.5 Project Areas: Business Class Concentrations						
	Sales (Firms)			Employment (Establishments)		
	1998	2004 Survivors		1998	2004 Survivors	
Smallest Business Class						
> 110% US Average	42	27	43	4	8	26
> 120% US Average	8	1	19	0	0	4
Largest Business Class						
> 110% US Average	11	9	13	39	33	22
> 120% US Average	8	7	11	29	25	20

The number of areas reporting high concentrations of the largest firms by sales remained stable overall, with a decrease of only two project areas indicating more than either 110% or 120% of the US concentration. Many project areas reported higher concentrations of the large employment operations, but the number of areas qualifying in this category (more than 150% of the US concentration level) declined about 15% between 1998 and 2004.

In sum, the 1998 and 2004 snapshot analyses (that is, the then-current picture) of both employment and sales class trends create a picture of project areas more dependent on very small and large firms than the US average, but moving toward US norms over time in both sales and employment measures. The decline in the number of project areas with high concentrations of large firms by employment is

likely indicative of decline in branch operations, since the decline is not matched by the decline in high level sales firms.

However, the analysis of sales and employment class trends among survivor firms tells a different story. Here the analysis deals with the same project areas, but the “survivor” group includes only those firms (or, in the employment class analysis, establishments) which were operating in 1998 and maintained operations throughout the time series, until at least the beginning of 2005.

In general, survivor firms indicate lower levels of sales and employment growth than the “snapshot” firms, which include newer operations. In this case, the sample indicates increased numbers of project areas which report unusually small survivor firms (43 or 47%, compared to the snapshot of the same time, which shows only 30% of project areas with smallest sales category concentrations 110% over the US level). Even more disturbing, while the snapshot indicates only one project area with a smallest sales category index of more than 120% of the US average, 19 areas report that level among survivor firms. This means that higher proportions of mature firms in project areas have fallen behind relative to their peers at the national level. To the extent that it has not, the region would benefit from a retention analysis that enhances its assistance to mature area firms. The number of project areas reporting high concentrations of firms in the largest sales class (13) pales next to the number reporting high levels of retained firms in the smallest sales category (43). The trend is less pronounced, but consistent, where the index filter is raised to 120%.

In the employment class index, the number of project areas reporting high concentrations of survivor firms in the smallest employment class has increased 650% (from four to 26), while the project areas reporting high concentrations of larger firms has dropped dramatically (from 39 areas to 22). This suggests that the relatively sluggish performance of retained firms (when compared to their peers nationally) cuts across both locally based firms and branch operations.

Table 6.6 below looks at selected small sales class index measures by state and highlights particular areas of concern. Just as the broader analysis identified survivor (retained firm) sales growth as a potential problem, the state analysis identified concentrated areas where survivor sales appear to lag. Georgia, Mississippi, North Carolina, New York and Tennessee all include unusually high percentages of projects areas with smallest sales survivor indices more than 110% of the US concentration. Except for North Carolina, the same states report very high percentages of project areas with indices more than 120% of the national level. (By “high” in this sense, we mean well above the project sample area average, which was itself quite elevated, as discussed above.)

Table 6.6 Project Areas by State: Sales Class Concentrations					
	Project Areas in Sample pool	Sales (All Firms) Smallest Class > US Conc.		Sales (Survivors) Smallest Class > US Conc.	
		> 110%	> 120%	> 110%	> 120%
AL	8	2	0	3	1
GA	8	6	0	6	2
KY	17	6	1	5	3
MD	4	0	0	0	0
MS	9	2	0	8	3
NC	9	2	0	5	1
NY	3	0	0	2	1
OH	6	4	0	2	1
PA	8	0	0	4	2
SC	2	0	0	1	1
TN	8	4	0	5	3
VA	3	0	0	0	0
WV	6	1	0	2	1
Total	91	27	1	43	19

6.3 Entrepreneurial Activity

Entrepreneurial Activity is 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 indexed against U.S. results where U.S. equals 100.

Startup activity calculations are focused on area-based entrepreneurship only; newly developed branch operations were not included in the calculations. Firms identified as startups (reporting one year or less of activity) are compared to all firms in the area that report an age or years of business activity (approximately 70% of all firms).

Startup activity was measured in three different time series:

- 1998-1999 covering the period Jan 1998 through December 1999
- 2001-2002 covering the period Jan 2001 through December 2002
- 2003-2004 covering the period Jan 2003 through December 2004

For each time series, firms falling into the startup definition (reporting one year or less of activity) were identified in each quarter. The identified quarterly startups were tracked until the end of the end of the time series in which they fell (of the three above). Those startups that maintained operations through the end of that time series were then compared to the number of all firms in each project area for which an age could be identified. The resulting startup activity rate was then

compared to the US national startup activity rate for the same period, creating the two decimal Entrepreneurial Activity Index for the area, which is reported for each project area in detail in the appendices.

Table 6.7 Project Area Entrepreneurial Activity			
	1998-1999	2001-2002	2003-2004
US Startup Rate	13.3%	11.4%	10.8%
All Project Areas	11.3%	9.1%	8.7%
Project Area Index	0.85	0.80	0.81
> 110% US Average	11	5	8
> 100% US Average	16	7	10
< 100% US Average	75	84	81
< 80% US Average	35	72	60
< 50% US Average	3	12	15

The top portion of Table 6.7 displays raw startup rates and percentages for both the US and the aggregated 91 project areas involved in the study. The third row, "Project Area Index" uses the two decimal index to compare the startup activity rate in project areas to the US. In general, there is a lag in project areas of about 21%, dropping four points from the 1998-99 level.

In fact, even during the period of highest relative (and absolute) startup activity, the vast majority of projects areas lagged behind US entrepreneurial patterns. In 1998-99, only 16 areas reported startup rates at or above the US average, and that number dropped to 10 areas (only 11% of the total) by the end of 2004. Importantly, the average area levels were buoyed by five highly rated areas, including three in Georgia (Bartow, Barrow and Jackson counties) and one in Alabama (Madison and Jefferson counties).

Despite the average project activity rate of 0.81, almost two-thirds of all project areas report entrepreneurial activity rates that are less than 80% of the US average. This is an improvement from the 2001-2002 time series (72 project areas, or 79% of the sample scored below 80% of the US rate), but significantly worse than 1998-99, when only 35 of the project areas (38%) were at this level.

The number of project areas with the weakest entrepreneurial activity rates is also increasing. In 1998-99, only 3% of the project areas indicated startup activity less than 50% of the US average, but this group rose to twelve projects area in

the 2001-02 time series (13%) and to fifteen project areas (16% of the sample) in 2003-04.

The conclusion, carried over and reinforced from the prior evaluation, is that entrepreneurial activity is weak and requires additional, patient focus in order to stimulate ongoing activity and growth.

Obviously, the large increase in the number of project areas with deficient entrepreneurial activity rates translates into similar increases on a state-by-state basis. That increase in low-performing areas is particularly evident in Kentucky, Maryland, Mississippi, Ohio, Pennsylvania and West Virginia. All of those states reported very high increases (in the 2002-2004 time series) in the proportion of project areas with an Entrepreneurial Index less than 80% of the US level. All but Ohio also indicated high rates of increase in project areas with indices less than 50% of the US average. Every state project area reported less than 80% of the national startup activity level in Maryland, Mississippi, Pennsylvania and West Virginia. Over half of all project areas in Kentucky, Ohio and Pennsylvania reported less than 80% of national level activity in both 1998-99 and 2002-04 time series. Every project area in Pennsylvania reported below 80% in both analyses. Georgia and Tennessee showed slight decreases in the proportion of project areas reporting low entrepreneurial activity rates.

Table 6.8 Project Areas by State: Entrepreneurial Activity					
	Project Areas in Sample pool	1998-1999		2002-2004	
		Less than US Concentration < 80%	< 50%	Less than US Concentration < 80%	< 50%
AL	8	1	0	4	1
GA	8	1	0	0	0
KY	17	8	0	14	2
MD	4	0	0	4	0
MS	9	1	0	9	3
NC	9	3	0	4	0
NY	3	1	0	1	0
OH	6	4	1	5	0
PA	8	8	2	8	6
SC	2	0	0	0	0
TN	8	4	0	3	1
VA	3	1	0	2	0
WV	6	3	0	6	2
Total	91	35	3	60	15

It appears likely that areas reporting both low entrepreneurship indices and disproportionately high concentrations of low sales firms among the more mature business population (survivors) should be the focus of some particular concern.

(We are not concluding broad problems here, but suggesting a risk potential that warrants further review.) A filter was applied to indicate project areas reporting both a survivor sales class index of the lowest sales-level firms that is at least 10% above US norms and startup activity indices below the project area average of 0.81 (19% below US levels). Twenty-seven project areas (30% of the total) fit both of these criteria, which together suggest difficulty in new vitality and mature firm growth. Interestingly, only nine are classified as distressed by the ARC while two are at-risk and thirteen are listed as transitional. Three others are in mixed designation areas, of which two include at least one distressed county.

Table 6.9 Survivor Growth and Startup Concern Areas				
State	County	Survivor Low Sales Index >1.10	US 02-04 Startup Index <0.81	Distress Classification
AL	DeKalb	1.17	0.62	Transitional
GA	Union	1.23	0.80	Transitional
KY	Estill	1.40	0.73	Distressed
KY	Letcher	1.23	0.64	Distressed
KY	Breathitt	1.27	0.77	Distressed
KY	*	1.16	0.66	Multi w/ 1+ Distressed
KY	Bath, Rowan	1.11	0.66	Multi w/ No Distressed
MS	Tishomingo	1.20	0.77	At-Risk
MS	Monroe	1.23	0.56	At-Risk
MS	Webster	1.29	0.63	Distressed
MS	Noxubee	1.17	0.34	Distressed
MS	Winston	1.16	0.61	Distressed
MS	Kemper	1.44	0.23	Distressed
MS	**	1.14	0.63	Multi w/ 1+ Distressed
MS	Prentiss	1.10	0.39	Transitional
NC	Surry	1.16	0.54	Transitional
NC	Alleghany	1.21	0.64	Transitional
NC	Alexander	1.17	0.76	Transitional
NY	Schuyler	1.24	0.67	Transitional
OH	Athens	1.14	0.71	Distressed
PA	Greene	1.21	0.51	Transitional
PA	Sullivan	1.15	0.36	Transitional
PA	Schuylkill	1.12	0.43	Transitional
PA	Bedford	1.25	0.43	Transitional
TN	Marion	1.18	0.48	Transitional
WV	Mingo	1.11	0.53	Distressed
WV	Hardy	1.22	0.37	Transitional

* Bath, Breathitt, Carter, Clark, Clay, Elliott, Estill, Fleming, Floyd, Harlan, Jackson, Knott, Letcher, Lewis, Perry, Powell, Rowan

** Chickasaw, Choctaw, Clay, Lowndes, Monroe, Noxubee, Oktibbeha, Webster, Winston

Looking at Table 6.9 (previous page), it is clear that these areas of concern fall into certain state clusters, especially in Kentucky (5 of 17 project areas), North Carolina (3 of 9 project areas), Pennsylvania (4 of 8 project areas) and especially Mississippi (8 of 9 project areas). Other states, including Maryland, South Carolina and Virginia have no project areas that fit both these criteria of concern. It is unknown whether these (and other sub-regional) patterns apply to the general ARC county population.

Notes

[1] Raw data analyzed for this report is sourced from an array of the nation's private business databases, reporting agencies and government statistical sources. None of these raw data sources creates the final metrics reflected in the report. Census and other government data is used incidentally to inform and test projections for non-reporting firms.

7. Issues and Recommendations for Program Improvement

The core of this report is in the assessment of ARC investments relative to project outcomes. That investigation, including subjective discussions with stakeholders, also suggested a modest list of recommendations as a reflection on issues that arose from the evaluation of the 104 projects. These observations are not meant as a total assessment of the program, its priorities, or its delivery system.

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 distressed and at-risk areas, and stimulation of entrepreneurship,
- Identification of objectives and opportunities by local and district-level development entities within the Region; and
- State priorities and fiscal constraints.

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

* **Measured Outcomes Indicate Reasonable Investment Strategy**

All project classifications appeared to us to fall within reasonable and accepted job cost parameters using the ARC share calculation method (and certainly by the full credit method). In general, there is a clear efficiency to utilizing projects that serve multiple firms, as most except industrial site project are likely to do.

Costs associated with the development of incubators, whose primary service purpose is to nurture enterprises early in their formation, are undertaken with the understanding that the most meaningful job creation will come in later stages. For that reason, and because of the stark problems of entrepreneurship faced by large segment of the Region (below), the solid new job return on investment of incubators is specifically noted.

While the telecommunications projects in the sample pool appeared to be highly effective and popular among stakeholders (including among those who have not yet applied for any) the nature of these projects call for attention to meaningful ways to project and measure outcomes. This is a difficult process which would benefit from some intensive thought.

While the housing projects reviewed generally fulfilled their projections and, in several cases, triggered community revitalization beyond expectations, there are

no historic guidelines to assess housing costs (as there are for job creating economic development efforts, for example). The ARC appears not to have developed any guideline in-house, either. The classification would benefit from a housing cost policy which addresses issues such as per unit dollar guidelines, and inclusion and assessment of indirect (e.g., area business) impacts.

Projects Made Progress On Strategic Objectives

While statistical measures are important, progress on strategic objectives which address the weaknesses of the Region are at least as critical to the investment process. As Chapter 5 suggests, projects in the sample pool had real impact on their host communities, often far beyond (and sometimes in different directions) than originally anticipated. Specific job projections aside, the effect of the project pool overall on a range of strategic objectives important to the Region's future should not be minimized, including:

- Economic diversification stabilizing local economic conditions;
- Reuse of vacant or underutilized sites and consequent revitalization of surrounding neighborhoods;
- Support for traditional industries that continue to be the backbone of many project counties;
- Successful speculative development efforts;
- Enhancement of local work force development;
- Significant non-economic community revitalization impacts;
- Tangible progress in distressed counties.

Highly Favorable Perception of the ARC Program

The Region's administrative approach to the Program consciously 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. Project stakeholders consistently commented on the ease of working with the ARC, and several noted with approval the ARC's ability to invest in planning and feasibility studies necessary to subsequent projects. However, as discussed in more detail below, a disturbing number of project areas appeared to retain only partial information regarding project development or outcomes, a situation which will weaken the program if not remedied.

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, investments targeted for residential and speculative economic development (though less convincingly in this evaluation round) appear to have generally paid off.

Importantly, representatives of almost three-quarters of all projects in the sample pool (and 76% of all economic development projects) expressed the opinion that their specific projects would not have been undertaken or completed without ARC participation. This widespread assessment indicates a valued and discerning eye for critical project investments by ARC staff.

File-Keeping Protocols Would Benefit From Attention

Through the interview process, there were indications that project files in several areas had not received the preliminary or follow-up attention required to help ARC fully understand results of its investments. In most cases, these deficiencies were partial, although in several cases significant. Interviewees (who were identified as key regional or local project contacts) were sometimes bereft of information on projects or unable to locate files.

In all, we noted information deficiencies of varying levels in 35 projects (34%), including:

- 6 projects with limited or no original impact projections;
- 13 which could not confirm key budget information;
- 14 could not confirm the existence or volume of private investment resulting from the project;
- 9 which could not confirm job impacts; and
- Many which could not confirm wages or other job quality indicators resulting from the projects.

While one state (MS) appeared to have limited information on as many as five projects and several were unable to respond completely for three or four, there was no discernible geographic pattern among areas with deficient projects. There were three information-deficient projects in two different LDDs, but that is not to say that the LDDs themselves were the responsible record-keeping entity.

This is a complex situation: On the one hand, ARC is lauded by development professionals because it ties a minimum of administrative burden to its investments. On the other hand, it is clear that projection and outcome files must be kept if the ARC is to learn from its successes and disappointments. We strongly suggest that a file-keeping protocol which aligns with, and does not add to the requirements of, ARC's common funding partners, be developed and strictly applied.

It's also worth noting that the 2000 evaluation round made some related findings:

Data collection might be refined to include closeout 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.

In the meantime, the ARC has also identified this issue and has entered into discussions with other basic funding agencies to address it (through the venue of OMB and an interagency coordinating council). In light of limited resources and the unlikelihood of added incentives to grant recipients in the field, the simplest effective solution might simply involve follow-up from the ARC at project close-out in order to ascertain impacts to date.

Project Classification System Should Be Reviewed

At several points in the evaluation process, it became clear that project classifications were often ambiguous, to the extent that the designations themselves should be revisited.

Most common was the overlap between industrial site, industrial park and development-related water-sewer projects, which could themselves take place in the service of an industrial park or site (and were in some cases specific to them). In other situations, it was difficult to understand the decision to designate a project as an industrial park versus site; both appeared suitable, and the classifications appeared to be without apparent difference. One telecommunications project took place in an incubator, serving incubator clients, and could have been classified as either. Access road projects are, almost by definition, specifically related to large industrial site or park development efforts, and access road costs are often folded into projects that adopt those classifications.

In short, the categories without a difference might be merged, and differences in function that most likely affects outcomes (for example, re-use projects where costs might be higher and job development lower, but in the service of the additional virtue of blight reduction) might be considered as new designations.

Consider Expanding Telecommunications Investments and Focus on Traded Services

As noted in Chapter 6 of the report, 64% of all project areas report communications sector sales concentrations (area based firms) that are less than 50% of the US average. This sector is apparently struggling and, in view of its national growth numbers, provides an opportunity for ARC districts.

While Chapter 6 also notes progress in the broad (often lower-value) services sector in project areas, the communications data suggest that traded services continue to lag significantly throughout the region, as we originally pointed out in the 2000 evaluation round:

In the same (1990-2000) 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 (the desirability of) increased attention to development of traded services and projects targeting their development.

This is an important area for strategic focus; as manufacturing declines across the economy, value-added traded services (that is, services which are likely to bring in dollars from outside the area in which a company is located) become critical value-added generators for the local economy. And it is in these services, in particular, that project areas and, we project, the Region, is weak.

In support of this notion, we found that 75% of all project areas reported sales concentrations of area-based Financial Services and related firms at least 20% below national levels. The jointly lagging communications and financial services industries suggest that the regional lag in traded services has, if anything, deepened.

That prelude underscores the need expressed by a variety of stakeholders for rural broadband access and additional telecommunications investment by the ARC. This envisioned future project focus was at least as pervasive as expressions of interest regarding more traditional infrastructure needs. It is particularly noteworthy that in one telecommunications project area, the ARC investment was credited with the success of a local incubator, including the repatriation of a local business which had previously relocated to an urban area with broadband access.

In addition, investments targeted toward area-based firms in these sectors would help balance local economies and strengthen the region in the country's two highest growth sectors.

Consider Simultaneous Telecommunications and Bricks-and-Mortar Investments in Single Sites

The frequent emphasis placed by project stakeholders on the impact of telecommunications enhancements for businesses in rural areas suggests that ARC consider simultaneous investments (bricks-and-mortar and telecommunications) at single sites. From urban locations with routine broadband and cable access, it's easy to forget the relative advantage of businesses in connected areas over those which are not so favored. The attraction of rural sites, and the added likelihood of success for businesses at those sites, is greatly enhanced by state-of the art telecommunication infrastructure. Investment in sites without that access will be increasingly hindered by the lack of high speed connections. On a case by case basis, ARC should consider enhancing the competitive advantage of its bricks and mortar investments with corollary telecommunications project investments as well.

This added focus would aid in general business development efforts, but in particular with new traded services initiatives, due to the disproportionately heavy reliance of traded services firms on cutting edge connections.

Consider Retention Growth Investments

Because we think what we have to say about the growth problems of mature firms could be significant, we've decided to briefly review that Chapter 6 discussion here.

Here's what we did: We took the universe in each project area in 1998, and tracked those firms (and only those firms for this analysis) through 2004. We did the same thing for all identified firms doing business throughout the US in 1998. The firms that we began tracking in 1998 and that were still in business in 2004 we refer to here as "mature" or "survivor" firms.

Then we looked at the growth patterns of the groups of mature firms. We found that the mature firms in Appalachian areas we reviewed grew less than the national rate of that peer group (using annual reported sales as a benchmark). We also found that, in an uncomfortable number of cases, the proportion of mature firms in Appalachian areas which fell into very small sales classes actually increased over time. Moreover, we saw (from the separate entrepreneurial activity analysis) that many Appalachian areas coupled the "mature firm growth" problems with sluggish entrepreneurial activity.

Here are the details:

Nineteen of 70 project areas reported very small sales category survivor (mature) firm concentrations that were at least 120% of the US average. This means that higher proportions of mature firms in project areas have fallen behind relative to their peers at the national level. This stark concern suggests added project focus on retention and growth assistance to existing firms, with the awareness that assistance should be reviewed for viability of the candidate firms, especially given some of the ARC's recent experience with traditional firm projects (e.g., Mountain City Sewer, Hammondsport Access Road).

Areas reporting both low entrepreneurship indices and disproportionately high concentrations of low sales firms among the more mature business population (survivors) should be the focus of some particular concern. Twenty-seven project areas indicate both a survivor sales class index of the lowest sales-level firms that is at least 10% above US norms and startup activity indices below the project area average of 0.81 (19% below US levels).

At least 30% of all project areas showed small sales survivor concentrations at least 110% of the US level and startup activity indices 20% below US levels. That finding calls for a review of concerns in such areas and the development of the programmatic efforts aimed at the growth of mature regional firms.

Consider Expanding Investments in Entrepreneurship

As detailed in the Section 6 Economic Vitality Analysis, entrepreneurship lags extensively throughout the sample pool. This is the case in the current evaluation round as it was in the last. Some progress has been made in some locations, there are further declines in others, but the conclusion is inescapable; the Region's distressed, at-risk and transitional areas appear to bear the burden of sluggish long-term entrepreneurial activity.

Second -- the good news -- is that focused efforts to address this problem work. Incubators were among the most successful projects in this evaluation, as they were in the 2000 evaluation round. Incubators sustain new businesses, help create jobs -- and appear to retain the firms and jobs they create in the areas served.

Once again, ARC dollars targeted at incubators (new and expansions) paid off. Once again, representatives of incubator projects expressed the need for ongoing operational and technical assistance.

Additional investment with entrepreneurial targets -- incubator and technical assistance -- is highly recommended for consideration.

In the 2000 evaluation round, we noted the value of follow-up technical and operational assistance to various projects, but especially incubators:

Certain valuable projects, often in remote and distressed counties, 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.

While we found incubators that were on sure economic footing this time around, there were others that --despite strong tenancy records -- had been forced to cut staff and/or services. In addition to broader incubator efforts, we continue to believe that follow-up assistance -- whether emanated by the ARC or state entities -- is a critical piece of the ongoing struggle to enhance entrepreneurial activity and success in Appalachia.

Other Prior Concerns

At least three other recommendations that were noted in the earlier (2000) evaluation round did not surface in any of the project sample reviews this time, which is in itself worth noting:

- In 2000 we noted that:

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 have progressed from distress status as a whole, but retain significant distressed portions.

ARC has since developed a "pocket of distress" policy which was implemented in 2002. The fact that the abandonment of distressed pockets in otherwise thriving counties was not raised by a single stakeholder this time around is in itself an indicator of some success.

- We also suggested in 2000 that "project buy-in should probably include commitments from non-recipient agencies (e.g., area zoning commissions) in a position to influence project outcomes", largely in an effort to avoid sprawl consequences from projects. With the exception of traffic issues in a competitive county with a large and hugely successful technology park (Huntsville, AL), sprawl did not arise as an issue in our discussions with stakeholders this time. We are informed by ARC staff, however, that it remains a concern in areas that are close to competitive or attainment counties (e.g. North GA, eastern panhandle of WV).

- Finally, as the result of repeated concerns expressed by stakeholders, we asked this question at the end of the 2000 evaluation round:

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.

Again, despite the border proximity of some projects, this issue arose in only one discussion this time -- and that was from a stakeholder eyeing commerce from across state lines that could be captured as a result of the project under review. ARC staff suggests that the pirating issue still exists, but may simply not have been prominent in the sample pool. We bow to the Commission's expertise and experience.

Appendix A: Site Visit Narratives

Site visits were made to eight projects in six 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:

- Ohio University Innovation Center (Athens, OH)
- Garrett Information Enterprise Center (McHenry, MD)
- Garrett Industrial Park - drive-by only (Accident, MD)
- Fay-Penn Business Center Over-run (Uniontown, PA)
- Keystone Opportunity Zones Site Development Plans (Fayette County, PA)
- Irvine Downtown Housing (Irvine, KY)
- Johnson City Utility Line Relocation (Johnson City, TN)
- Mountain Empire Regional Business Incubator (Wise, VA)
- Morehead 801 Industrial Park Water Storage Tank (Morehead, KY)

Individual write-ups follow.

*** Ohio University Innovation Center (Athens, OH)**

Situated in the midst of distressed Athens County, the Innovation is a sparkling center of creative economic activity in a lovely setting. The Center has supported over 150 jobs and two dozen new businesses. Current tenants are focused on several high-tech enterprises, outsourcing an estimated \$500,000 annually to other county businesses.

The nine current incubator enterprises include management and utility and environmental consultants, electronic workforce development services, cell-based diagnostics and therapeutic product development, online print development and distribution services, IT services and solar energy. At least four additional firms (computer network management, engineering software, electronic print design and drug discovery) reside off-site but receive substantial incubator services. Entrepreneurs emanate about 50% from Ohio University faculty, and 50% from the community. (There is better experience in retaining community-based entrepreneurs in the area.)



Façade of the Ohio University Innovation Center

There are also two longer-term anchor tenants (one a biomedical spin-off enterprise from university faculty) and nine firms receiving full incubator services. The other anchor tenant is the IT Alliance of Appalachian Ohio (ITAAO), the lead southeast Ohio organization for the information technology community.

Now in its third physical facility, the incubator boasts a 76% graduation rate with a three-to-four-year maximum tenancy (outside of the anchor tenants). Due to expansion, one anchor tenant is currently looking for space outside the Innovation Center. Pressure from Innovation Center tenants has produced the first moves toward private commercial land development in the county in several years. In the past, two graduating tenants developed their own buildings in order to move out. The University has invested in two companies in the Innovation Center complex.



Parking Lot of the Ohio University Innovation Center

The Center Director, Linda Clark, asserts that the Center has helped diversify the county economy away from historic timber, government and retail dependencies, bringing a much higher quality of forward looking jobs to the area. For the first time, the Center has allowed Athens to host national businesses, including FamilyWorks software and Diagnostic Hybrids, both of which have been served by the Center in different capacities.

The Center also helped attract venture capital, which was absent from the region, and reduced the level of regional parochialism by creating an informal working partnership between the university, the county, the city and the Chamber to find, service, graduate and relocate new businesses.

The Center has experienced staff cuts, but is largely self-sufficient. Some staff work is supplied by students (who also work with selected firms). The IT Alliance

manages an internship program, reimbursing technology companies up to three thousand dollars for intern costs.

Physically, the Innovation Center is a well designed, inviting facility, beautifully lit with much natural light and warm wooden panels. The building also benefits from solar efficiency, and social exchange between tenant companies and employees seems friendly and natural in the soaring entry foyer and common kitchen and conference areas.

*** Garrett Information Enterprise Center (McHenry, MD)**

Like the university area in Athens, the town of McHenry appears more vital and upscale than the rest of Garrett County. Situated at one end of Garrett College, up the hill from a built-up but tidy and attractive recreational waterfront and downhill from the overlooking ski area, the Garrett Information Enterprise Center (GIEC) is a nicely proportioned low building with thirteen current incubator tenants. ARC investment helped create the GIEC as a regional telecommunications powerhouse, with what is one of the few T-1 lines in the area.

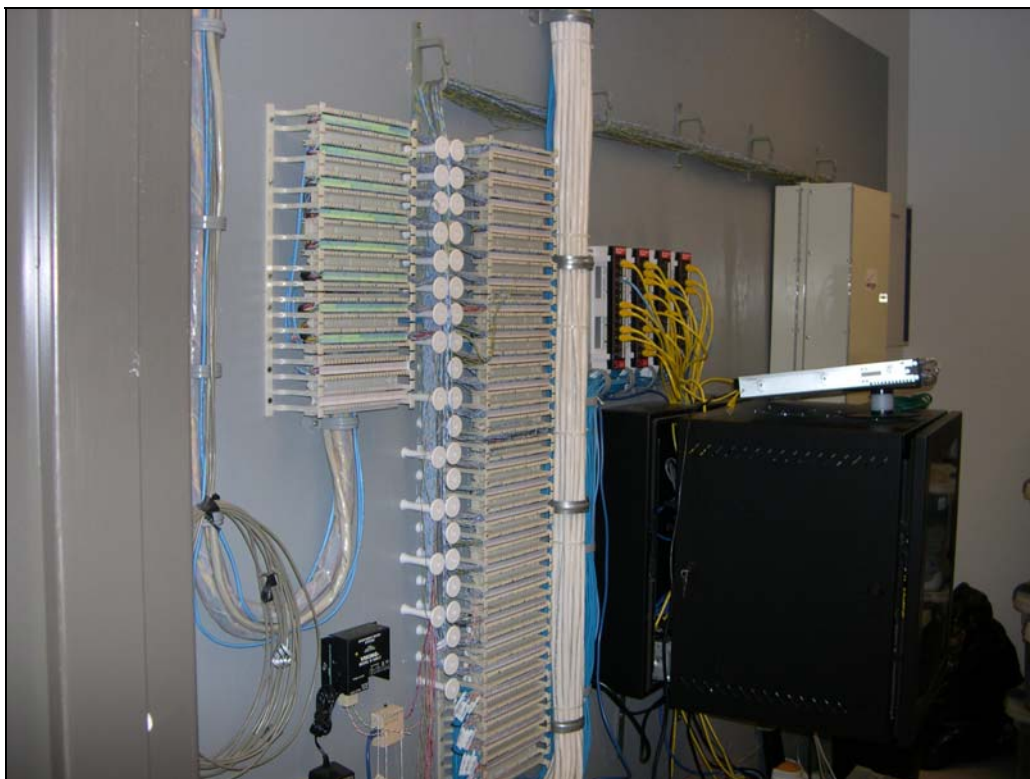


Entryway to the Garret Information Enterprise Center

Part-time Director Lydia Reiser is clear that the T-1 line is the reason for the success of the GIEC, and the most critical locational factor for its tenants. In fact, Reiser tells of one tenant (an international insurance reseller software developer) who left the incubator for Frederick MD due to the lack of a high-speed connection, only to return after installation of the T-1 line.

The thirteen tenants are an eclectic but technology-driven bunch, from the local publications to the offices of an electronically -modulated whitewater sports center, marketing firms, business supply services, utility consultants, graphic design and IT. The mix of service companies at GIEC has increased the diversity of the area economy and complemented development efforts by other organizations geared toward industrial land development. It has also served to

create an additional value-added economic leg that lessens the county's reliance on lower-paying tourism jobs.



High Speed Connection Center - Garret Information Enterprise Center

The GIEC is “almost self-sufficient” but struggling with one part-time staff person. The incubator no longer provides consulting and planning advice, but offers a full complement of physical services (including the T-1 line, janitorial, copying, common conference and eating areas) in a beautiful setting for under \$11/sq. ft. (Suites are available from 300-1250 sq. ft.) Due to financial constraints, the GIEC does not stipulate a maximum tenancy period. The director pointed out that a large growth challenge for incubator tenants is workforce development, including training of technologically adept employees. The GIEC relationship to Garrett College is invaluable in this regard and continues to develop.

The GIEC has clearly had marked success in a somewhat limited environment. The more significant access to academic staff, spin-off and resultant technology entrepreneurship at the Ohio University facility is obvious. But within those built-in constraints, the GIEC incubator is doing a job that needs to be done.

The bottom line advantage for the emerging businesses at the GIEC is the unique T-1 line asset, for which ARC provided the only federal investment.



Central Garrett Industrial Park Overview

Although it was not developed as a formal site visit, a stop at the Central Garret Industrial Park up the road in Accident, MD suggested progress on the industrial front as well.



Central Garrett Industrial Park - Phenix Technologies Entry

The park includes three anchor tenants, including a large machine shop, a container systems manufacturer and an international manufacturer of electric motor test, insulation test, high current, voltage, iron core loss and other test equipment. ARC's substantial investment in site development projects here is clearly part of the current progress and future anticipated growth on the site.



Central Garrett Industrial Park - Marketable Lot

The park's largest tenant has moved from a building which is currently being marketed to a larger, modern site across the road. The ARC investment in additional lot development offers the park a menu of options to market to firms seeking a location an easy drive from both east-west and north-south interstate connections.

*** Fay-Penn Business Center Over-run (Uniontown, PA)**

One of the remarkable things about the site visit undertaken in Fayette County has little to do with the actual projects at hand. Uniontown itself, the county seat, has undergone an astonishing transformation in the past few years, in part under the sponsorship of the Fay-Penn Economic Development Council, the recipient organization of ARC investments in both a local multi-tenant building and a separate site planning grant within the project pool. From a prior state which could be characterized as depressed and bedraggled, downtown Uniontown now sparkles with a beautifully restored theatre, refurbished office buildings, new retail outlets and a wonderful little plaza perfect for reading or napping on a warm day. (The visiting consultant was pleasantly astonished at the transformation.)

In this round, ARC investments were given over to less glamorous but critical nuts and bolts projects that may cement the county's progress, which is already evidenced in its elevation from pre-project distressed to current at-risk status.



Fay-Penn Business Center Frontage

The Fay-Penn Business Center Improvement Over-run project (a multi-tenant building misclassified in ARC files as an incubator) sits on state route 119 across from the local Penn State University campus. The east side of the strip is home to the Center and a variety of other large and small industrial properties, most busily engaged in various manufacturing processes.

The Business Center currently supports four tenants and 93 industrial jobs, 78 of them directly resulting from the ARC investment in rehabilitating this former plastics molding facility purchased at sheriff's sale. In addition to clearing out old utility infrastructure and cleaning, the project improved interior areas badly damaged by water leakage and installed new metal roofing throughout. Manufacturing space was improved and parking areas resurfaced. The impression of the facility is of a newer, clean and efficient space being productively used.



Fay-Penn Business Center Working Rear

Although weather and topography prevented an actual survey of sites in their initial implementation stages, Fay-Penn representatives also reported on progress stemming from an ARC investment in development plans for three different industrial sites in the county: the Springhill site near route 119 North in North Union Township (a former strip mining operation two miles from the PA Turnpike and five from I-68); the Keystone Opportunity Zone Brownfield site near route 199 and the Mon-Fayette expressway with on-site rail access; and the Lamont Furnace site near 199 and SR 40, also with existing rail access. All three sites are along the Pittsburgh-Charleston, WV corridor and well positioned to take advantage of markets and industrial activity in the tri-state (PA-WV-MD) region. The Lamont Furnace site has, even at this early stage of development, attracted “significant heavy industry interest” according to Fay-Penn representatives during review of the site plans.

* Johnson City Utility Line Relocation (Johnson City, TN)

The Johnson City Utility Line Relocation project is a good example of how the numbers don't always tell the whole story. The project (a utility line relocation) reads like a solid expansion assistance investment with good return numbers (250 new jobs). But the site visit revealed a model of agency and private sector cooperation and a much larger impact than the file report indicated.

The project invested in infrastructure that permitted the expansion of American Water Heater, Johnson City's largest manufacturer, to expand its existing in-town facility. 150,000 square feet of industrial space was added to the existing 350,000 sq. foot plant, helping to increase local production from 5100 to 8300 units per day, and is currently rated as the most efficient hot water heater plant in the world. Since then, the company has continued to purchase adjacent, abandoned industrial property (11 acres) and plans yet another expansion. Yet another abandoned industrial building (a former Burlington factory) has been purchased and converted to warehouse use by the company.



American Water Heater- Johnson City

However, expansion only tells part of the story. As an American Water Heater representative said emphatically at the site visit, "the project actually kept the company in Johnson City". Without the expansion, which was critical for company efficiency, the company would have relocated outside the city, impacting the 850 workers employed before the expansion. Neither the impacts

in the report narrative nor any file material indicate these 850 retained jobs. The company utilizes a base of about fifty local suppliers for goods and services and has worked regularly with the North East TN training board to assure workforce development. (The company designates skills and designs the programs, which are then delivered by the non-profit agency.)

In addition, the project overcame significant concerns to expand the plant and maintain positive working relationships with the surrounding community. The expansion design could only be accomplished by closing one of the major streets in the neighborhood, which itself engendered significant change for the community. Traditional concerns regarding property values near an industrial facility were also voiced, both publicly and privately, despite the motivation of retained and expanded manufacturing jobs. (Sixty-seven per cent of the company's workforce comes from the home county, Washington.)



Recreational Improvements- Johnson City

At the end of the day, the concerns were overcome. The city and company invested time and money to assure a well-masked site and a series of traffic improvements (including a series of speed bumps and the area's first traffic roundabouts) that have actually improved the neighborhood. City and development officials indicate that the area housing stock has improved since the project and, in fact, mere steps away the neighborhood appears serene and quite middle class. The company runs 24-hour security around the plant and through the neighborhood, enhancing residential security as well. There is no apparent

noise from the manufacturing site, which is set back and well screened from the street. Truck traffic is carefully routed, and a new recreational area, including a softball field, playground and picnic pavilion, has been carved out. Wherever possible (as at an abandoned school's parking lot) older, unused properties have been incorporated into the contiguous industrial facility. In all, the project extends for nine city blocks, with warehouse space covering the area of the closed former street.



Expansion Neighborhood Screening- Johnson City

Today, American Water Heater is the only one of the three major manufacturers in its field without a manufacturing facility in Mexico.

* Mountain Empire Regional Business Incubator (Wise, VA)

The Mountain Empire Regional Business Incubator (serving Lee, Scott and Wise counties in VA) is a large, low building originally constructed as a locally-owned discount goods store - “like a mom and pop Sam’s Club” which was vacant for ten years before the incubator was developed, according to a local development official involved in the process. The incubator has experienced several ups-and-downs, and is currently anchored by both a call center with a noticeably young employee pool, and a sheltered workshop which pays rent and provides maintenance services for the entire building. The ARC investment is critical to maintaining the operational balance of the incubator, which is valuable but precarious. A second, smaller satellite has recently opened in downtown Norton, which boasts two new tenants.



Pioneer Center Facade

Because of the remaining 3000 sq. feet of spaced in the building, tenure policies are more flexible than in most incubators. The area SBDC director is also the incubator manager, assuring the availability of tenant business counseling services.

The incubator is nicely put-together, but without the high-level design of the Ohio University Innovation Center in Ohio or even the Maryland’s Garret Enterprise Center Athens Ohio. The difference can also be felt in the tenant core, which is less high-tech and heavily populated with non-profit organizations which provide

much needed services, but whose essence is not, at heart, entrepreneurial. This is not really a criticism of the MERBI, but a perhaps only a comment on the struggle of rural incubators which are not graced with on-site college or university connections.



Pioneer Center Lobby

Nevertheless, the incubator has several interesting tenants, including repatriated entrepreneurs who had left the area for larger environs, and a developer of child filter software who had moved into the facility because of its high-speed connections (and then outgrew them and installed its own T-1 line). The same entrepreneur has since branched out (in the incubator) and established a second entity into the field of fiber optic installation. At least one other incubator tenant (who refurbishes and sells vintage arcade games and parts) has also used the incubator as a base for addition lines of business (in this case, rehabilitating old movie theaters in the areas, with current plans for a new multiplex as well).

Economic development officials fully understand the frustrations of breathing life into incubators in these situations, but the value is clear to them, both from the local services provided by tenants and the less frequent but real breakthrough tenants who bring new dollars into struggling areas such as Wise, Lee and Scott counties.

*** Morehead 801 Industrial Park Water Storage Tank (Morehead, KY)**

The Morehead (KY) 801 Industrial Park may be the only site around with a rustic but beautifully updated log cabin office on a pastoral pond, acres of (disappearing) rolling pasture land and hundreds of high-level manufacturing jobs. The park's home in Rowan County, Kentucky has progressed from distressed to transitional status and, from the activity around the park, through Morehead's commercial district and from the discussion with the local development chief, the trajectory seems to be continuing upward.



Morehead 801 Industrial Park Water Tank

From the road, the industrial park's most notable feature and landmark is an enormous water tower, the object of ARC investment in this project from the sample pool. The tank's 400,000 gallon capacity fueled the growth of a 450-employee Family Dollar distribution complex which "wouldn't be here without it" according to local stakeholders. The tank also serves the nearby Ellington industrial complex, which is in the process of selling 10 of its 65 acres. On the far side of the Ellington complex, implementation is about to begin on the construction of a regional airport serving private and charter flights. A near-term Announcement of a Wal-Mart Supercenter, will likely be made before this report is published.

The capabilities of the park provide a buffer against downturns beyond local control. The sudden and unexpected closure of a large, absentee-owned apparel manufacturer (with less than 24-hours notice) surprised even the local plant manager. But months later, the Morehead-Rowan County EDC is about to close a deal to give new life to the plant, converting it into a multi-tenant building which will start by housing multiple businesses owned by the same local entrepreneur.



Morehead 801 Industrial Park

Although utilizing the remainder of the space as an incubator has some appeal, the EDC is considering the development of a new incubator building, a prospect that will be given a potential boost with the inauguration of a Morehead State University robotics and industrial education program within the industrial park, as well as a 35-acre campus of the Community Technical College (planned for 2008), doubling the size of the college's current downtown facility. In addition to existing high-speed connections at the park, the EDC is about to sell two acres to a new company that will provide high-speed wireless setups to park tenants and the community at large.



Morehead 801 Industrial Park Log Cabin Office

The unique lay-out of the industrial park make it the perfect site for the impressive combination of local entrepreneurship (like the expanding machine shop), large scale manufacturing, technology services, education, workforce development and economic development administration, a potential which appeared on the site visit to be handled admirably by local development efforts.

*** Irvine Downtown Housing (Irvine, KY)**

All evidence is gone of the gas explosion which ripped off the backside of several downtown buildings in Irvine, KY. In its place, Irvine boasts the Renaissance Apartments, a complex of fully occupied 30 independent living units for low-income elderly. Most of the residents are from Irvine itself, and, with rents of \$303 (and actual payments after subsidies in the \$120-\$130 range) in a place that they can stay for the rest of their lives.



Renaissance Apartments Facade

The façade of the apartment complex is graciously designed, and a set of older men sits on the front patio, conversing the early autumn sun. It's a far cry from the "before" photos hanging on the wall of the bright, comfortable lobby. In them, the back of the building is completely exposed, with debris and possessions strewn about, looking exactly like what it was -- the aftermath of a destructive explosion that destroyed all but the shell of the (now connected) buildings.

The struggling downtown area around the apartments has received a significant boost from the complex and the ARC investment in it - new gift, framing, arts and crafts shops and a luncheonette have opened, benefiting from not only the resident shopping but visiting families out for a stroll on the main street and into the shops. The area's community development director estimates incremental spending impacts at \$600,000.

The units themselves are small but comfortable, with stylish restored brick accents, providing well for the needs of the single, almost all elderly residents. While the living is independent, the staff at the complex works closely with health care providers to coordinate services and notify providers when they are needed.



Renaissance Apartments - Typical Unit

As staff members noted throughout our tour and interview process, some of the current residents were brought in from cars serving as homes, and one moved into the facility from a make-shift shelter “under the bridge” into town. As one of only two elderly housing complexes in the entire county, the need was obvious, and so are the results.

Appendix B: Methodology: Project Selection

The 104 projects analyzed for this report were selected from files representing 394 closed projects with ARC investments in the Infrastructure and Public Works Program between 2000 and 2006. 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 an array of projects in twenty-four different categories:

For the purposes of this evaluation, especially given the limited number of projects which would be evaluated, these aggregated into fifteen categories, of which seven were used in the actual selection process, with a focus on economic development-related categories and the new housing and telecommunications classifications. These seven classifications were selected for the types of outcomes suggested by their classifications, as well as a desire on ARC's part to include new project areas like housing and telecommunications in the investment evaluation process. The number of projects in a classification also played a part, since any category with too few projects could not be subjected to a reasonable scale of evaluation.

Table B.1 Closed ARC Projects- Selection Pool	
Project Classification	Closed Projects
Access Road **	5
Business Incubator **	7
Community Facility	9
Downtown Revitalization	7
Energy	1
Environmental-Solid Waste	2
Flood Related	5
Gas Line	7
Housing Development **	32
Industrial Park Development **	35
Industrial Site Development	25
Technical Assistance	9
Telecommunications **	15
Telemedicine	1
Water-Sewer **	234
Total	394
** utilized for project pool evaluations	

It was determined early on to avoid a strict final selection of projects by their proportion in the closed project universe; otherwise, the evaluation would be almost completely dominated by water-sewer projects (two-thirds of the narrowed project total). The original number of water-sewer projects was pared down to focus on economic-development-related projects (32 of them, eventually) 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 posed difficult evaluation problems and increased the complexity and cost of the research (e.g., solid waste projects and public safety). We also excluded the odds and ends (such as technical planning grants and a gas line). In the end, the seven aggregated and selected categories encompassed 353 projects, from which the final sample pool of 104 was selected.

Since it was considered by both ARC and the consultant team to review enough projects in conceptually important categories to evaluate the category as well as individual projects, higher proportions were identified for a number of economic development classifications and telecommunications (some of which had important economic development impacts as well). The percentage of housing projects eventually selected was less than the category's proportion in the closed project pool, but this was considered a balance between the desire to evaluate this new project classification against the geographical concentration and non-economic development focus of all of the projects in it.

The process of narrowing the group of 353 projects to the target of 100 projects (eventually 104) included the following steps:

- * To the extent possible, water and sewer projects that envisioned economic development impacts received priority. Thirty-two of the fifty-one water and sewer projects evaluated projected economic development outcomes.
- * Attempts were made to ensure enough representation from all project classifications to ensure a robust assessment of each type.

Of the total of 104 projects analyzed, 77 reflected objectives and outcomes directly related to economic development, while the remainder were residential water-sewer, housing or telecommunications projects that related to quality-of-life objectives. Thirty-two 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 104 utilized projects were distributed in these classifications:

- * 51 water-sewer projects

- * 21 industrial parks
- * 12 Industrial sites
- * 5 business incubators
- * 3 access roads
- * 8 telecommunications
- * 4 housing

* Efforts were made to ensure geographical representation from all states in the ARC Region. This resulted in the following distribution:

- * Alabama: 9
- * Georgia: 8
- * Kentucky: 19
- * Maryland: 6
- * Mississippi: 9
- * North Carolina: 9
- * New York: 5
- * Ohio: 7
- * South Carolina: 2
- * Tennessee: 11
- * Virginia: 3
- * West Virginia: 6

While the high number of Kentucky projects included is due to a variety of factors, including project mix and distress designations, it should be noted that Kentucky also sponsored all 34 of the housing projects in the original pool, and that as all four housing projects selected for review were naturally also Kentucky projects, weighting the sample.

* Efforts were made to assure representative distribution among rural and metropolitan areas. In the final sample pool, 74% of all projects were located in either rural or mixed metro-rural areas, while in the region overall, the percentage of rural counties is 73%.

* Efforts were made to assure representative distribution among distressed counties. Distress selection is discussed separately in Appendix E.

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 many. Each of the counties in which projects were

developed was subjected to a variety of economic trend, vitality, and impact measurements.

More detailed information on project selection and categories is available in Section 2 of the report.

Appendix C. Methodology: Impact Analysis

This study documents how individual and entire sets of projects supported by ARC affected local economic activity, including changes in local land development, private investment, mix of business and jobs, and levels of taxes. The analysis was accomplished by reviewing project data collected on-site by ARC at the time of application and the time of project closeout and case study interviews (covering local private sector and public sector participants and observers), together with available local documents and economic data. The objectives of this analysis are to provide insight into the causal effects of projects, and to determine how project implementation actually interacted with other local economic activities and economic development efforts to affect local communities.

The analysis is most useful for evaluating program performance and identifying how it might be improved in the future. It reports actual observed results, as opposed to estimating how local economies might have changed under hypothetical situations.

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 direct consequences of the public investment, project, or program. Direct economic effects are 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. Indirect economic effects 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 that are a consequence of the change in workers and payroll of directly and indirectly affected businesses.

“Direct effects” are measured through monitoring program outcomes and through local site interviews. The “indirect” and “induced” business impacts are often referred to as “multiplier effects.” These multiplier effects are established through interviews of observed impacts and are also estimated through input-output (I-O) economic models that are calibrated for each local county. I-O models

incorporate inter-industry purchase and sales patterns (reflecting prevailing industry structures and technologies) and estimates of the extent to which local suppliers provide various products and services. As such, impacts calculated from models tend to be higher in counties that have stronger economies and are populated with local establishments capable of supplying other businesses and meeting local consumer demand. For projects in counties with poorly developed economies, more business-to-business sales and consumer spending “leak” out of local areas than for counties with more strongly developed economies.

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”). IMPLAN 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 509 industries and is based on categories of the BEA that correspond to four to six-digit groups in the North American Industrial Classification System (NAICS).

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 NAICS groups based on information from interviews with local public and private sector representatives. The IMPLAN model was then calibrated for each county and run given the direct effects on specific NAICS groups in each of those counties. For multi-county projects, multi-county models were constructed. The result was an estimate of the indirect and induced (and overall) job and income impacts for each project on its own local county.

ARC owned IMPLAN models for each of the 410 Appalachian counties based on the 2000 economy. After discussions between the Project Team and

Commission staff, it was decided not to incur the expense of purchasing a new set of county models. Instead, county-specific multipliers were adjusted based on changes in county economies between the years 2000 and 2004, using the following techniques:

1. Construct county specific 1-digit multipliers from 2000 IMPLAN data set in hand (employment, wages and sales [output] for manufacturing, Transportation, Construction and Utilities; Services or Trade, depending on the project).
2. Using U.S. County Business Patterns, establish location quotients for the years 2000 and 2004 (most recent available) of county to state for applicable sectors.
 - a. Calculate percent of sector employment in county in each year;
 - b. Calculate percent of sector employment in state in each year; and
 - c. Divide county percent by state percent in each year, for a Location Quotient (LQ).
3. Divide the LQ 2004 by the LQ 2000 to calculate the change in Location Quotient between 2000 and 2004.
4. Multiply the factor calculated in Step 3 (above) by the 2000 multiplier (see Step 1) to approximate an updated multiplier.

Below, this approach is illustrated using the example of an Industrial Park project in Bartow County, Georgia.

Step 1 → Identify County, State, Project and Appropriate Multiplier (indirect plus induced effects)

State:	Georgia
County:	Bartow
Project	Bartow County Industrial Park
Bartow County 2000 MFG Multiplier for Employment Derived from IMPLAN	2.33

Step 2 → Calculate County's Share of Appropriate Economic Sector in State Economies, 2000 and 2004.

	Years	2000	2004	Source
Georgia MFG Employment		518,063	432,512	County Business Patterns
Georgia Total Employment		3,483,500	3,452,451	County Business Patterns
Percent Manufacturing		14.87%	12.53%	
Bartow County MFG Employment		9174	8336	County Business Patterns
Bartow County Total Employment		26550	28216	County Business Patterns
Percent Manufacturing		34.55%	29.54%	

Steps 3 & 4 → Calculate Location Quotients within State for Appropriate Sectors for Counties in 2000 and 2004 and Calculate the Change in the LQ's. Apply the Change to the Appropriate 2000 Multiplier from Step 1.

MFG Location Quotient Bartow/Georgia	2.32	2.36
Change in L/Q,2000-2004 (LQ 2004/LQ2000)		1.015
Estimated updated MFG employment multiplier (2000 MFG Multiplier x change in L/Q)		2.36

This methodology was used for every project with the exception of two that involved federal prison jobs. These projects were in Martin County and McCreary County in Kentucky. As County Business Patterns data does not track for government jobs, BEA data were used for these projects to find the amount of employment. However, when applying the multiplier and location quotient change, the multipliers were way too high to be credible because the scale of job increase created an abnormally large LQ change. Therefore, the project team used the most recent county level IMPLAN data in its procession for Appalachian states where there are federal prisons to develop county multiplier effects created by these two projects.

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 information was compared with the BEA data on total personal income by state; 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; 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 if applicable) on the germane 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 due to 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 payback from public investments. Such an approach is *not* appropriate here, for the following 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, not just to maximize "efficiency" in terms of national return on investment.

* Benefits. The projects funded by these programs are intended to represent not only 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 current *annual* impacts are 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 viewed as providing useful insight for improving program design and application in the future. It 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 assuming benefits not yet in place due to project delays or other obstacles.

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.

Appendix D: Methodology, Economic Vitality Analysis

Each segment of the economic vitality analysis was developed through a longitudinal analysis with the use of up to 28 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 - a “snapshot” taken at multiple points in time, as reflected in the Impact Area Diversification trends section of the project area thumbnail reports. These and other snapshots represent an important element of economic vitality analysis, but do not offer any way of understanding the experience of individual firms or groups of firms—how many survive, die, grow, or decline.

Longitudinal analysis fills this critical gap. The Sales Class Spread and Employment Class Spread methodology takes “snapshots” of the economy nationally and within each local project impact area for 1998 and 2004, then breaks out firms by sales class and establishments by employment class. Non-reporting firms are discarded. (This includes 4.2% of all establishments that do not report employment and 2.5% of all firms that do not report sales.) The 1998 sub-group is tracked over time to identify the changes in size class composition over time of the survivor members of the group. The result is the longitudinal “survivor” data in both the Sales Class Spread and Employment Class Spread data.

Entrepreneurial Activity, as measured by start-up rates across the United States and in each project area. Unduplicated firms reporting one year or less of operation were summed through the databases in two years increments. 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. This allowed a consistent startup activity benchmark, discarding data from unknown firms and comparing rates of startup activity in different periods. To reiterate, the two decimal index does not compare the startup rates of a given area at two different points in time, but rather, the US and local startups rates over the same time series. (The startup rates of a given area at two different points in time can also be reviewed on a percentage basis in the original data sheets, however.)

The national databases used for comparison is composed of information on over 25 million business establishments. So that the diverse measures included in the economic analysis can be easily digested, they are presented for each project impact area in an indexed format that compares the project area to the corresponding US average. In each case, the US average equals 1.00, and the relative measure for the project area is above or below 1.00 in the same

proportion. For example, a project area index of 1.10 indicates that the project area is 10% above the US average; if 0.90, it is 10% below.

The index indicates different measures, and “high” is not always “good”. In some cases, the index is simply intuitive – an entrepreneurial vitality index above 1.00 indicates that the project area startup rate is above US averages, and can generally be taken as a positive reflection of area vitality. In most cases, however, index measures used in this section (and in the corresponding project area-specific thumbnail reports in the appendices) simply indicate a proportion of firms in a sector, a sales category or an employment category that is lower or higher than the US concentration in the corresponding category. The meaning of the index in these cases is purely subjective. For example, a concentration of 1.20 in manufacturing employment (20% above national concentrations) could be positive or negative, depending on the situation and development objectives of the individual project area. In other words, the most meaningful interpretations are at the local level. Broader points that can be drawn (entrepreneurial vitality for example) are developed in this section, but the reader is encouraged to review the appendices for more detail and interpretation in each project area.

Where sales data is developed, it reflects only the reports of firms based in the project area. Sales attributable to branch operations are reported through headquarters, so branch operations based outside the project area will usually report local employment, but not local sales. This mechanism limits the full view of economic activity in an area (especially areas, such as some ARC counties, which significantly rely on “foreign” branch operations). Partly for this reason, business count and employment indices (which include all business establishments) are included in the diversification analyses. These different perspectives can also be read jointly as an indicator of reliance on operations based outside the project area. For example, if manufacturing employment and business count indices are significantly higher than 1.00, and the sales index is significantly below 1.00, it is a likely indication that branches are reporting high local employment levels but attributing sales elsewhere – in other words, that the area may be overly reliant on firms based outside the area.

The employment and sales class index also display area results which are relative to the spread of all US firms. While this spread will normally differ somewhat from the average, it’s worth noting that the most important differences may occur at the top and bottom of the scales, which indicate if an area is overly reliant on very small or very large firms. Of particular interest are the “survivor” patterns, which indicate the seven-year growth levels of firms which were in operation at the start of the time series (1998) and maintained operation through the end (first quarter of 2005). Areas in which survivor firms actually increased their index concentration of very small firms may need to add focus on growth assistance to mature local companies, since their “survivors”, as a group, indicate less growth vitality than the national average.

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 407 counties in the Appalachian Region, with each county assigned to one of five economic categories: distressed, at-risk 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 greater matching funds requirements rising for at-risk, transitional and competitive counties, 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 the 407 counties. Base year designations (FY2002) were compared with current year (FY2006).

Of the 410 counties in Appalachia as of 2002, 122 (30 percent) were distressed, 258 (63 percent) transitional, 18 (4 percent) competitive, and 12 (3 percent) attainment. By 2006, three counties that were designated as ARC counties in 2002 were excluded from the regional designation. Of the 407 counties defined in the Region in 2006, distress designations had decreased as a percentage of the whole, largely due to the creation of a new, fifth at-risk category that lay between distressed and transitional. As a result, the number of transitional counties diminished by 38, while the number of distressed counties was reduced by 45. An almost corresponding number of counties (83) fell into the new at-risk classification.

By contrast, among the 104 project impact areas, 44 (42 percent) were distressed or included distressed counties in 2002, and 52 (50 percent) were transitional. Five were competitive, and none were in the attainment category. In other words, the concentration of distress was significantly higher in project counties than in non-project areas. There were lower percentages of transitional counties than in the Region overall.

By FY2006, the distress concentration among project areas had dropped to 33%, compared to 19% of all ARC counties. Both projects are and Regional distress concentrations had lowered considerably, although project area progress still lagged behind the larger region.

Among the projects in the sample pool, four were in multi-county areas that progressed from including at least one distressed county to no distressed

counties. Eleven were in areas that moved up from distressed county status to at-risk status; and three from distressed to transitional status. That is, 17 of 45 projects which began in distressed counties (38%) moved to a higher status by 2006.

Table E.1 ARC Counties and Sample Pool Area Distress Classifications				
	Appalachian Region		Project Pool	
	2002	2006	2002	2006
Attainment	12	8	0	1
Competitive	18	21	5	3
Transitional	258	220	52	46
At-Risk		81		18
Distressed	122	77	36	26
Multi Cty. 1+ Distress			8	4
Multi Cty. No Distress			3	6
Total	410	407	104	104
	Appalachian Region		Project Pool	
	2002	2006	2002	2006
Attainment	3%	2%	0%	1%
Competitive	4%	5%	5%	3%
Transitional	63%	54%	50%	44%
At-Risk		20%		17%
Distressed	30%	19%	35%	25%
Multi Cty. 1+ Distress			8%	4%
Multi Cty. No Distress			3%	6%
Total	100%	100%	100%	100%

A separate analysis traced the progress of the most distressed ARC counties in both the non-project and project groups. Of the 122 ARC counties that were in the distressed category in 2002, 11 (9 percent) moved up to the transitional category by FY2006, while 35 (34%) progressed to the new at-risk classification. In total, 38% moved to a higher status by 2006, the same percentage as the sample pool.

Of course, there is not much of an immediate cause and effect argument that can be made, there being too many unknowns (among the project pool and all distressed ARC areas), including distressed counties outside the project pool which also received ARC and/or other investments, geographical and other considerations that may have had a profound impact on specific distressed counties, and other considerations.

Appendix F. Project List

ProjectID	State	County	StartYear	Project Name
13483	AL	DeKalb	1999	Fort Payne Distribution Center Utilities
11685	AL	Jefferson	1994	Bessemer Airport Water Main Extension, Revision
14207	AL	Colbert	2002	Reltoc Building Renovation
13369	AL	Talladega	1999	New Well & Distribution System
13144	AL	Madison	1998	Huntsville Infrastructure/Research Park
13028	AL	Blount	1999	County Line Industrial Park/Smoke Rise Sewer
12983	AL	Pickens	1998	Reform Water System Improvements
12942	AL	DeKalb	1998	Valley Head Sewer System
12660	AL	Lawrence	1997	Moulton Sewer Line Extension
13073	GA	Bartow	1998	Bartow County Industrial Park
13866	GA	Walker	2001	Rock Springs Industrial Park Improvements
13102	GA	Union	1998	Blairsville/Union County Industrial Park
13135	GA	Jackson	1998	Braselton Wastewater Expansion
13406	GA	Dawson	1999	Dawsonville Water System Improvements
13417	GA	Barrow	1999	Winder Sewer System Expansion
13418	GA	Madison	1999	Madison County Water System Improvements
14870	GA	Fannin	2004	Epworth Broadband Initiative
6302-C23/05	KY	Floyd	2002	Safe Harbor Transitional Housing (\$25,000)
6302-19-05-C20	KY	multiple	1998	Irvine Downtown Project
6302	KY	multiple	1997	Federation of Appalachian Housing Enterprises FAHE
11278	KY	Bath-Rowan	1993	Salt Lick Sewer Collection System
13084	KY	Pike	1998	Phelps/Buskirk Sanitary Sewer System
13125	KY	Breathitt	1998	Jackson Water Storage Tank Replacement
13136	KY	Letcher	1998	Jenkins Industrial Site Infrastructure
13138	KY	Rowan	1998	Morehead 801 Industrial Park Water Storage Tank
13163	KY	Knott	1998	Carrs Fork/Littcarr Water Extension
13192	KY	Whitley	1998	Whitley County Water
13201	KY	Martin-Floyd-Johns	1998	Paintsville/Honey Branch Wastewater
14611	KY	Breathitt	2003	Breathitt County/KY 30 Water Line, Phase I
6302	KY	Pulaski	1998	Clifty Heights Elderly Rental Housing
13987	KY	Bell	2001	Stoney Fork/Red Bird/Saylor Hollow Water, Overrun
13797	KY	McCreary	2000	McCreary County Prison Infrastructure
13630	KY	Lincoln	2000	McKinney Water Extension
13621	KY	Monroe	2000	Tompkinsville Industrial Park Development
13533	KY	Floyd	1999	David Wastewater Improvements
13358	KY	Adair	1999	Columbia/Adair County Industrial Park
13482	MD	Allegany	1999	Cumberland Rolling Mill Infrastructure
12932	MD	Allegany	1998	Allegany Business Center Engineering & Soil Feasibility
13162	MD	multiple	1998	Western MD Regional Video Switched Network
13385	MD	Allegany	1999	Upper Potomac River Commission Sewage Plant Upgrade
13762	MD	Garrett	2000	Central Garrett Industrial Park Improvements
13444	MD	Garrett	1999	Garrett Information Enterprise Center Equipment Project
13628	MS	multiple	2000	Golden Triangle Airport Radio Communications System
13002	MS	Lee	1998	Northeast MS Regional Water Supply Facilities Improvements
13001	MS	Noxubee	1998	Brooksville Sewer System Improvements
12467	MS	Winston	1996	Louisville/Winston County Access Road, Overrun
13424	MS	Tishomingo	1999	Tishomingo County Water District Study & Improvements
14187	MS	Monroe	2002	Monroe County Industrial Building

14191 MS	Prentiss	2002 Prentiss-Alcorn Water System Improvements
14383 MS	Kemper	2002 Kemper County Incubator Expansion
13160 MS	Webster	1998 Walthall Wastewater Treatment & Sewage Collection
12011 NC	Graham	1995 Robbinsville Sewer Line Extension
14197 NC	Surry	2002 Elkin Sewer Extension to I-77
14299 NC	Alleghany	2002 Blue Ridge Telecenter Development
14059 NC	Burke	2001 Icard Water Improvement
13862 NC	Alexander	2001 Taylorsville Industrial Water
13487 NC	Cherokee	1999 Andrews Wastewater Plant & System Improvements
13322 NC	Caldwell	1999 Billy Branch Sewer Line
13117 NC	Ashe	1998 Jefferson Water & Sewer Extension
14303 NC	multiple	2002 NC Mutual Endeavor to Connect Communities in Appalachia
13026 NY	Steuben	1998 Hammondsport Industrial Access Road
13384 NY	Chemung	1999 Big Flats Sewer System Improvements
14278 NY	Schuyler	2002 Watkins Glen Second Street Water/Sewer Upgrade
13053 NY	Chemung	1998 Prescott Avenue Industrial Access Road
14022 NY	Steuben	2001 Troupsburg Wastewater Collection & Treatment Plant
14002 OH	Athens	2003 Ohio University Innovation Center
13629 OH	Monroe	2000 Monroe Industrial Park Building
13566 OH	Hocking	2000 Logan-Hocking Industrial Park
13530 OH	Belmont	1999 Belmont County Fox Commerce Park
13203 OH	Hocking	1998 Hocking County Infrastructure Project
13142 OH	Meigs	1998 Dexter Rural Water Line Extension
12997 OH	Athens	1998 Athens Water Treatment Plant Improvements
13038 PA	Greene	1999 Meadow Ridge Business Park
13311 PA	Sullivan	1999 Dushore Borough/Cherry Township Water Extension
13318 PA	Luzerne	1999 Crestwood Industrial Park Expansion
13343 PA	Butler	1999 Victory Road Business Park
13584 PA	Cambria	2000 Cambria Iron Works Complex Repair and Rehabilitation
13644 PA	Fayette	2000 Fay-Penn Business Center Improvement, Overrun
13712 PA	Fayette	2000 Keystone Opportunity Zones Site Development Plans
14154 PA	Sullivan	2002 Endless Mountains Industrial Building Renovation
14862 PA	Bedford	2004 CANA High Speed Internet Access in Bedford County
14160 PA	Schuylkill	2002 Coaldale Business Site Development
12242 SC	Pickens	1998 Pickens County 18 Mile Creek Regional Sewer
13759 SC	Cherokee	2000 Gaffney/Clary Wastewater Treatment Plant Upgrade
13977 TN	Pickett	2001 Pickett County Water Line Extension
14941 TN	Hancock	2004 Hancock County Picture Archiving Communications System
13990 TN	Washington	2001 Washington Cnty. Industrial Park Water-Sewer Line Extension
13717 TN	Roane	2000 Macedonia Industrial Park-Phase One
13438 TN	Grundy	1999 Grundy County Industrial Building Renovation
13432 TN	Greene	1999 Greeneville Hardin Industrial Park
13381 TN	Johnson	1999 Mountain City Sewer Line Extension
13379 TN	Hancock	1999 Sneedville Utility District Water Line Replacement
13083 TN	Washington	1998 Johnson City Utility Line Relocation, American Water Heater
12775 TN	Greene	2000 Mosheim Wastewater Treatment Plant Expansion, Revision
14079 TN	Marion	2001 Browder Switch Industrial Park Infrastructure
12677 VA	Buchanan	1997 Slate Creek Water
13364 VA	multiple	1999 Mountain Empire Regional Business Incubator
13456 VA	Wise	1999 Indian Creek Water
13624 WV	Mingo	2000 Lick Creek /Mingo County Water, WV
13860 WV	multiple	2001 Upper Kanawha Valley Technology Center
12701 WV	Wyoming	1999 Mullens Sanitary Sewer
12953 WV	Fayette	1998 Mount Hope South Industrial Park

12957 WV	Hardy	1998 Hardy County Industrial Building
13205 WV	Mercer	1998 Brushfork Sewer Project

Appendix G. Interview-Contact List

Project ID	ProjName	FirstName	Last Name	Position
6302	Clifty Heights Elderly Rental Housing	Faye	O'Dell	former Program Specialist
6302	Clifty Heights Elderly Rental Housing	Ed	Massey	Executive Officer
6302	Federation of Appalachian Housing Enterprises	Faye	O'Dell	former Program Specialist
6302	Federation of Appalachian Housing Enterprises	Sarah	Morgan	Chief Program Officer
11278	Salt Lick Sewer Collection System	Mark	Collier	Grant Writer
11278	Salt Lick Sewer Collection System	Brad	Frazelle	Mayor
11685	Bessemer Airport Water Main Ext., Revision	Jack	Wright	Director of Comm. Development
11685	Bessemer Airport Water Main Ext., Revision	Troy	Post	
12011	Robbinsville Sewer Line Extension	Bobby	Cagle	Mayor
12242	Pickens County 18 Mile Creek Regional Sewer	William	Nicklaus	Director Environmental Servs.
12242	Pickens County 18 Mile Creek Regional Sewer	Ray	Farley	
12467	Louisville/Winston Cnty. Access Rd., Overrun	Phylis	Benson	Project Analyst, EDD
12660	Moulton Sewer Line Extension	Nora	Millican	Director of Grants and Loans
12677	Slate Creek Water	James	Baldwin	Director of Planning
12701	Mullens Sanitary Sewer	David	Cole	Executive Director
12701	Mullens Sanitary Sewer	Cathy	Mueller	City Clerk
12775	Mosheim Wastewater Treatment Plant Expansion	Beth	Duncan	Director
12932	Allegheny Business Center Feasibility Study	Matt	Diaz	Capital Project Manager
12942	Valley Head Sewer System	Marty	Smith	Town Clerk
12942	Valley Head Sewer System	Kim	Erwin	Consultant
12953	Mt Hope South Industrial Park	Connie	Lupardus	Executive Director
12957	Hardy County Industrial Building	Terry	Lively	Assistant Director
12983	Reform Water System Improvements	Jean	Rosene	Appalachian Programs Director
12983	Reform Water System Improvements	Winston	Richardson	
12997	Athens Water Treatment Plant Improvements	Misty	Casto	Development Director
12997	Athens Water Treatment Plant Improvements	Kystal	Kynard	Plant Manager
13001	Brooksville Sewer System Improvements	George	Crawford	District Planner
13002	NE MS Regional Water Supply Improvements	Denise	Farrar	Administrator
13002	NE MS Regional Water Supply Improvements	Shane	Holman	
13026	Hammondsport Industrial Access Road	Tom	McGarry	Economic Dev. Coordinator
13028	County Line Industrial Park/Smoke Rise Sewer	Jack	Wright	Director of Comm. Development
13038	Meadow Ridge Business Park	Donald	Chappel	Executive Director
13053	Prescott Avenue Industrial Access Road	Tom	McGarry	Economic Dev. Coordinator
13073	Bartow County Industrial Park	Lloyd	Frasier	Assistant Planning Director
13083	Johnson City Utility Line Relocation	Ken	Rea	Dir., Economic & Community Dev.
13083	Johnson City Utility Line Relocation	Jane	Myron	City Commissioner
13084	Phelps/Buskirk Sanitary Sewer System	Ronny	Brooks	Area Specialist
13102	Blairsville/Union County Industrial Park	Tom	Murphy	Executive Director
13117	Jefferson Water & Sewer Extension	Phil	Trew	Planning Director
13117	Jefferson Water & Sewer Extension	Cathy	Howell	
13125	Jackson Water Storage Tank Replacement	Benny	Hamilton	Assistant Director
13125	Jackson Water Storage Tank Replacement	Michael	Miller	Mayor
13135	Braselton Wastewater Expansion	Chris	McGahee	Director of Economic Dev.

13135	Braselton Wastewater Expansion	Jennifer	Scott	City Manager
13136	Jenkins Industrial Site Infrastructure	Benny	Hamilton	Assistant Director
13136	Jenkins Industrial Site Infrastructure	Joe	DePriest	ED Director
13138	Morehead Industrial Park Water Storage Tank	Rodney	Hitch	Executive Director
13138	Morehead Industrial Park Water Storage Tank	Billy	Winkelman	County Judge Executive
13142	Dexter Rural Water Line Extension	Misty	Casto	Development Director
13142	Dexter Rural Water Line Extension	Martin	Broderick	
13144	Huntsville Infrastructure/Research Park	Del	Schafer	Director of Economic Dev.
13160	Walthall Wastewater Treatment-Sewage Coll.	George	Crawford	District Planner
13162	Western MD Regional Video Switched Network	Guy	Winterburg	Assistant Director
13163	Carrs Fork/Littcarr Water Extension	Brian	Kirby	Project Administrator
13163	Carrs Fork/Littcarr Water Extension	Chris	Connell	Site Supervisor
13192	Whitley County Water	Tim	Schwenderman	Assistant Director for Econ. Dev.
13192	Whitley County Water	Mike	Patrick	Executive Judge
13201	Paintsville/Honey Branch Wastewater	Libby	Ratcliffe	Grants Administrator
13201	Paintsville/Honey Branch Wastewater	Denise	Thomas	Project Developer
13203	Hocking County Infrastructure Project	Misty	Casto	Development Director
13205	Bluefield/Brushfork Sewer Project	Terry	Honnaker	Director
13205	Bluefield/Brushfork Sewer Project	David	Cole	Executive Director
13311	Dushore/Cherry Township Water Extension	Jill	Koski	Economic Development Mgr.
13311	Dushore/Cherry Township Water Extension	Mike	Hufnagel	
13318	Crestwood Industrial Park Expansion	Richard	Muessing	Grants Manager
13322	Billy Branch Sewer Line	WT	Sorrell	Director
13322	Billy Branch Sewer Line	Linda	Story	
13343	Victory Road Business Park	Diane	Sheets	Executive Director
13358	Columbia/Adair County Industrial Park	Robert	Flowers	President/CEO
13364	Mountain Empire Regional Business Incubator	Duane	Miller	Director of Planning
13369	New Well & Distribution System	Steve	Adkins	General Manager
13379	Sneedville Utility District Water Line Replacement	Ken	Rea	Director of Economic Dev.
13381	Mountain City Sewer Line Extension	Jerry	Horn	Superintendent
13381	Mountain City Sewer Line Extension	Ken	Rea	Dir., Economic & Community Dev.
13384	Big Flats Sewer System Improvements	Tom	McGarry	Economic Dev. Coordinator
13385	Upper Potomac River Comm. Sewage Plant	Guy	Winterburg	Assistant Director
13406	Dawsonville Water System Improvements	Gary	Barr	Water & Sewer Superintendent
13406	Dawsonville Water System Improvements	Kim	Cornelison	City Clerk
13417	Winder Sewer System Expansion	Chris	McGahee	Director of Economic Dev.
13417	Winder Sewer System Expansion	Herb	Feldman	
13418	Madison County Water System Improvements	Chris	McGahee	Director of Economic Dev.
13424	Tishomingo Water District Study & Improvements	Kirby	McCray	Board of Supervisors
13424	Tishomingo Water District Study & Improvements	Dale	Price	Board of Supervisors
13432	Greeneville Hardin Industrial Park	Ken	Rea	Dir., Economic & Community Dev.
13438	Grundy County Industrial Building Renovation	Hal	Morris	Project Administrator
13438	Grundy County Industrial Building Renovation	Ledou	Bouldin	Mayor
13444	Garrett Information Enterprise Center Equipment	Lowell	Bender	Dean- Continuing Ed. & Training
13444	Garrett Information Enterprise Center Equipment	Lydia	Reiser	Director
13456	Indian Creek Water	Duane	Miller	Director of Planning
13482	Cumberland Rolling Mill Infrastructure	Jay	Oliver	Community Development Mgr.

13482	Cumberland Rolling Mill Infrastructure	Guy	Winterburg	Assistant Director
13483	Fort Payne Distribution Center Utilities	Jim	McGee	City Clerk
13487	Andrews Wastewater Plant-Coll. Improvements	Bill	Green	City Manager
13487	Andrews Wastewater Plant-Coll. Improvements	Tom	O'Brien	
13530	Belmont County Fox Commerce Park	Don	Myers	Executive Director
13533	David Wastewater Improvements	Ronnie	Rice	Chief Financial Officer
13566	Logan-Hocking Industrial Park	Misty	Casto	Development Director
13584	Cambria Iron Works Repair & Rehabilitation	Fred	Querry	Ass't Dir., Planning-Comm. Dev.
13621	Tompkinsville Industrial Park Development	Gene	Becker	Project administrator
13624	Lick Creek /Mingo County Water, WV	Jim	Boggs	Project Administrator
13624	Lick Creek /Mingo County Water, WV	Sheila	Irwin	Project Administrator
13628	Golden Triangle Airport Communications System	Phyllis	Benson	Project Analyst
13629	Monroe Industrial Park Building	Misty	Casto	Development Director
13630	McKinney Water Extension	Bob	Maples	Manager
13630	McKinney Water Extension	Jane	Combs	Chief of Grants and Aid
13644	Fay-Penn Business Center Improvement, Overrun	Tina	Wargo	Asset & Contract Manager
13712	Keystone Opportunity Zones Site Plans	Tina	Wargo	Asset and Contract Manager
13712	Keystone Opportunity Zones Site Plans	Donna	Bates	Economic Development Mgr.
13717	Macedonia Industrial Park-Phase One	Terry	Bobrowski	Exec Dir
13759	Gaffney/Clary Wastewater Treatment Plant	Kim	Fortner	Assistant Manager
13759	Gaffney/Clary Wastewater Treatment Plant	Dirk	Reis	
13762	Central Garrett Industrial Park Improvements	Guy	Winterburg	Assistant Director
13762	Central Garrett Industrial Park Improvements	Meg	Ellis	Project Manager
13797	McCreary County Prison Infrastructure	Waylon	Wright	Comm. Dev. Specialist
13860	Upper Kanawha Valley Technology Center	Robert	Wilson	Former, President
13862	Taylorsville Industrial Water	WT	Sorrell	Director
13862	Taylorsville Industrial Water	Sam	Erwin	
13866	Rock Springs Industrial Park Improvements	Lloyd	Frasier	Assistant Planning Director
13977	Pickett County Water Line Extension	Steven	Bilbrey	Mayor
13977	Pickett County Water Line Extension	Bill	Robbins	
13987	Stoney Fork/Red Bird/Saylor Hollow Water	Tim	Schwenderman	Assistant Director for Econ. Dev.
13990	Washington Cnty. Ind. Park Water-Sewer Line	Ken	Rea	Dir., Economic & Community Dev.
13990	Washington Cnty. Ind. Park Water-Sewer Line	PC	Snap	Director
14002	Ohio University Innovation Center	Linda	Clark	Director
14022	Troupsburg Wastewater Collection-Treatment	Tom	McGarry	Economic Dev. Coordinator
14022	Troupsburg Wastewater Collection-Treatment	Fred	Potter	Town Supervisor
14059	Icard Water Improvement	WT	Sorrell	Director
14059	Icard Water Improvement	Sam	Erwin	
14079	Browder Switch Industrial Park Infrastructure	Hale	Booth	Executive Director
14154	Endless Mountains Industrial Building Renovation	Jill	Koski	Economic Development Mgr.
14160	Coaldale Business Site Development	Tom	Pellegrini	VP Enterprise Development
14160	Coaldale Business Site Development	Mark	Scarbinsky	Director
14187	Monroe County Industrial Building	Ronnie	Boozer	Clerk-Controller
14187	Monroe County Industrial Building	John	Byers	Director of Technical Assistance
14191	Prentiss-Alcorn Water System Improvements	Brett	Brooks	Project Engineer
14191	Prentiss-Alcorn Water System Improvements	Walter	Bane	President
14197	Elkin Sewer Extension to I-77	WT	Sorrell	Director

14197	Elkin Sewer Extension to I-77	Pam	Stensil	Planning Director
14207	Reltoc Building Renovation	Jerry	Davis	Director and Operations Mgr.
14207	Reltoc Building Renovation	Suanne	Sockwell	
14278	Watkins Glen 2nd Street Water/Sewer Upgrade	Tom	McGarry	Economic Dev. Coordinator
14278	Watkins Glen 2nd Street Water/Sewer Upgrade	Mark	Specchi	Superintendent of Public Works
14299	Blue Ridge Telecenter Development	Phil	Trew	Planning Director
14303	NC Mutual Endeavor to Connect Communities	Eric	Brinke	Director of Econ Dev.
14303	NC Mutual Endeavor to Connect Communities	Charlie	Pittman	Director of Telecommunications
14383	Kemper County Incubator Expansion	Brian	Henson	Executive Directore
14611	Breathitt County/KY 30 Water Line, Phase I	Gary	Pridemore	Community Resources Planner
14611	Breathitt County/KY 30 Water Line, Phase I	Shannon	Moore	Superintendent
14862	CANA High Speed Access in Bedford County	Michele	Adams	Director, Planning & Comm. Dev.
14862	CANA High Speed Access in Bedford County	Carol	Snyder	Executive Director
14870	Epworth Broadband Initiative	Kristen	Gunia	Director of Economic Dev.
14870	Epworth Broadband Initiative	Eric	Brinke	Director of Economic Dev.
14941	Hancock County Picture Archiving System	Ken	Rea	Director of Economic Dev.
6302-19-05-C20	Irvine Downtown Project	Faye	O'Dell	former Program Specialist
6302-19-05-C20	Irvine Downtown Project	Brenda	Rice	Director
6302-C23	Safe Harbor Transitional Housing	Faye	O'Dell	former Program Specialist
6302-C23	Safe Harbor Transitional Housing	Eddie	Patton	Executive Director

Electronic Appendices**Appendix H. Electronic Impact-Interview Database****Appendix I. Project Impact-Interview Project Thumbnails****Appendix I. Project Area Economic Condition Thumbnails****Appendix J. Project Area Economic Condition Spreadsheet Details**