AN ANALYSIS OF THE GOVERNOR'S ROAD IMPROVEMENT PROGRAM (GRIP) FOR THE GEORGIA DEPARTMENT OF TRANSPORTATION

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EXECUTIVE SUMMARY

With Increasing globalization and deregulation, the state and national economies will continue to experience both increasing economic opportunities and periodic disruptions. With the twenty-first century rapidly approaching, it is increasingly evident that Georgia is entering into a new period of economic growth and risk. In order to ensure that the state continues to preform as an economic leader, careful planning and prudent policies must be enacted.

To significantly improve the transportation infrastructure throughout Georgia, the Governor's Road Improvement Program (GRIP) was initiated. Composed of sixteen corridors, the GRIP system converts existing primary routes and truck connecting routes into multi-lane highways. When completed, the system will place 98 percent of Georgia's population within twenty miles of a multi-lane highway, and provide access for oversized trucks to all cities having populations above 2,000.

This report was developed to profile the economic effects associated with the GRIP system and discuss them in the context of the socio-economic and demographic factors that characterize the state economy and its people. It includes a discussion of the historic forces influencing economic development in rural areas, as well as a discussion of the role of transportation infrastructure on rural economic development. Finally, it provides an analysis of seven demographic indicators and demonstrates the impact of the GRIP corridors on ten rural Georgia counties. The seven economic indicators include retail sales, total net digest, per capita income, transfer payments, total unemployment, unemployment by race and sex, and total buying power.

The study area for this report was determined on the basis of three factors: nonmetropolitan status, being located on a partially completed GRIP corridor, and having returned a previous GRIP survey conducted by the Department of Transportation. The counties chosen were Bulloch, Charlton, Coffee, Elbert, Glynn, Haralson, Long, Thomas, Union, and Worth.

The report illustrates the following points:

- The historic lack of economic diversification in rural areas, combined with increased agricultural mechanization has lead to high levels of unemployment and population loss in some rural counties.

- Declining population and high unemployment places increased demands on local government while at the same time leads to diminished revenue. This situation often results in a decline in basic services such as education.

- Although rural population decline was halted briefly in the 1970's and the 1990's, the lack of economic diversification in rural areas will undoubtedly lead to more rural population loss with the next agricultural and economic downturn.

- From the time of Adam Smith, economists have held that transportation infrastructures improvements increase economic growth by expanding markets and providing for increased specialization of labor.

- Transportation infrastructure improvements directly help businesses by decreasing their shipping costs and expanding their access to markets. Transportation infrastructure improvements also benefit workers, who have increased employment opportunities as travel times and costs are reduced.

- Adequate transportation infrastructures are essential to numerous economic sectors, including manufacturing, agriculture, tourism, and the service sector.

- In the ten county study region, the increase in total retail sales was greater than the state, metropolitan, or nonmetropolitan counties' averages.

- Increases in total net digest were on par with increases for Georgia's nonmetropolitan counties during the study period.

- Per capita income increased in the ten county region at a rate greater than the average for the state, metropolitan, and nonmetropolitan counties.

- Transfer payments increased at a rate lower than increases for the state average, metropolitan county and the nonmetropolitan county averages. The net effect of a decreasing transfer payment rate is increased job opportunities.

- During the study period, total unemployment decreased at a rate greater than that for the state, metropolitan, and nonmetropolitan county averages.

- During the study period, unemployment rates for women in the ten county region fell on average greater than averages for the state, metropolitan, and nonmetropolitan counties.

- During the study period, unemployment rates for African-Americans fell on average at a rate greater than averages for the state and nonmetropolitan counties.

- During the study period, total buying power increased in the ten county study region at a rate greater than the average for either the state, metropolitan, or non-metropolitan counties.

- The ten nonmetropolitan counties in the study group experienced pronounced economic improvements in comparison to their nonmetropolitan counterparts.

While the study finds GRIP study counties appeared to fare significantly better than their nonmetropolitan counterparts, these results must be viewed with caution. Economic development does not depend on transportation alone. Transportation improvements must be accompanied by community development improvements such as increased educational and vocational training, job readiness skills, quality day care, and

available and affordable housing. Equally important is the cooperation between state and local governmental officials and the private sector. Without an effective and efficient transportation system, however, economic development will not occur.

OBJECTIVES

The objective of this report is to profile the economic benefits associated with the Governor's Road Improvement Program (GRIP). The GRIP program, initiated in the 1980's by the Governor and the Legislature, represents a major state effort to widen two lane roads and stimulate economic development by improving the transportation network.

There are sixteen corridors in the GRIP system (see Appendix A). These corridors are economic development highways consisting of existing primary routes and truck connecting routes. When completed, the system will place 98 percent of Georgia's population within twenty miles of a multi-lane highway. It also will provide access for oversized trucks to all cities having populations above 2,000.

This report analyzes contemporary rural transportation improvements issues against the backdrop of the state's changing economic and demographic environment. This perspective provides a starting point for understanding Georgia's current and projected economic development needs. The intended audiences for the report are policy makers at the Georgia Department of Transportation, elected officials, Chamber of Commerce personnel, industrial authority members, individuals in the private sector, and other interested citizens. Due to the wide variety of individuals and groups involved in economic development and transportation improvement activities, a series of easy-to-read and understand maps, charts, and graphs were specifically developed to illustrate the statistical trends associated with economic development and highway transportation.

SCOPE

Using county-level information collected by various federal and state governmental agencies, a demographic, economic, and transportation profile of ten counties located within the partially completed Governor's Road Improvement Program (GRIP) corridors was developed. The ten counties were chosen from a group of nonmetropolitan counties returning a survey conducted in the fall of 1996 by the Georgia Department of Transportation. Selected economic and demographic characteristics for the ten study counties are compared with the state, metropolitan, and nonmetropolitan average. This format was developed to illustrate the overall distribution and patterns of economic growth occurring in the ten county study area. A set of selected social, economic, and demographic facts and figures for each of the ten counties will also be presented.

THE IMPORTANCE OF COUNTY-LEVEL DATA

Comprehensive planning requires basic information about the local community. Up-to-date, easy-to-understand, and unbiased information plays an important role in the planning process. County-level data is the basic unit of analysis for most governmental agencies because of the high costs associated with the collection of data below the county level. The distribution of political subdivisions below the county level is enormous. For example, Georgia has 535 municipalities.

Although methodological problems occur, effective planning studies can be conducted with county-level data if limitations are recognized. For instance, planners face major problems if they equate the county with a community because a significant amount of research has shown that some county residents lack a feeling of unity that many community scholars feel is necessary for the formation of a "true community." (Warren and Lyon, 1988). In addition, because the information is aggregated, interpretation may present problems where several communities make up a county. Interpretation problems also arise in communities that are physically

located at the border of a county, or where people live in one county but work in another.

Another problem associated with the use of county level data for this study is the fact that most of the GRIP corridors are NOT completed. Therefore, the full impact of the improvements cannot be fully appreciated until the links are all connected. Also, because parts of the expanded highways have just recently been completed, their full economic benefit cannot accurately be measured at this time.

Despite the problems surrounding county-level data, its usefulness overcomes its limitations for several reasons. First, a large amount of county-level information is generated by both federal and state-level governmental agencies. Second, the low cost and accessibility of county-level data permits a wide variety of individuals and agencies to gain a comprehensive understanding of the social, economic and demographic conditions shaping the state, regions and counties. Additionally, the data is relatively accurate because the information is filtered through a host of local and state-level governmental employees who have close working knowledge of the subject area.

THE HISTORIC LACK OF ECONOMIC DEVELOPMENT IN RURAL AREAS

Rural Georgia was once dominated by agriculture. Agriculture, however, has undergone tremendous changes since World War II. The number of farms in Georgia has fallen sharply while average farm size increased. For the state as a whole, farm size increased from 105 acres in 1945 to 246 acres in 1992. (Boatright and Bachtel, 1997) Over the past five decades, increased mechanization, the use of improved crop varieties, expanded markets, chemical fertilizer, insecticides and pesticides have transformed the production of food and fiber. Using science and technology, innovative farmers have changed Georgia's agriculture from a small scale, labor intensive business into a capital intensive, market driven, corporate enterprise.

The changing nature of agriculture has played a major role in shaping many of Georgia's social, economic, and political trends. For example, the mass movement of people from rural to urban areas that began in the late 1920's was chiefly the result of mechanization which dramatically decreased the high dependence on farm labor. The boll weevil also played a role by its devastating effect on cotton, further reducing the need for a large rural labor force. Many left in search of new careers in the cities. The magnitude of this trend is evident by examining county-level population data. Today, 44 counties have fewer residents today than in 1930! (Boatright and Bachtel, 1997)

Farming, however, remains a significant contributor to the state's economy. The decline in farms is a fundamental problem for rural decision makers because it signals the loss of jobs and population. This in turn affects the businesses that cater to farmers and their families. The loss of rural farm customers is especially severe for small businesses which are dependent on agriculture or agribusiness. Agriculture is exacting for rural decision makers because of its boom or bust nature. A serious consequence of a declining agricultural economy is a decreased tax base, a situation particularly critical in areas where funding for education problematic.

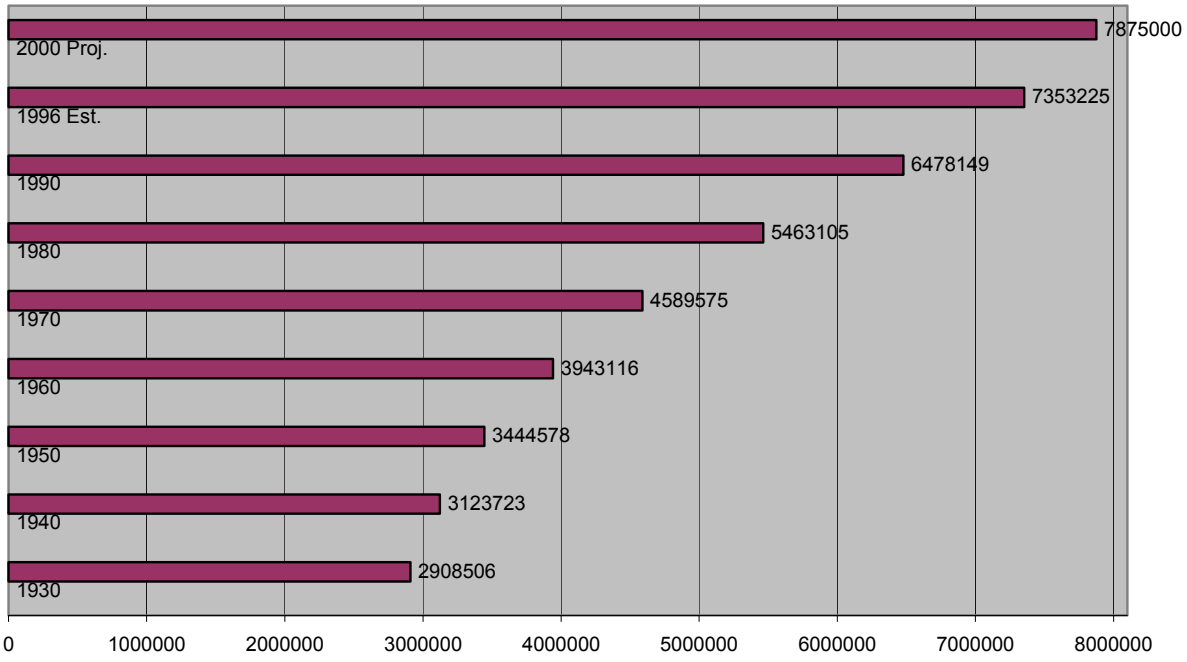
The loss of the farm population reduces rural tax bases and hastens economic decline, and this decline will continue unless new development occurs. The implications of this trend is important for all Georgians, both rural and urban. For decades rural residents have migrated to the cities. Unfortunately, many of these individuals possessed lower educational attainment and skill levels. In times of strained and reduced budgets, urban decision makers do not need a continual supply of new residents who are unable to compete in a fast paced, technologically driven market place.

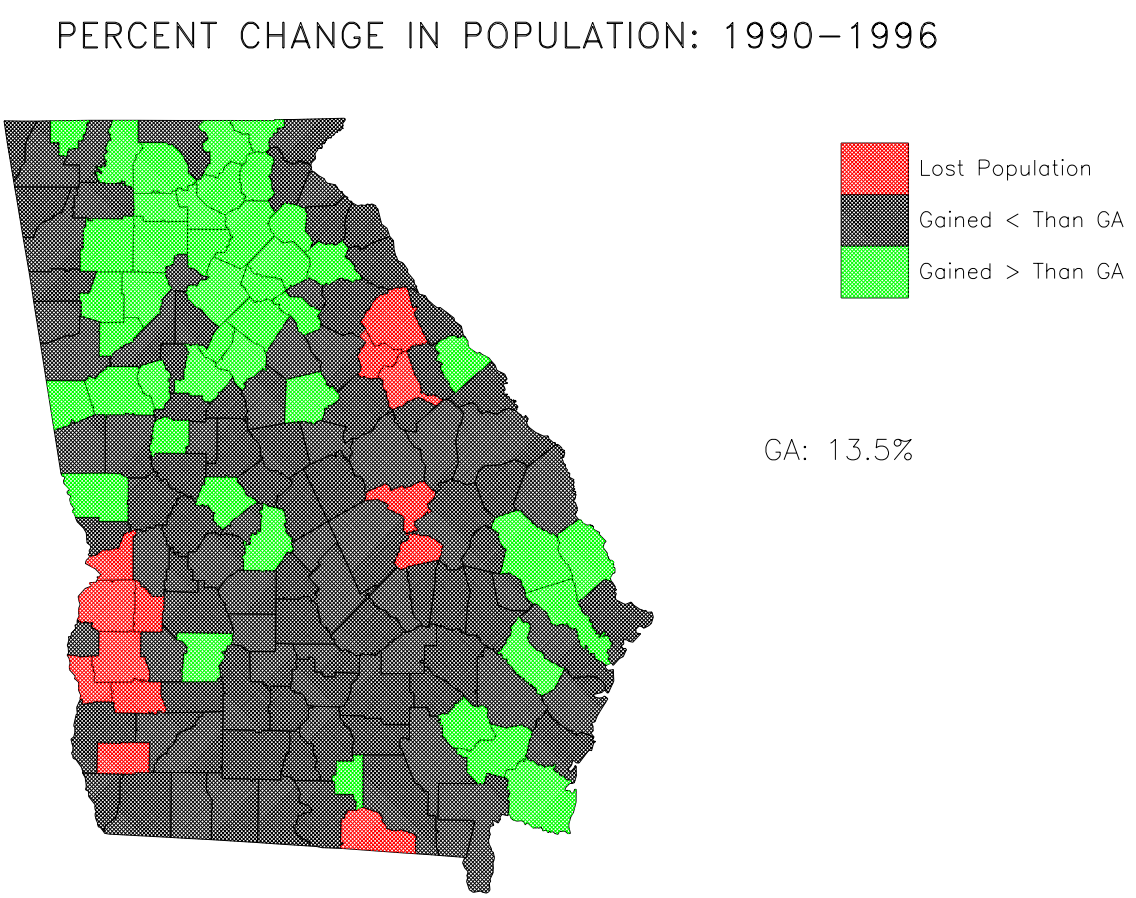
The lack of economic diversification across rural Georgia creates major problems for small scale economies, because when the major employer suffers a slowdown or setback, there are no other viable economic alternatives and people are forced to leave. In areas dependent upon one or two economic contributors, population losses follow economic decline. Communities losing population face a major problem of providing

fundamental public services such as education and community-based health facilities. Without these particular services it becomes difficult to retain coming generations and nearly impossible to attract new industries and families. Once a population starts to decline, it becomes extremely difficult to reverse the process or to resume past levels of development.

The lack of economic diversification across rural Georgia creates major problems for small scale economies, because when the major employer suffers a slowdown or setback there are no other viable economic alternatives and people are forced to leave. In many rural areas, the government is the major source of revenue and jobs. Historic dependence on government spending in rural areas must be dealt with in a comprehensive manner. Currently, 68 nonmetropolitan counties have more than 20 percent of their work force employed by state and local government (Boatright and Bachtel, 1997). With the trend toward reduced governmental spending and the consolidation of services, a large portion of the governmental work force may face gradual cutbacks and possible elimination.

Figure 1: TOTAL POPULATION OF GEORGIA
(Projected growth 1990-2000: 21.6% U.S. Census)





POPULATION TRENDS

Recently released U.S. Census data indicates that from 1990 to 1996, Georgia's population increased by 875,076, or 13.5 percent (see Figure 1 and Figure 2). During this time, Georgia was the seventh fastest growing state on a percentage basis and was the fourth fastest growing state in the nation on a numeric basis (U.S. Statistical Abstract, 1997). Among all fifty states, Georgia has the tenth largest population. Georgia is the largest state East of the Mississippi river with 59,441.2 square miles, and ranks twenty-fourth among states in total area (Bachtel and Boatright, *Passport to Georgia,* 1996).

Historically, the state had experienced steady growth since the 1930's (see Figure 1). The population growth, however, has been uneven, scattered across the state in

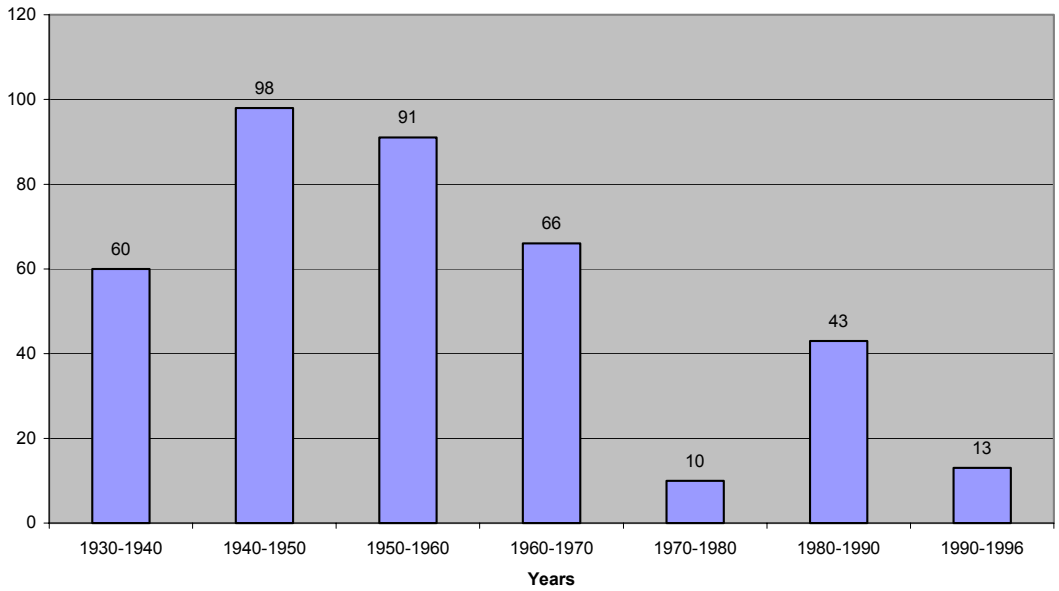
selected areas. Information in the Figure 3 reveals the number of counties that have lost population every decade since the 1930's. The long-term trend is overall state growth with large numbers of mostly rural counties losing population. This pattern, however, was interrupted during the 1970's, when only 10 counties lost population. This trend was called the "rural turnaround" and occurred across the nation. In the 1970's, rural areas were growing because of six factors. First, with the completion of the interstate highway system, transportation in and out of rural areas was significantly easier than in previous years. Second, many companies were expanding into rural areas because of relatively cheap labor and site acquisition costs. Third, agriculture experienced record prices, low interest rates, and operated under a governmental policy that encouraged farmers to plant "fence row to fence row". As a result, farmers with excess cash and increased buying power created additional job opportunities. Fourth, a significant number of retirees were choosing small towns as retirement centers. Their presence also created jobs and investments. Fifth, America's urban centers experienced high levels of crime, pollution, and racial unrest. As the appeal of urban living decreased, rural areas became increasingly attractive places to live and work. Finally, rural areas experienced a gradual improvement in the quality of life amenities. Communication, transportation, medical services, and educational facilities were all improving. Many Georgians who desired small town and rural living in the 1970's could finally find employment in these areas. These factors also created an environment where rural young people could find employment opportunities in their home towns instead of migrating to the cities.

In the 1980's, all of the above mentioned factors abruptly declined. Instead of locating business in rural Georgia, companies were moving to the Pacific Rim. In addition, urban areas were becoming more attractive. Yuppies and urban homesteading were in fashion, and agriculture suffered deep set backs from events such as increased international competition, drought, and low prices. During the 1980's, 43 counties in Georgia lost population. Thus, Georgia slipped back into the old pattern of rural population decline.

In the 1990's, however, Georgia may once again be experiencing another "rural turnaround" or "rural renaissance". Only 13 counties lost population during the first six years of the new decade (see Figures 2 and 3). Here are the reasons. First and foremost, agriculture has experienced continued growth. Agriculture prices have reached record levels, and in 1996, cotton surpassed the 1953 all time production level. Poultry is also expanding in South Georgia. Canola, a financially lucrative oil seed crop, is being planted in place of winter wheat.

Second, with the advent of the computer, world-wide web, modem, and faxes, rural people can electronically access business offices not only across the nation but overseas. Third, the developmental highway system permits many rural areas to be easily accessible by car and truck. Finally, concerted leadership efforts appear to be paying off. Rural decision makers and citizens have been working hard to attract businesses and improve their communities. For example, the South Georgia Chamber of Commerce is a viable, sixty-one member multi-county organization that typifies the

Figure 3: COUNTIES LOSING POPULATION GEORGIA



strong leadership being shown in South Georgia. Maintaining a viable economic base is important for the continued growth and prosperity of rural Georgia and the entire state.

THE IMPORTANCE OF PLANNING

Planning in a changing environment requires information about how demographic, economic, and transportation trends influence local issues for several reasons. First, with the substantial growth in population that Georgia is experiencing, it is important to know where the growth is occurring so that the business community and labor market can adjust accordingly. Increased population growth will also mean that transportation improvements will have to be studied. These efforts must also examine the role of public transportation, particularly in rural areas. Third, the growing complexity of the national and world economies, and the changing means of production from a manufacturing and natural resource-based economy to an information and service driven one, will place a greater burden on the state's educational systems because of the need for a sophisticated work force. Fourth, the proliferation of low wage, low skill service and retail sector jobs will present a unique set of problems because of the difficulty of attracting motivated, loyal workers willing to work in a low wage, low skill yet demanding environment. The lack of opportunity for advancement in many of these occupations also will hinder the recruitment of loyal workers. Fifth, because of the demands made by special interest groups, decision makers will be required to make more thorough and thoughtful efforts to devise and implement new projects and programs. Finally, unless rural decision makers plan for future development they will not be able to control growth and anticipate the necessary changes they will have to undertake to avoid population loses and economic decline. The population trends graphically shown in Figure 3 clearly illustrate the cyclical nature of rural growth and decline.

As rural Georgia evolves from a traditional agrarian-dominated area into one with increasingly sophisticated trade, manufacturing, education, tourism and retirement centers, decision makers will face difficult choices. These will require significant changes to be made in state and local governmental policies and procedures due to the

need for regional planning activities. Major planning issues will involve transportation, affordable housing, quality education, and the expansion of landfills.

IMPACT OF INTERNATIONAL TRADE AGREEMENTS

Although the North American Free Trade Agreement (NAFTA) and the General Agreement on Tariffs and Trade (GATT) has opened more of the world's markets to American goods, the two treaties also unlocked American markets to a flood of foreign-made products, as well. The result has been that some industries, particularly those that manufacture technologically advanced products have seen sales increase. Conversely, other industries, particularly labor-intensive ones such as apparel, have found themselves unable to compete with countries where wages are much lower than in the United States. Because the treaties contain language that prohibits restrictions on trade, many environmental and worker safety concerns have been expressed. Although the short-range effects are becoming clear, the long-range consequences are yet to be measured. Regardless of the technical nature of industry, without an adequate transportation network to import raw materials, distribute the finished product, and secure labor, industrial expansion in rural areas simply will not occur.

THE ROLE OF TRANSPORTATION IN THE BUSINESS AND INDUSTRIAL LOCATION PROCESS

Community leaders in both rural and urban areas are in a constant struggle to improve the quality of life for local residents (Rathge, Goreham, and Nundahl, 1992). In order to accomplish this task, local decision makers must recognize that economic development strategies are continually changing. New policies, technologies, and labor market conditions constantly shift and change on a regular basis. As a result, responding to these changing conditions in a rapid and decisive manner in order to take advantage of new opportunities and challenges is critical for success.

The importance of transportation, particularity the role of highways, as a stimulus to the business and industrial location process has been subject to a host of varying

interpretations and evaluations. Few would deny that economic development requires an “adequate” transportation system, however, limited consensus regarding the priority attached to highway construction in economic development programs exists.

The concept that the expansion of local business and industrial developmental activities is a direct result of improved transportation facilities can be traced back to Adam Smith’s argument that the division of labor is limited by the extent of the market (Hansen, 1973). Thus, improved transportation facilities should produce more rapid economic growth by helping to expand the market and bring about greater specialization of labor. A significant number of empirical studies confirm a strong correlation between highway infrastructure and increased levels of industry and employment growth. For instance, Smith, Deaton, and Kelch (1978) found a significant correlation between highway access and the probability of attracting manufacturing plants in a study of Kentucky and Tennessee counties. Carilino and Mills (1987) determined that interstate highway density (highway mileage per square mile) was strongly correlated with job growth. In 1988, McHugh and Wilkinson performed a re-analysis of Carlino and Mills data and confirmed the previous findings of a correlation between employment growth and interstate highway density. Fox and Murray in 1990 determined that both East-West and North-South interstate corridors contributed to an increase in firm startup rates.

In general, highways enable goods and people to be transferred between and within producing and consuming centers. Highway construction also tends to alter the relative factor cost by lowering shipment costs and reducing the time and resources required to move inputs into the area or outputs out of the area (Kuehn and West, 1971 and Munnell, 1990). Further, highways serve as a public good to be enjoyed by those living in or traveling through an area. Improved or newly constructed highways make possible faster, safer, cheaper, and more dependable transportation. The availability of good roads in the region may well be enough to encourage expansion of existing industry or location of new firms in the region (Kuehn and West, 1971 and Munnell, 1990).

The importance of highways and economic development also has been linked to the growth center concept, which has played a major part in the regional development strategies of many countries, including the United States (Hansen, 1972). The rationale for a growth center strategy rests heavily on the observation that the distribution of economic activity often provides firms with collective benefits that they would not receive in isolated locations. These take the form of external economies of agglomeration, as distinguished from the internal economies that a firm may generate from the expansion of its own organization (Kuklinski, 1972). It has been argued that lagging regions can be most efficiently developed by concentrating public and private investment in a few growth centers, and the "increased effects" from induced-growth centers will eventually bring greater prosperity to the surrounding hinterland areas (Hansen, 1972 and Munnell, 1990).

The concept of economic development has evolved into a broad concept that pertains to the material aspects of community growth. It involves the growth of income and wealth, equitable distribution of income, growth and retention of business and industry, and increased job opportunities. Good transportation facilities support economic development by lowering the transport costs of users of the transportation network.

DIRECT TRANSPORTATION BENEFITS

Transportation has direct and indirect economic benefits. Direct user benefits are reductions in travel times and fuel consumption, increased reliability, and increased safety in the movement of goods and workers. As transportation costs are reduced, resources are freed for other purposes. Businesses directly benefit when goods can be shipped more efficiently, faster, or at lower cost. Both businesses and individuals benefit when travel times and costs are lowered. Besides the inherent value of increased mobility, individuals can benefit from increased employment opportunities as travel time is reduced. At the same time, the supply of labor to area employers increases as more potential employees fall within their labor shed (Transportation and Economic Development, 1994).

INDIRECT ECONOMIC BENEFITS

There are also indirect effects of the highway system on the local economy. These indirect effects may include the expansion of existing businesses as reduced transportation costs result in greater profitability and/or increased market share which leads to increased employment and incomes as businesses expand. Furthermore, economic activity may expand as these local firms in turn demand more raw materials and components from their suppliers. Finally, retail and service businesses can grow as employees spend their additional incomes in local establishments (Transportation and Economic Development, 1994).

It is widely recognized that highway improvements and economic development are mutually reinforcing processes (Kusmin, 1994). Improved transportation facilities stimulate and support economic growth, which leads to increased demand for additional growth and development. In other words, growth begets growth. Conversely, a spiral of decline also can occur.

IMPORTANCE OF TRANSPORTATION TO MANUFACTURING

Manufacturing is the base in which many community leaders see the future. Not only do communities benefit from the addition or expansion of manufacturing firms, but the service and retail sector also profit from an expanding manufacturing sector. When a plant locates within a community, a multiplier effect takes hold. New workers with their new incomes require basic needs. These needs include food, housing, education, recreation and other components. It has been estimated that a dollar will change hands anywhere from three to ten times depending on the sophistication of the local economy (Summers, 1976, and Bartik, 1991).

Transportation is critical to the manufacturing sector. Manufacturers who use Just In Time (JIT) inventory techniques to manage and minimize overall logistics costs are particularly dependent on trucking, both for the supplies they use and for outgoing

shipments of their products. Intermodal movements that involve rail or water also involve transport by truck at the origin or the destination of the shipment.

The changing nature of business has altered the transportation landscape. Currently, less than 150 firms in Georgia have more than 1000 workers (County Business Patterns, 1994). Thus, a large portion of the business growth in Georgia has occurred from smaller manufacturing firms with less than 20 employees. In this type of environment, shipping companies such as United Parcel Service and Federal Express play a major role in not only supplying inputs but distributing products as well. If this trend continues, firms will continue to decentralize and become smaller and smaller. The end result of this trend will be the necessity for a decentralized network of four lane highways to accommodate these small firms. If local communities implement improvements in highway infrastructure, these projects should help to make Georgia a more desirable location for the firms of the future.

IMPORTANCE OF TRANSPORTATION TO AGRICULTURE

Farmers are dependent upon local, county, and state roads that link them with suppliers and customers at rail and water terminals, food processing plants, and farmer markets. A widespread and well-constructed transportation system linking producers with their suppliers and customers lowers overall shipping and production costs, thereby increasing farm incomes.

IMPORTANCE OF TRANSPORTATION TO TOURISM

Since a significant proportion of tourism in the U.S. and Georgia is dependent on personal passenger car, and highways are of direct importance to tourism. Tourists use both higher volume Interstate and State highways and lower volume roads as they travel to vacation and recreation centers. A highway network that minimizes travel times and costs makes tourist travel easier and more economical, thereby encouraging more of it, and freeing tourist dollars for other expenditures in the state while encouraging return visits.

IMPORTANCE OF TRANSPORTATION TO SERVICES

Businesses in the service sector rely upon contact between customer and provider. Those which serve local community needs, such as beauticians, dry cleaners, and professional services, depend on customers who travel by automobile. Businesses serving regional needs, such as hospitals and financial services, are also dependent upon good highway networks. Firms serving national and international customers are also reliant upon highways for trips between airports and rail stations to the business.

Intense competition for jobs has stimulated many state transportation departments to incorporate economic development in their transportation planning. A major objective of economic development is the creation of new jobs or retention of existing jobs by building and improving highways. These improvements aim to reduce firms' transportation costs. Lower transportation costs are incentives to firms to locate or expand because they enable businesses to produce more efficiently and compete more effectively. Increased efficiency also implies that firms are likely to increase employment, output, market share, and profitability. The most immediate beneficiaries of transportation improvements are owners (i.e., shareholders) and employees whose profit and wage incomes increase. Other beneficiaries include the communities in which the enhanced incomes are spent, and local, state, and federal governments that collect increased tax revenues. Customers of firms also benefit when reduced transportation costs are reflected in lower prices or faster response times.

Considerable disagreement, however, exists with regard to the notion that highways are essential to economic development. Some researchers recognize their importance, but put more emphasis on their permissible role (Hawkins, 1962). Many believe that the development process involves a complex interaction between human and material resources, with transportation presenting an opportunity for developing other resources (Hirschman, 1958 and Munnell, 1990).

Besides those who have either espoused the primal role of transportation in the economic development process, or else emphasized its permissible nature, some researchers believe that too much emphasis on transportation may have a negative effect on long-run growth if it absorbs resources that have more profitable alternative uses (Hansen, 1965 and Porterfield, 1990). Although accessibility may be a problem, economically lagging regions may have greater needs for better education and training, more rational use of natural resources, a more diversified industrial/business mix, and less traditional attitudes toward work and migration. On the other hand, it has been argued that highways should not be judged purely on a narrow economic function, because they may be an integral part of investment in human resources (Hansen, 1973 and Sears, 1992).

Decision makers will be required to make more thorough and more thoughtful efforts to devise and implement new transportation programs. A narrow view of policy-making can only foster inability to forecast the future 10 or 20 years into the future. The result could be ill-advised programs that react to change rather than anticipate change. Future economic planning activities will require a two-pronged attack that emphasizes a business-oriented climate with the continued development of basic service needs such as transportation, utilities, public safety, and expanding educational facilities. Creative tax structures and public-private cooperation also will be needed in order to maintain a dynamic economy. Special attention needs to be given to the creation of non-service sector employment opportunities. These programs also must take into consideration the changing composition of the labor force. As a result, job readiness, job training, and access to reliable transportation is a vital component of economic development planning

(Bachtel and Morris, 1994). These programs must also take into consideration the growing number of women in today's labor force and the need for quality day care centers (Bachtel and Cammack, 1997).

IMPACT OF TRANSPORTATION ON THE INDUSTRIAL LOCATION DECISION MAKING PROCESS

Previous research does not offer many clear and incontestable answers to questions of economic development and transportation improvements. Given the fast pace changes occurring in technology, social institutions and public policy, the market is constantly changing, opening to new products and services while making others obsolete. With the unpredictable nature of the economic future, it makes little sense to turn to one sector as an economic panacea. Any effective program for economic development must employ a diverse set of elements in formulating an effective strategy for industrial development. In this manner, if unexpected economic developments thwart one element of a developmental strategy, other elements can still fuel net economic growth.

Beyond diversification, an economic development strategy must answer the question of how to evaluate components of an over-all strategy Although the various views of economists were cited above in trying to evaluate the economic impact of increasing the highway transportation infrastructure, another way of assessing the economic impact of improved highways is through an examination of what trade journals contend are leading factors in the industrial location decision making process. One such journal, *Area Development*, has conducted surveys of corporate executives and managers in order assess the most important factors in industrial site location. Five years of survey data were obtained, from the years 1993-1996 and the year 1989. The proximity to four lane highways was ranked fourth in both 1996 and 1993. Proximity to four lane highways was ranked second in 1995, and ranked as most important, even beating out labor quality, in 1994. With regards to the factors in industrial site location, *Area Development* stated in 1995, “Over the 10-year period the survey has been conducted, there has been remarkable consistency in the ratings our readers place on

various site location factors." Thus, the importance of proximity to highways has been a consistently important factor in the industrial site location factors according to the *Area Development* surveys of business leaders

This finding is paralleled in other trade journals as well. For instance, articles in *Economic Development Review* in 1994 discussed various site location factors. In terms of infrastructure factors, they concluded based upon surveys from real estate executives that "of the four specific infrastructure related selection factors, the most oft-cited location factor was access to major highways. Upwards of 93 percent of the respondents named highways as at least a moderately important factor, ranking it the third most important site selection factor in the entire survey" (Economic Development

TABLE TWO

TABLE OF TOP FIVE FACTORS IN INDUSTRIAL SITE SELECTION ACCORDING TO *AREA DEVELOPMENT* IN 1995

Ranking	Site Selection Factor	Percentage Responding "Important" or "Very Important"
1	Labor Costs	94.2
2	Highway Accessibility	93.6
3	Occupancy or Construction Costs	90.2
4	Energy Availability and Cost	89.6
5	Availability of Skilled Labor	87.9

Review, 1994). The importance of highway accessibility in the industrial site location process has also been highlighted by prominent leaders in business and government. For instance, the *Oglethorpe Power Economic Development Series* shows changes in

the site selection process. In the 1990's, highway accessibility was the second most important site selection factor. In the 1970's, highway accessibility figured as the fourth most important factor. This illustrates not only the consistent and prominent importance of highway accessibility, but also how its importance has steadily grown in the last 25 years.

In a telephone interview, the Director of Industry and Trade, Mr. George Rogers, cited transportation infrastructure, particularly highway accessibility, as being a crucial factor in the industrial site selection decision making process. Thus, despite academic disputes between researchers concerning the desirability of improving highway infrastructure, the consistent voice of trade journals, business, civic and government leaders actually involved in the industrial site selection process is that highway accessibility has consistently remained a significant factor in the industrial site selection process.

TABLE THREE
KEY SITE SELECTION FACTORS ACCORDING TO *OGLETHORPE POWER ECONOMIC DEVELOPMENT SERIES*

1970's	1990's
1. Environmental Considerations	1. Proximity to customers/clients
2. Labor Factors, Quality and Supply	2. Access to Interstate Highway
3. Availability of Utilities	3. Reasonable Real Estate Costs
4. Transportation, Primarily Highways	4. Availability of Skilled Workers
5. Trend to Rural Areas and Suburbs	5. Pro-Business Gov't Officials
6. Community Attitudes Toward Industry	6. Reasonable Wage Rates
7. Low-Cost Financing	7. Reasonable/Stable Utility Rates

8. Supply and Cost of Available Land	8. Reasonable Costs of Living
9. Markets	9. Reasonable Business Taxes
10. Taxes	10. Cultural/Recreational Facilities

Local government decision makers seeking to locate industries within its respective community can only operate through certain fixed channels (See Table Four). One such channel is improving highway infrastructure. By itself, improving highway infrastructure will not miraculously bring industries to a community. However, as an element in a total plan to re-locate a firm to a local community, improving highway infrastructure can be a very important and significant factor in making an area more desirable for industry. Furthermore, there are reasons to believe that highway accessibility will be an increasingly important factor in the future, given recent changes in the manufacturing sector.

Of the factors important in the industrial site selection process, some factors are susceptible to the influence of local communities. If local decision makers seek to make their community more desirable to industry, there are numerous factors which it can directly influence (See Table 2). Factors such as police and fire services, adequate solid waster disposal and processing facilities, favorable zoning ordinances, competitive insurance rates, and the presence of local industrial development groups are factors which community leaders can easily influence. Factors such as rail service, air freight services, highway infrastructure, the existence of a highly skilled labor force, and vocational training and higher education facilities are factors which local communities can affect to some degree. Finally, factors such as the availability of natural gas, raw industrial water supply, soil bearing capacity, water transportation, and the pool of unskilled workers can not be influenced significantly by local community decision makers.

The major lesson which can be drawn from the review of the impact of transportation in the economic development process is that community decision-makers must try to look beyond their own, immediate concerns and carry out comprehensive, long-range area development programs. The diffusion of economic effects over not only wide geographical areas, but across community institutions accentuates the integrated character of local economies and reaffirms the necessity for comprehensive development efforts.

Understanding how transportation interacts with current and projected economic and demographic trends such as labor force characteristics, job growth activities, and population growth permits decision makers to better prepare for an uncertain future. A key consideration in this process is the potential mis-match that exists between labor force demand and supply. If present trends continue, will there be enough skilled workers to qualify for the future workforce? Can the state continue to maintain a strong, diversified economy capable of enduring economic downturns and recessions? Are partnerships currently being forged to link businesses, schools, and students together to produce a quality work force? These and other questions will have to be answered in order for Georgia to remain competitive.

TABLE FOUR

FACTORS BEYOND CONTROL OF LOCAL COMMUNITIES

Factors Local Communities Can Directly Alter	**Factors Local Communities May Influence**	**Factors Beyond Control of Local Communities**
Fire protection	Major highway within 30 minutes	Natural gas service
Contract tucking	Scheduled rail service	Pool of unskilled worker
Police protection	Pool of trained workers	Raw industrial water supply

Processed industrial sewage water supply	Scheduled air freight	Soil bearing capacity
Industrial sewage processing	Vocational training facilities	Water transportation
Solid waste disposal	Higher educational facilities	
Tax incentives or holidays		
Lenient industrial zoning		
Local industrial development group		
Local industrial bonds		
Public warehousing		

SKILLED BLUE COLLAR LABOR SHORTAGES

Due to a variety of different demographic and economic trends, the GRIP strategy may have several different unintended economic development consequences. For example, because of Georgia's unprecedented economic and population growth, the state is beginning to experience labor shortages, particularity in skilled blue collar positions. During the 1990's, 60 percent of the state's population growth was from new residents. A vast majority of these new residents have relatively high educational attainment and skill levels. They also tend to have occupations such as managers, sales representatives, health care professionals, and other white collar type of positions. On the other hand, skilled blue collar labor tends to be a "home grown commodity". Individuals in these positions simply do not move as frequently as their white collar counterparts. In growing areas, however, the demand for skilled blue collar occupations is significant.

Because of the challenges associated with labor shortages, the GRIP system will permit the relatively easy movement of labor between regional growth centers. This function represents an important aspect of rural economic development because may rural areas and small towns lack available and affordable housing (Boatright and Bachtel, 1997). Thus, the efficient and cost effective movement of labor may prove to be a critically important role of the GRIP system.

Anticipating future problems however is difficult because current problems may not be the same ones decision makers will face in the future. Some issues, however, will continue to affect economic development. The following obstacles must be considered as rural decision makers develop strategies for the future. They are: the unequal distribution of resources, disorder in the financial world (at the global and national level), rising energy costs, restrictions on imports, improving education at all levels, soaring health care costs, changing family structure, managing the burden of government regulation, and the role of transportation.

Once business and community leaders, and educators recognize the major problems influencing growth and development, they can work together more effectively to overcome challenges. Recognition of the problem, however, must be followed with clear-cut solutions that are acceptable to the individuals and groups involved with the proposed outcome.

THE DEPARTMENT OF TRANSPORTATION GRIP SURVEY

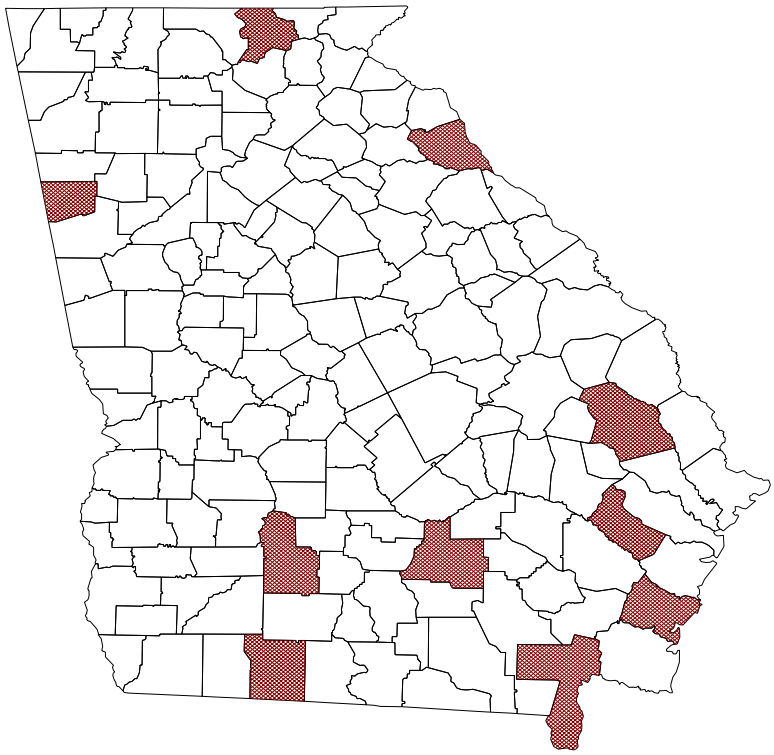
During the months of September and October of 1996, the Georgia Department of Transportation (GDOT) with the cooperation of the Association of County Commissioners of Georgia (ACCG) and consultation from the Georgia Municipal Association (GMA) conducted a survey to understand the importance the GRIP program has on local economies. Also assisting with the survey were the US 441 and US 27 Highway Associations. In 100 counties on or near a GRIP corridor, county commissioners and chamber of commerce officials received a questionnaire. Four questions were developed to identify the impact of economic development attributed to the GRIP highways. The questions asked to: 1) specify the GRIP corridor associated with the county, 2) list any businesses that located in the county because of the roadway, 3) pinpoint any businesses that has expanded because of GRIP, and 4) to indicate any businesses that did not locate in the county because the GRIP highway was not completed. Of the two-hundred surveys sent out, sixty-three surveys were returned for a response rate of 31.5 percent.

THE UNIVERSITY OF GEORGIA GRIP STUDY AREA

Because the GRIP system is still under construction, its total economic impact can not be determined. As a result, ten counties were selected to use as a basis for a more in-depth analysis. The counties chosen were Bulloch, Charlton, Coffee, Elbert, Glynn, Haralson, Long, Thomas, Union, and Worth (See Figure 4). As stated earlier, the study counties had to be nonmetropolitan, were located on a partially completed GRIP corridor, and returned the survey to the Department of Transportation.

Figure Four

GRIP STUDY AREA COUNTIES



U.G.A. GRIP STUDY COUNTY	*GRIP CORRIDOR*
Bulloch	US25/GA21
Charlton	US1/GA17
Coffee	US441
Elbert	US1/GA17,GA72
Glynn	US341,GA520
Haralson	US27
Long	US84
Thomas	US19.US319,US84
Union	GA515
Worth	GA520

ANALYSIS

The following variables were used for the analysis: total retail sales, total net digest, per capita income, transfer payments, total buying power by place of residence, unemployment, unemployment by race and sex These variables were chosen because they represent meaningful predictors of economic growth and development.

INTERPRETATION PROBLEMS

The economic analysis of new business or industrial development in rural areas creates a variety of different interpretation and methodological problems. For example, common sense would indicate that if a rural area had an increase in new job opportunities the unemployment rate would decrease, but numerous studies have documented that rural industrial development can be accompanied by increases in unemployment (Summers, 1976 and Killian, 1992). Unemployment increases for the following reasons. First, the possibility of employment in the home town slows the out-migration of working aged adults. Second, participation in the labor market increases. Third, the opening of job opportunities in one community often brings an influx of workers from the surrounding area. Fourth, the employment situation becomes more dynamic and some workers may be laid off as new jobs are created elsewhere.

A company that hires mostly women also can lead to increased unemployment rates. Women tend to drop in and drop out of the rural labor force more than men because of family responsibilities (Summers, 1976 and Killian, 1992). Thus, when a new industry comes to town, women who were previously NOT counted in the labor force take the new jobs. When they quit, they are counted as unemployed. As a result unemployment can increase despite the creation of new jobs. These and other interpretation and methodological problems suggest that "proving" the economic impact of a new developmental activity should be viewed with caution. Therefore, it is necessary to use a variety of different variables in the analysis.

RETAIL SALES

Retail sales was chosen as a study variable because it serves to measure the vitality of the local business climate. Increased retail sales, however, do not necessarily mean that local businesses are making greater profits because if competition outstrips increases in sales, profits may actually decrease. Nevertheless, retail sales provides a quantitative measure of the strength of the local economy.

The information in Figure 5a shows retail sales from 1985 to 1996 for the state, 42 metropolitan and 117 nonmetropolitan county averages, the ten county study area as a whole, and the individual study counties. The percent increase for the eleven year time period shows that the study area as a whole experienced a 109.4 percent increase in retail sales. All of the study area counties grew faster than the statewide average and the nonmetropolitan average except for Elbert County which only experienced a 12.1 percent increase in retail sales. All but two of the ten counties (Elbert and Long) exceeded the metropolitan averages for retail sales.

TOTAL NET DIGEST

Net property value was chosen as a study variable because gains in property values often signifies increases in wealth and aggregate personal income (Weisbrod and Weisbrod, 1997). Net digest is the value the tax assessor places on taxable property within the county. The figure, however, only represents forty percent of the actual property value.

The information in Figure 6a shows the total net digest for the same classifications as in Table 1 for the years 1985 through 1995. The percent increase for the six year period from 1990-1995 shows that the study area as a whole experienced a 29.0 percent increase in total net digest. During the period from 1985-1990, one of the ten counties (Union) exceeded the metropolitan average for percent increase in total net digest. Two of the ten counties (Bulloch and Union) exceeded the state average and four of the ten counties (Bulloch, Union, Coffee, and Haralson) surpassed the

nonmetropolitan average. During the period from 1990-1995, half of the ten counties (Bulloch, Union, Coffee, Elbert, and Haralson) surpassed the metropolitan, nonmetropolitan, and state averages for percent increase in total net digest.

PER CAPITA INCOME

Per capita income was chosen as a study variable because it is an indicator of overall economic vitality. Per capita income is the total personal income of the residents of an area divided by the resident population of that area. This indicator serves as an indicator of the quality of consumer markets and of the economic well-being of the residents of an area. However, per capita income often underestimates economic gains as it does not measure increased profits by local business. This measure, also, can vary widely from county to county and should be used with caution. For example, an area's per capita income can be influenced by the number of persons under the age of 16 or over the age of 65. These groups are not part of the workforce, yet they are included in the equation.

The information in Figure 7a shows per capita income from 1985 to 1995 for the same classifications as in the previous tables for the years 1985 through 1995, with the addition of figures for the Southeast and the Nation. The percent increase for the eleven year period shows that the study area as a whole experienced a 28.4 percent increase in per capita income. This increase exceeds the average percent increase in per capita income for the state, the Southeast, and the Nation. This increase in the ten county area also exceeds the average percent increase in per capita income for both metropolitan and nonmetropolitan county totals. All but three of the ten counties (Long, Charlton, and Elbert) experienced an increase in per capita income equaling or exceeding the state average, all but two of the ten counties (Long and Charlton) experienced an increase in per capita income exceeding the Southeastern average, and all but Long County experienced an increase in per capita income exceeding the national average. All but two of the ten counties (Long and Charlton) surpassed the average percent growth of per capita income for metropolitan counties, and five of the

ten counties (Union, Thomas, Coffee, Worth, and Glynn) surpassed the average percent growth of per capita income for nonmetropolitan counties.

TRANSFER PAYMENTS

Transfer payments was chosen as a study variable because it reflects the proportion of lower-income elderly persons, fatherless families, and those dependent on government assistance. Transfer payments are payments in which payments are made for services that are not rendered. These include retirement payments, AFDC, disability payments, unemployment insurance, food stamps, or direct relief. A high proportion of total personal income derived from transfer payments reflects a **LOW** degree of regional economic opportunities. The decrease in transfer payments in a community represents a positive economic benefit because it indicates a decline in traditional "welfare" and governmental assistance payments. It indicates that local economic opportunities have increased. A variety of different factors, however, influence the growth and distribution of transfer payments. These include changes in eligibility requirements, the out-migration of recipients, the immigration of retirees and the reduction in individuals receiving social security benefits and disability payments.

The information in Figure 8a shows the amount of transfer payments in thousands of dollars for the same classifications as in the previous table for the years 1988 through 1995. Six of the ten study area counties (Bulloch, Glynn, Worth, Thomas, Haralson, and Elbert) increased in transfer payments at a rate lower than both the metropolitan total as well as the state average for the years 1988-1995. Four of the ten study area counties (Glynn, Worth, Thomas, and Elbert) increased in transfer payments at a rate lower than the Southeast and 117 nonmetropolitan county total. One county (Thomas) increased in transfer payments at a rate lower than the national average for the years 1988-1995.

TOTAL UNEMPLOYMENT

Total unemployment and the unemployment rate were chosen as study variables because they illustrate the level of economic opportunities in a community as well as the strength of the labor market. Lower unemployment rates often reflect increased job growth, but as stated earlier, this figure must be used with caution. The information in Figure 9a shows the labor force, the total unemployed, and the unemployment rate for the years 1985, 1990, and 1995 for the same classifications as in the previous tables, without figures for the Nation and the Southeast. It also shows the percent change in total unemployed between 1985-1996 and 1990-1996. Between 1985 and 1996, the average percent change in total unemployed for the ten county study area was -25.6 percent, a percent change in total unemployment greater than for the state, 42 metropolitan and 117 nonmetropolitan county averages. In the period from 1985-1996, all but three of the ten county study region (Charlton, Union, and Coffee) experienced a greater decrease in total unemployment than the state average for that period. For the period between 1985-1996, all but two of the ten study counties (Charlton and Union) experienced a greater decrease in total unemployment than the metropolitan average for Georgia. Furthermore, between 1985 and 1996, five counties of the ten study counties (Thomas, Glynn, Long, Worth, and Bulloch) experienced a greater decrease in total unemployment than the nonmetropolitan average.

UNEMPLOYMENT BY RACE AND SEX

Unemployment by race and sex was used as a study variable for two reasons. One, increased female participation in the work force often leads to increases in local wealth (Summers, 1976 and Killian, 1992). Second, economic growth that does not impact historically underprivileged groups is not as desirable as economic growth that does. If economic growth does not reach out to all members of the community, it may lead to increased social tension and decreased quality of life as resentments increase.

The information in Figure 10a shows the unemployment rates by race and sex for the years 1988 and 1996, as well as the percent change between the two periods for the

same classifications as in the previous table. Between 1988-1996, the unemployment rate for females decreased by 30.4 percent, a rate greater than the state, metropolitan, and nonmetropolitan average. All but four counties (Elbert, Union, Haralson, and Charlton) had a greater percent decrease in unemployment than the metropolitan average percent decrease in unemployment for females. All but three counties (Elbert, Union, and Haralson) had a greater percent decrease in unemployment than the statewide average percent decrease in unemployment for females. All but two counties (Haralson and Union) had a greater percent decrease in unemployment than the nonmetropolitan average percent decrease in unemployment for females.

Between 1996 and 1988, the unemployment rate for African-Americans fell by 15.5 percent in the ten county study area. During the same time, the statewide average percent decrease in unemployment rate was 13.4 percent, whereas the nonmetropolitan average unemployment rate for blacks actually increased by 3.9 percent. Five counties (Long, Thomas, Worth, Bulloch, and Haralson) of the study area experienced a greater decrease than the metropolitan average percent decrease in unemployment for African Americans. Six counties (Long, Thomas, Worth, Bulloch, Haralson, and Charlton) of the study area experienced a greater decrease than the statewide average percent decrease in unemployment for African Americans. All but Elbert County experienced either a decrease or a smaller increase than the nonmetropolitan average percent increase in unemployment for African-Americans.

TOTAL BUYING POWER

Total buying power was chosen as a study variable because it provides a quantitative indication of economic markets. Total buying power is calculated by summing the disposable personal income of all the residents of a certain geographic region (Humphreys, 1997).

The information in Figure 11a shows the total buying power by place of residence for 1990 through 1997, for the same classifications as in the previous table. It also presents the percent change in total buying power between 1997 and 1990. Between

1997 and 1990, the percent change in total buying power of the ten county study region was 54.73 percent, which was greater than the percent change for the state, metropolitan counties and nonmetropolitan counties. Six counties of the ten counties in the study region (Union, Worth, Coffee, Thomas, Bulloch, and Long) exceeded the state, metropolitan, and nonmetropolitan percent change in total buying power.

CONCLUSION

The ten county analysis indicates that the GRIP study area has shown overall economic growth. In addition, the study area has experienced a larger amount of growth on a percentage basis than the nonmetropolitan total and in some cases the metropolitan and state average as well. Because economic growth does not occur in a vacuum, and a host of global, national, state, regional and economic, social, and demographic trends are also occurring in the study area, all of the documented increases shown in tables 5 through 11 can not solely be attributed to the GRIP.

Positive economic growth has occured in the study area. Seven different economic growth indicators used to measure the impact of economic development, indicate that the GRIP system has had a positive impact on economic growth in the ten counties. Economic development is not the net result of highway improvements. It involves a variety of different collective endeavors which bring about the growth of jobs and income. Whether the growth is the result of the creation of new jobs or through the expansion of existing industries, the bottom line remains the same. Without the ability to move goods, services, or labor in a cost effective manner into and out of a community, economic development will not occur. This conclusion has been reached and replicated by numerous studies of industrial location decision makers. In the current environment of rapid technological change and growth of computer technology, the development of a sound transportation system represents a viable economic development strategy for both rural and urban Georgia. Additional research measuring the economic impact of the GRIP system may reveal even larger gains as the completed system begins to influence regional growth.

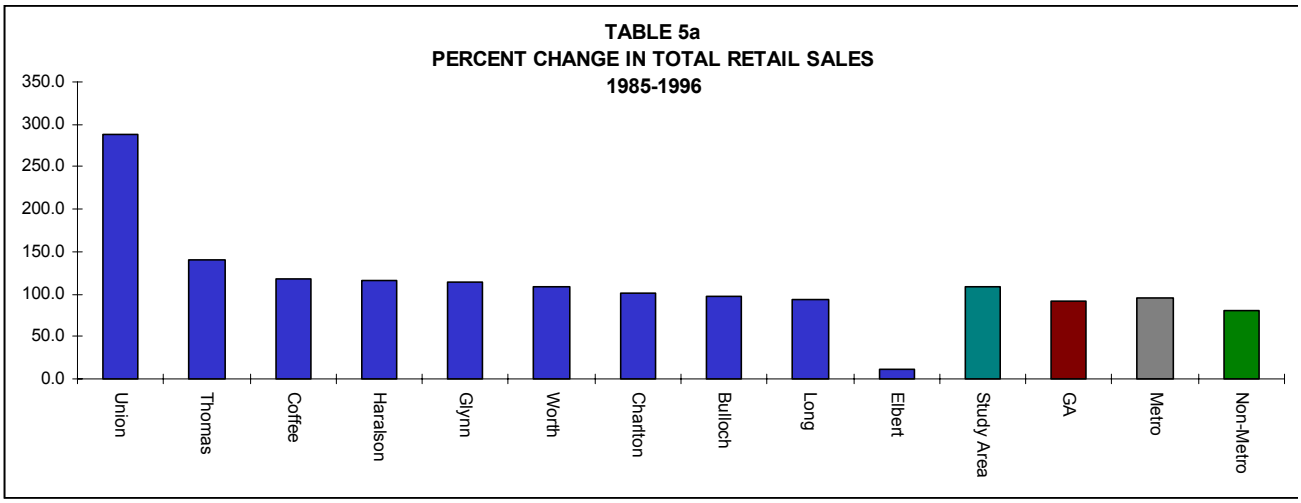


TABLE 5a
PERCENT CHANGE IN TOTAL RETAIL SALES
1985-1996
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
Union
Thomas
Coffee
Haralson
Glynn
Worth
Charlton
Bulloch
Long
Elbert
Study Area
GA
Metro
Non-Metro

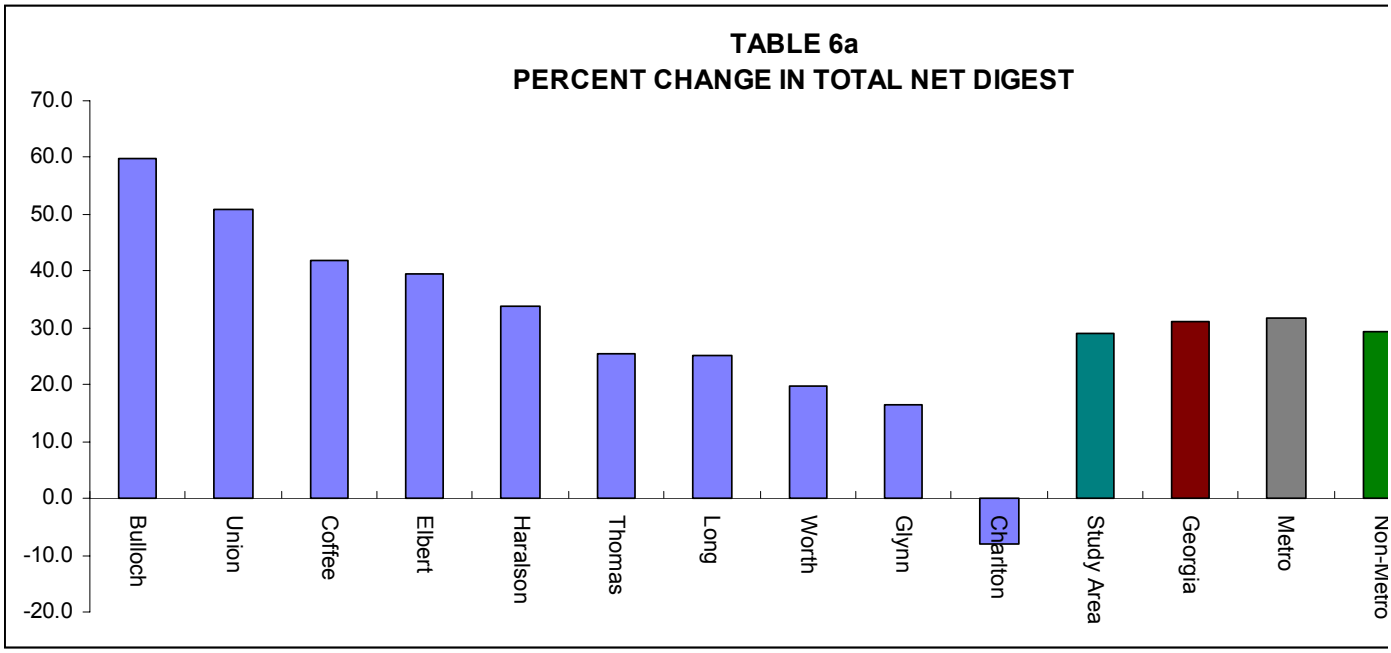


TABLE 6a
PERCENT CHANGE IN TOTAL NET DIGEST
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
-10.0
-20.0
Bulloch
Union
Coffee
Elbert
Haralson
Thomas
Long
Worth
Glynn
Charlton
Study Area
Georgia
Metro
Non-Metro

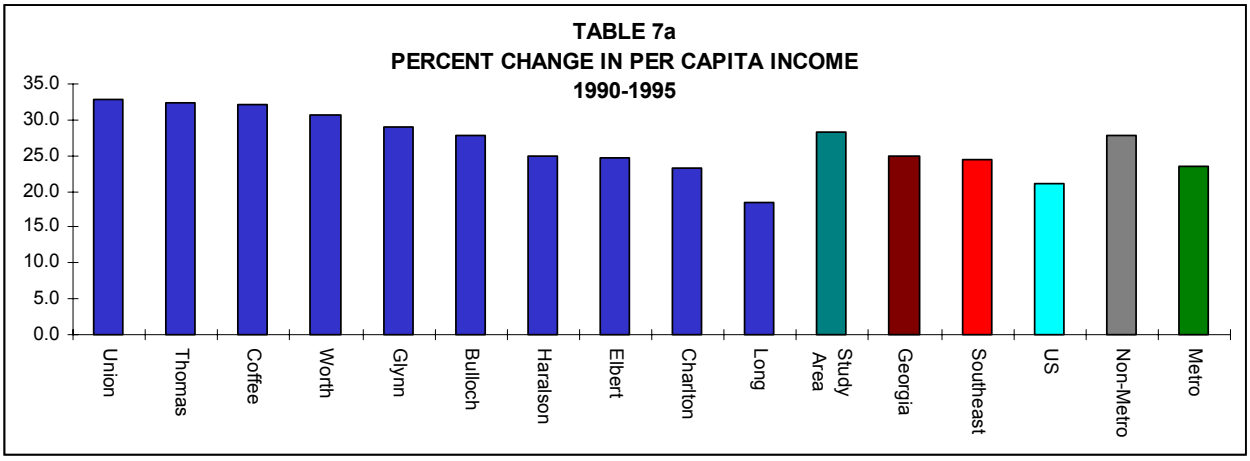


TABLE 7a
PERCENT CHANGE IN PER CAPITA INCOME
1990-1995
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Union
Thomas
Coffee
Worth
Glynn
Bulloch
Haralson
Elbert
Charlton
Long
Study Area
Georgia
Southeast
US
Non-Metro
Metro

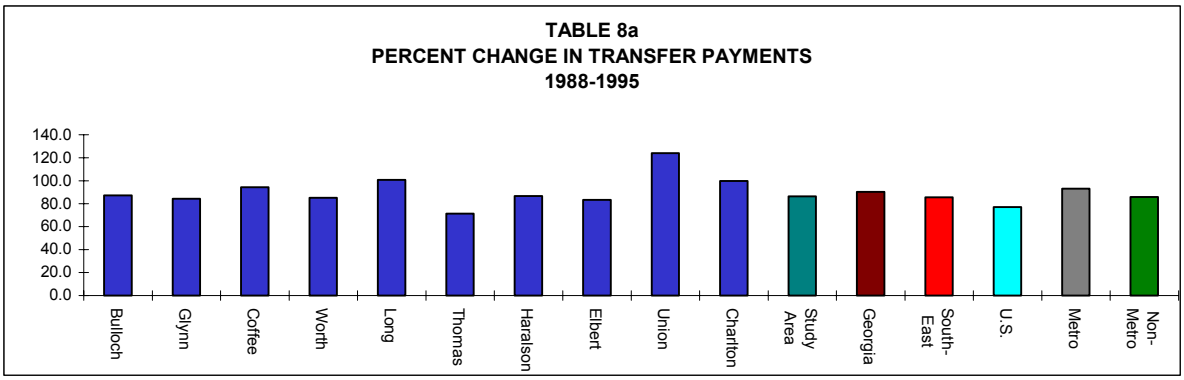


TABLE 8a
PERCENT CHANGE IN TRANSFER PAYMENTS
1988-1995
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Bulloch
Glynn
Coffee
Worth
Long
Thomas
Haralson
Elbert
Union
Charlton
Study Area
Georgia
South-East
U.S.
Metro
Non-Metro

FIGURE 9a
PERCENT CHANGE IN TOTAL UNEMPLOYMENT
1985-1996

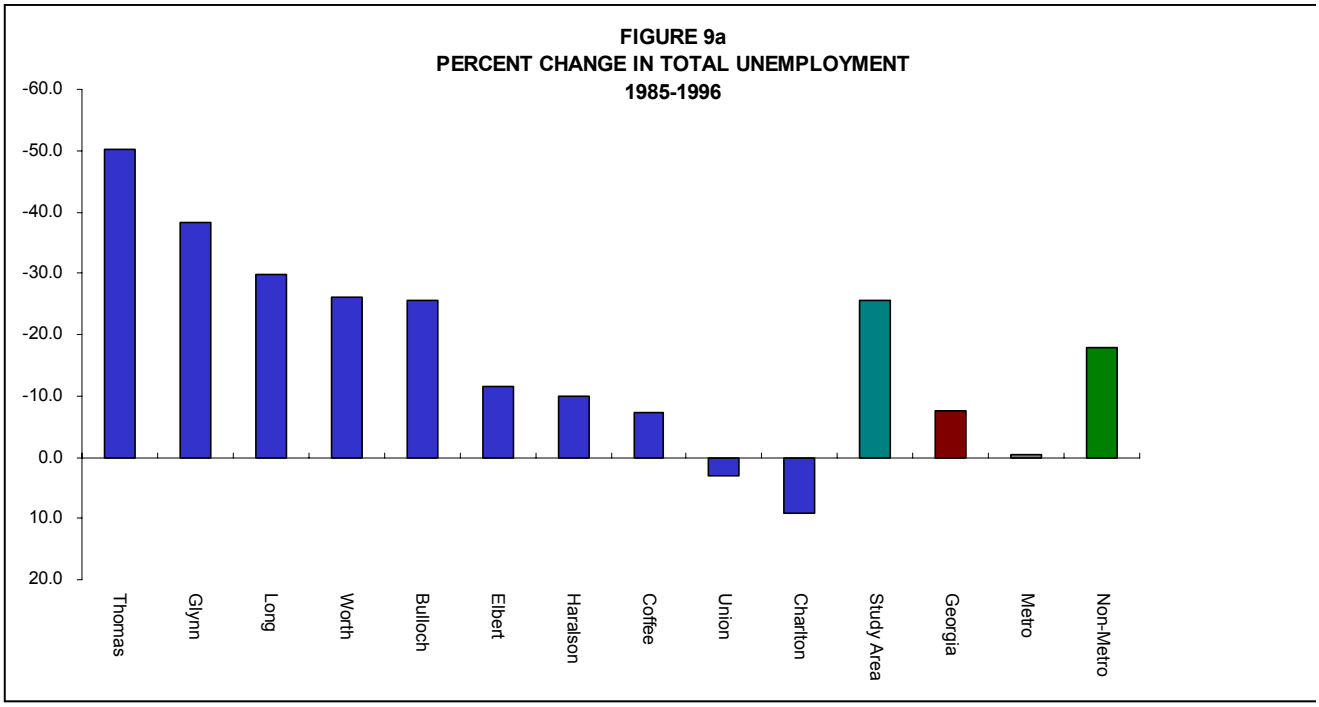


TABLE 10a
PERCENT CHANGE IN UNEMPLOYMENT RATE BY RACE AND SEX
1988-1996

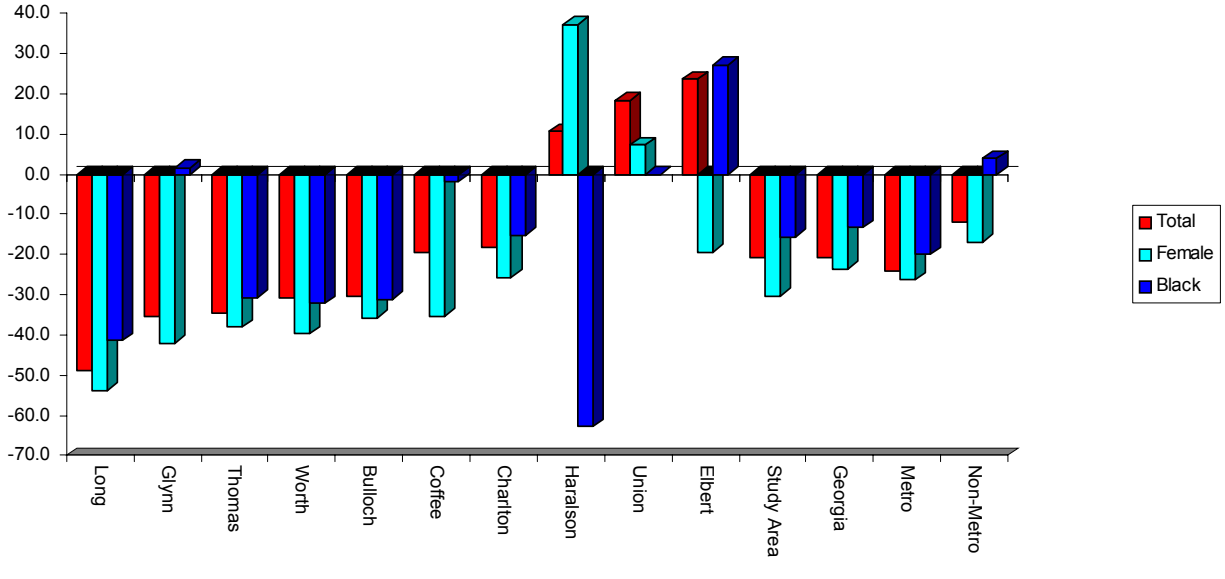


TABLE 11a
PERCENT CHANGE IN TOTAL BUYING POWER
BY PLACE OF RESIDENCE:1990-1997