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MEMO TO: J. R. Harbison
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SUBJECT: Research Report No. 388; "'Before' Evaluation of Economic Growth Center Developmental Highway (US 25E: Corbin-Barbourville); KYP-73-42; HPR-1(9), Part III.

US 25E between Corbin and Barbourville was constructed as a then-modern highway in 1928. US 25 from Lexington to Corbin had been fully paved by 1925. The historic Wilderness Road had bypassed Corbin via present KY 229. US 25E was the preferred route to Knoxville until the late 1930's. Corbin became prominent when the L & N shops and yards were moved there from Livingston in the early 1900's. The L & N was extended up the Cumberland Valley from Corbin to Middlesboro, when Middlesboro became a "boom town", and later to the Harlan coal fields. Truck and bus lines did not emerge until the early 1930's. Railway passenger service through Barbourville was discontinued after World War II; north-south passenger service through London and Corbin continued until the 1960's. The years between 1924 and 1934 were, in fact, a great road-building era in Kentucky. For purposes such as this study, it seems somewhat necessary to reference time from that era. It was, in fact, the beginning of the first generation of modern highways. Now, it seems appropriate to speak of second-generation highways. First-generation highways were overshadowed by the great economic depression of the 1930's.

The second generation of highways in Eastern Kentucky began generally with the Mountain Parkway and merged into the Appalachian Highways Program. The interim period before and after World War II was characterized first by WPA road programs and farm-to-market roads. A very singular development was the consolidated school systems. The present Rural Highway Program began after World War II.

I 75 might be regarded as a third-generation highway inasmuch as US 25 from Lexington southward had undergone almost complete reconstruction, widening, and improvements from the late 1930's through the early 1950's.

Originally, US 25 and US 25E went through the middle of each town. Traffic congestion became overwhelming. Only Barbourville and Williamsburg had bypass routes prior to the Interstate System.

For many years there was a KY 229 Development Association which strongly advocated improvement of that leg of the London-Corbin-Barbourville triangle. It appears now that the completion of the US 25E connector to I 75, north of Corbin, together with current improvements and eventual completion of new US 25E, has decided the issue.

The imminent completion of the Daniel Boone Parkway from London to Hazard and improvement of KY 80 connecting with the Cumberland Parkway at Somerset will make London the principal hub of highways in the area.

Of the three towns, Barbourville is most dependent on US 25E and, of course, is the development center chosen for this study. It seemed desirable to consider Corbin and London in the study area in order to obtain apparent interactions and comparisons of economic impact indicators. It is anticipated that the first recognizable impact will be the development of a new generation of highway-oriented businesses in the new US 25E corridor.

The "after" period cannot really begin until the remaining five miles in the vicinity of Gray are also reconstructed.

A companion study is being made of Campbellsville. A "before" report will be forthcoming in the next few months. Also, a "before and after" study of the Mountain Parkway corridor has begun on an exploratory basis.

Respectfully submitted,

Jas. H. Havens
Director of Research

JHH:gd
Attachment
CC's: Research Committee

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16. Abstract

Before-and-after impact studies were selected as the means of determining the effect of reconstructing a 4.886 mile (7.862 kilometer) section of US 25E between Corbin and Barbourville. A comprehensive analysis of the "before" statistics revealed the area designated as a potential growth center suffered from social and economic mediocrity. Many characteristics considered essential for economic prosperity are lacking. Per capita income and educational achievement levels are lower than statewide averages. Transportation is dependent upon highways and many existing routes provide a very low level of service.

On the other hand, the area has adequate industrial and recreational potential to insure economic growth when the appropriate factors are combined. It was hypothesized that reconstruction of the section of highway would encourage economic growth and provide a general upgrading of the standard of living in the area. This could be the first step in reversing the basic out-migration problem and would, in the long run, create a means for encouraging a more balanced population pattern in the urbanized sections of the nation.

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"BEFORE" EVALUATION OF ECONOMIC GROWTH CENTER DEVELOPMENTAL HIGHWAY

(US 25E: Corbin - Barbourville)

KYP-73-42, HPR-1(9), Part III

by

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INTRODUCTION

Previous studies have indicated the economic growth of an area is directly related to available transportation facilities *(1,2,3)*. Inadequate accessibility to a potentially prosperous area can reduce chances for acquiring new industry or attracting tourists. Without adequate access to the area for industry, tourists, or commuters, the economy of an area will subsequently revert mainly to small family businesses, subsistence-type activities, or one large industry.

Unpromising economic conditions greatly encourage out-migration of a major resource for the future, the young people of the area. The phenomenon is most evident throughout the Appalachian region of the eastern United States. Desertion of the home area is understandable. Simply stated, not enough good employment possibilities exist for people of the communities; hence, basic economics motivate migration to other areas.

Since a large percentage of those who migrate belong in the younger age group, a severe dilemma appears. With the departure of talented and ambitious young go prospects of business investment that could encourage growth; thus, the youth's educational, technological, and innovative skills, potentially beneficial to the area, are transferred elsewhere. New investment, the most volatile and necessary component of community income, is thwarted by the out-migration process and likelihood of adequate employment facilities diminishes.

As investment declines, so does community income. Existing capital facilities eventually wear out, causing business productivity to be impaired. As production (capital) declines, employees must be suspended and community income declines. Drop in community income is a multiple of decline in investment. As income drops, less money is in circulation to buy goods and services. With less demanded, sales volumes are lower and lead to a further drop in income and a rise in unemployment rate. As more people migrate away, investments in new business ventures and capital equipment decline. Eventually, employment and population tend to stabilize at a level well below optimum economic conditions.

It is easily understood that some incentive is necessary to ignite such a stalemated economy to start it moving once again. One stimulus could be a modern highway. This is not to imply that a new highway is the only major component of investment which will stimulate development. Economic potential, whether it be in the form of adequate manpower, tourist attractions, water and land facilities for industry, or valuable natural resources, must exist prior to a highway's improvement before any growth may be anticipated. This study was based on the hypothesis that highway construction and highway-induced development leads to economic growth within an area if other important factors exist. Therefore, a new highway may ignite other dormant factors to promote community and area development.

A section of US 25E between Corbin and Barbourville was selected as a potential "growth center" developmental highway. The area, though depressed in terms of per capita income and employment, has many resources available for growth.

The concept of the growth center has its legal and legislative basis in the form of the Federal-Aid Highway Act of 1970 (Public Law 91-605). An explanation of the growth centers purposes was provided by Section 143 of that act, a portion of which states:

> *a) In order to demonstrate the role that highways can play to promote the desirable development of the Nation's natural resources, to revitalize and diversify the economy of rural areas and smaller communities, to enhance and disperse industrial growth, to encourage more balanced population patterns, to check, and, where possible, to reverse current migratory trends from rural areas and smaller communities, and to improve living conditions and the quality of the environment, the Secretary (of Transportation) is authorized to make grants to States for demonstration projects for the construction, reconstruction, and improvement of development highways on the Federal-Aid primary system, to serve and promote the development of economic growth centers and surrounding areas, encourage the location of business and industry in rural areas, facilitate the mobility of labor in sparsely populated areas, and provide rural citizens with improved highways to such public and private services as health care, recreation, employment, education, and cultural activities or otherwise encourage the social and economic development of rural communities, and for planning, surveys, and investigations in connection therewith.*

In order to qualify as a growth center project, an area must meet several criteria: (1) apparent and strong economic potential must exist; (2) approval by the Secretary (of the U.S. Department of Transportation) given on the basis of recommendations of the governors of the states, or by the Economic Development Administration, the regional development commission,

or by state planning, development, or similar agencies; (3) a growth center could include a central city or town and contiguous incorporated places; (4) a growth center must have identifiable boundaries, preferably such as a political and(or) a physical boundary; and (5) the growth center must have a population of under 100,000.

The growth center idea embraces a different theory of economic development than the traditional concept. While the problem of population distribution remains a national dilemma, the concept of growth center may reduce the problem, or at least keep it from affecting less populated regions of the United States. Growth centers involve rural development itself. That is, the growth center concept refutes the principle that an area cannot be economically prosperous unless it is heavily populated, heavily industrialized, and heavily traveled. The development of rural areas entails greater numbers of social and private services, easier travel amd accessibility within the area and to other areas, and a general increase in purchasing power and betterment of life style throughout the region.

By encouraging development within rural areas, the regional problem of concentrated population may be alleviated. Congestion and other problems associated with cities would be arrested to some extent if development occurred in rural areas. In effect, evenly distributed development and population increases are highly essential in the nation's future, for quite understandable reasons.

The objective of this study was to quantify the degree of relationship between highway development and improvement in the socio-economic well-being of an area as a result of reconstruction of a 4.886 mile section of US 25E between Corbin and Barbourville in Knox County (Figure 1). This report is a study of the social and economic conditions of the tri-county area (Knox, Laurel, Whitley) through 1970. The general area is shown in Figure 2. It includes a survey of various social, educational, health, and labor statistics. Some projections are included. The report is a "before" study. That is, all data pertaining to the analysis of the target area were taken from years before construction of the new US 25E.

Several benefits may be forthcoming from the improvement of US 25E between Corbin and Barbourville. First, there is great potential for growth which the roadway may stimulate. Water, natural resources, land sites for industry, recreational and tourists facilities, and manpower are all in abundant quantities in the target area. Accessibility to the growth center will definitely enhance chances for growth.

Secondly, a modern US 25E from Corbin would provide an interconnection with Kentucky's Appalachian Highway System. Added justification is provided for the inclusion of this project as a demonstration development highway in that Corbin is the primary trading center for this area.

Third, the section of US 25E around Gray is the last remaining section from Corbin to Barbourville which has not been improved. This is one of the most needed highway projects, as it would not only provide adequate highway service to the Barbourville growth center but also a traffic corridor to a number of growing communities and recreational areas in Central Kentucky.

Fourth, a new US 25E may be the catalyst for total growth, basically because of new industrial expansion into the area. This will in turn reverse the trend of out-migration while revitalizing and diversifying local economies of the area.

Scope

This report is concerned with the construction of US 25E from Corbin to Barbourville, specifically, a section of 4.886 miles (7.863 kilometers) extending from 5.3 miles (8.530 kilometers) west of Barbourville to 0.1 mile (0.161 kilometers) west of Gray. This section will provide the Corbin-Barbourville area with an improved transportation facility.

The areas which are most likely to be stimulated economically are Knox and Laurel Counties, plus the Corbin area of Whitley County. Corbin, London, and Barbourville are closely connected communities whose common highway linkage is US 25. The three communities form a triangle for development. Corbin and London are connected by US 25 and I 75; Corbin and Barbourville by US 25E; and London and Barbourville by KY 229. While Corbin and London are fast becoming one single community, Barbourville, through the help of the new road, is expected to join the substantial growth under way in the other two cities. Since the completion of I 75, economics of Corbin and London have changed dramatically for the better.

Limitations

The report is limited by lack of relevant data in several important categories, especially investment figures. The basic constraint was the unavailability of necessary information on both the county and city levels.

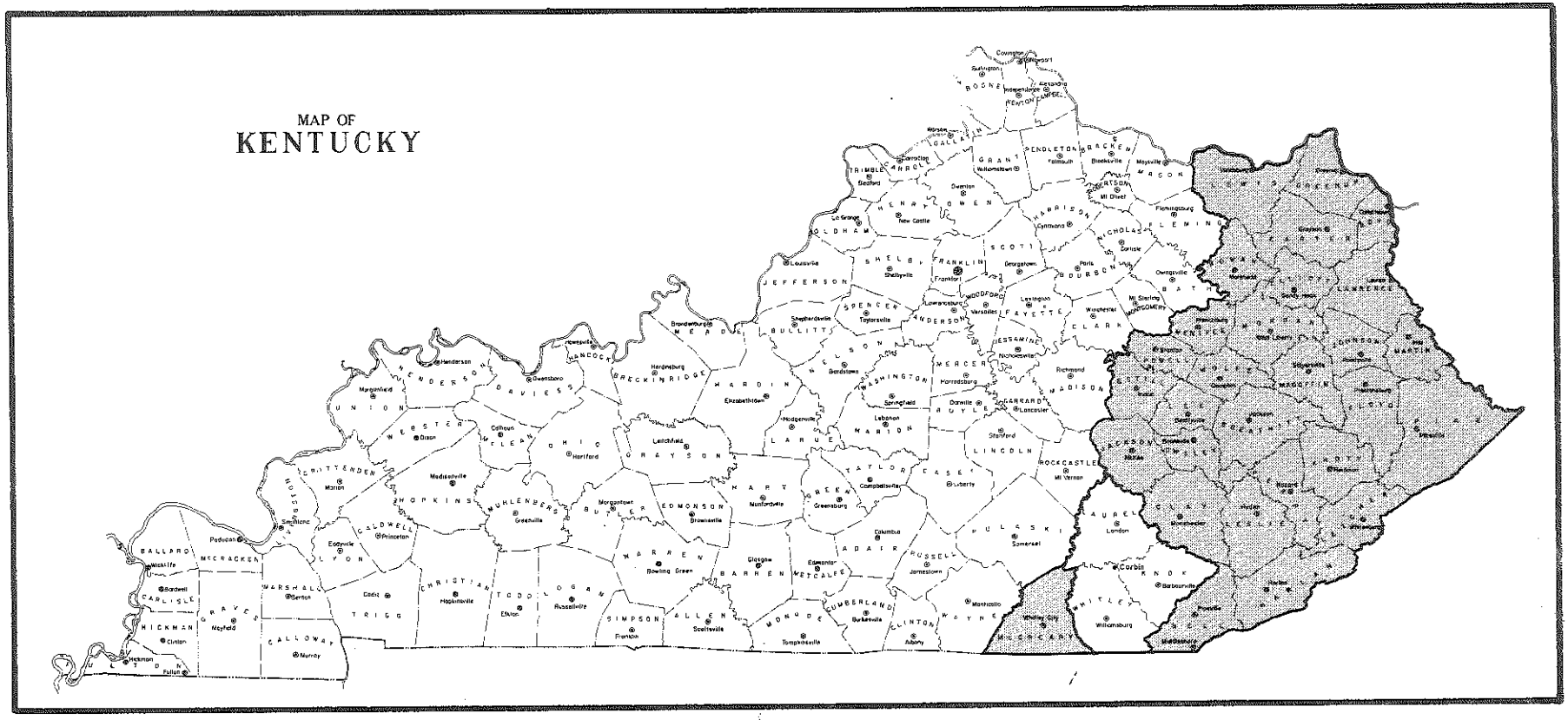

Figure 1. **Study Area (Laurel, Knox, and Whitley, Counties) within the Appalachian Region of Kentucky.**

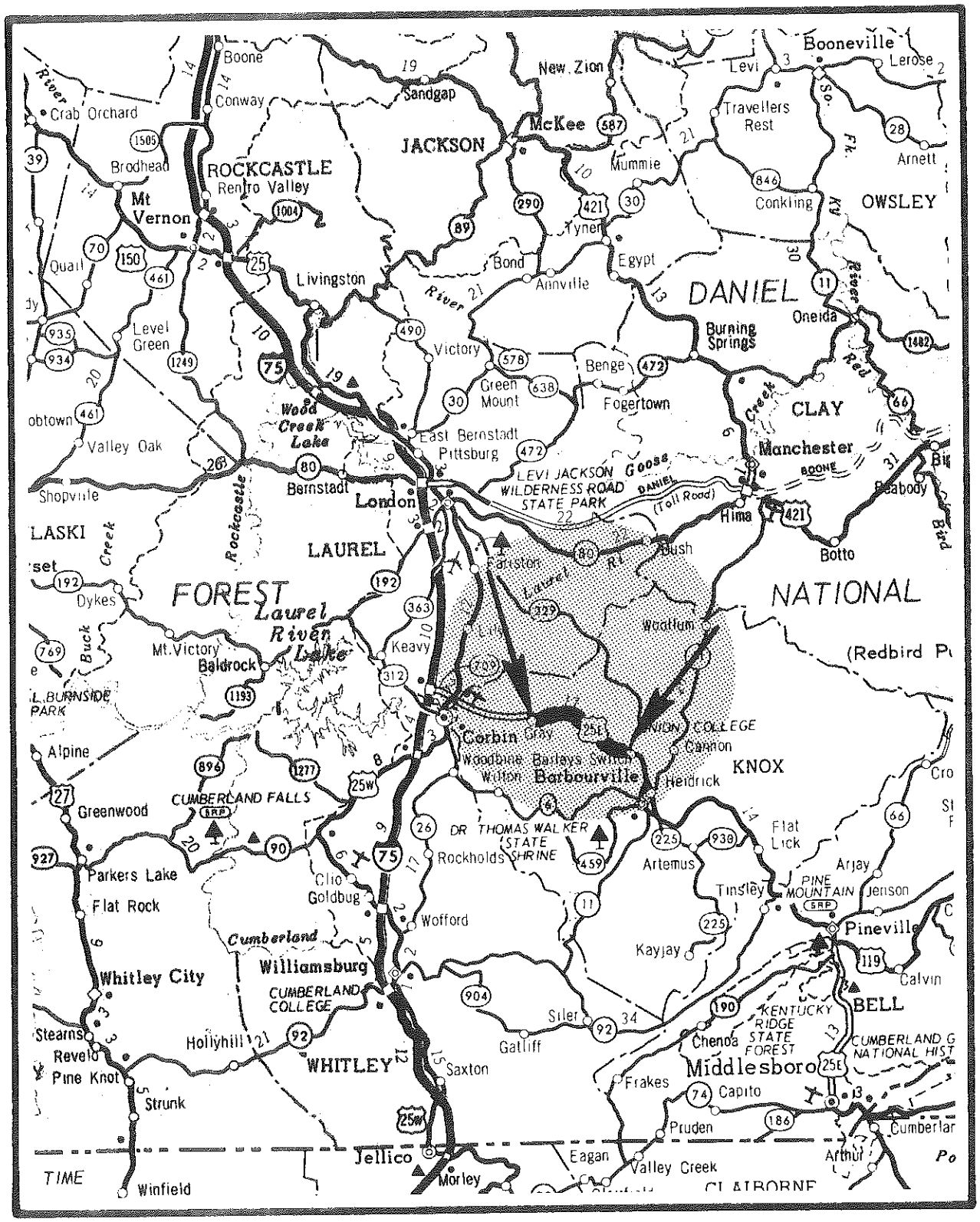

Figure 2. **Economic Growth Center Developmental Highway (4.886 miles (7.862 kilometers) of US 25E between Corbin and Barbourville.**

Procedure

Data were collected from various agencies of state government, including the Office for Local Governments, the Department of Commerce, Department of Economic Security, Department of Education, Department of Parks, The Cumberland Valley Area Development District, and the Bureau of Highways. Likewise, much data were obtained from census reports, ranging from 1930 to 1970. Commuting data were obtained by a simple questionnaire sent to the personnel managers of five moderately large industries within the area.

After the data were collected and assembled, a trend-line analysis by the method of least squares was employed for all prediction procedures. Predictions were made for 1980.

A comparison of actual versus predicted values will be made in the "after" study of the same target area. If actual growth rates in most of the categories are found to be greater than predicted values, it will be hypothesized that the improved US 25E route was an influencing factor in stimulating economic development.

Definitions

1. Economic growth center developmental highway - a highway on the Federal-aid primary system which meets requirements established by Section 143 of the Federal-Aid Highway Act of 1970 and is approved by the Secretary of Transportation for construction, reconstruction, or improvement under provisions of that section.

2. Target area -- the areas (Knox, Laurel, and Whitley Counties) where the growth center highway may exert significant influence, socio-economic or otherwise.

3. Growth center -- the Corbin-Barbourville area; also, the term may include the London city region.

4. Commuting range -- refers to the ability of residents of rural counties to commute daily with reasonable convenience to work opportunities in the growth center, and to commute there for medical, educational, recreational, and other services.

5. Economic development -- in the strict sense, a substantial long-term rise in per capita income throughout an area or a county; more commonly, a long-term increase in per capita income, industrial technology, educational services, medical facilities, employment opportunities, labor force participation, value of production, and general standard of living for people within a region or county.

6. Public and private services -- health care, transportation, education, legal, employment, recreation, cultural activities, and other services available to the public.

ECONOMIC BASIS OF EXPECTED GROWTH

The target area is located in the heart of the Cumberland Valley Area Development District, an entity that encompasses eight counties in Southeastern Kentucky. Though still underdeveloped in many respects, the target area has adequate potential for continued development. Several factors acting as components of growth exist in abundance. Providing access to the area and making growth components available and accessible to industry will help to insure prosperity for the area.

First, the available industrial potential appears promising for business expansion. Laurel County and Corbin have several suitable sites for industrial factories and plants and Barbourville has perhaps a single site. Corbin and London are working jointly on a project involving procurement of several hundred acres which will ultimately form an industrial park.

An adequate labor force is available, even though manufacturing employment is relatively high in the area. Questionnaires concerning availability of a labor force for possible factories have continuously received favorable response. This positive attitude towards industry by people of the area might very well be indicative of the final stage of metamorphosis from a basic agrarian economy toward one where both small businesses and large industry not related to agriculture stimulate further investment.

The livability factor of a region is always an important index as to whether people will remain or move to a particular environment. Once again, the outlook is relatively good here. All three cities have access to a major state park (Barbourville -- Dr. Thomas Walker, London -- Levi Jackson, and Corbin -- Cumberland Falls) and other excellent recreation facilities for their citizens. Since this is a relatively religious section of the United States, the influence of several denominations is strong. The region has a church-supported college in each of its three counties (Knox -- Union College, Laurel -- Sue Bennett Junior College, and Whitley -- Cumberland College). Local industrial leaders are very concerned that only non-polluting or low-polluting industries are allowed in the region to protect the total environment.

Industry is genuinely interested in locating in the target area for the cited reasons. A more detailed description of each section of the area in terms of industrial potential follows.

Corbin

Corbin, a small town of 7,500 people, lies approximately 17 miles (27 kilometers) west of Barbourville. It has shown significant industrial progress in the past several years. Major industries which located in Corbin in the 1960's include American Greeting Corporation; Corbin Textiles, Incorporated; Elicon Corbin, Incorporated; and National Standard Company. The city's chances for continued industrial development will be enhanced significantly by the new section of US 25E. Because of the relatively high rate of unemployment in Knox County, Corbin will be provided with an increased supply of unskilled and semiskilled workers for prospective new businesses. US 25E will likely induce commuting of workers from Barbourville and surrounding Knox County to Corbin, a location in which many industries have shown interest.

Most new industry for Corbin is being planned by the Corbin-London Laurel County Industrial Authority. This group is presently in the process of negotiating purchase of 700-800 acres (283 x 10^4 - 324 x 10^4 m^2) in Fariston (a community southeast of London) and also 400-500 acres (162 x 10^4 - 202 x 10^4 m^2) around the Lily community (just north of Corbin).

Both areas offer excellent possibilities for plant sites. Both have access to the L&N Railroad tracks and north-south (I 75) and east-west (US 25E and the Daniel Boone Parkway) highways. Additionally, both sites are near the London-Corbin War Memorial Airport, a facility situated nine miles (14.5 kilometers) north of Corbin. The airport can support both propeller-driven and jet-type airline traffic. The Kentucky Utilities Company is capable of providing electrical power for these sites. These two tracts do have some drawbacks, the major one being difficulty in acquiring the land. The Industrial Authority desires to purchase many small plots in order to gain control of an area large enough for an industrial park. Until the land owners consent to sell, industrial leaders do not possess sufficient land for an industrial park complex.

The second major impediment to the development is the unavailability of water and sewerage facilities. The cost of installing both water and sewerage lines for one additional factory would be highly uneconomical for a city unless revenue generated from employment or social benefits to the community are substantial. However, if numerous factories desire to move to Corbin, the Corbin-London-Laurel County Industrial Authority might decide on one particular set of closely-connected sites to relieve the cost burden for water and sewerage installation. For this reason, Corbin has gone almost completely to the industrial park concept.

At present, Corbin has two reasonably good industrial sites *(4)*. Site 1 is a 40-acre (16 x 10^4 m^2) tract located 4 miles (6.4 kilometers) north of Corbin and 2.5 miles (4.0 kilometers) northeast of the I 75 interchange in North Corbin. It is owned by the First National Bank of Corbin. The site is very attractive to industry for several reasons: (1) it has close proximity with the L&N Railroad; (2) it has a 12-inch (30.5-cm) water line with the Corbin City Utilities Commission (CCUC) on the site; (3) gas lines are already provided by Peoples Gas Company of Corbin; (4) electricity is furnished by Kentucky Utilities; (5) sewerage lines are present, having been installed by the CCUC.

Site 2 is a 90-acre (36 x 10^4 -m^2) tract located 3 miles (4.8 kilometers) north of Corbin and $1\frac{1}{2}$ miles (2.4 kilometers) northeast of the I 75 exchange in North Corbin. It is not served by rail but has access to two highways, US 25E (3/4 mile (1.2 kilometers) south) and KY 1223 (on the southwestern edge of the tract). A CCUC 12-inch (30.5-cm) water line exists. Peoples Gas Company has installed a 4-inch (10.2-cm) main on the site. Kentucky Utilities will provide electrical service. Sewage lines are already provided by the Corbin City Utilities Commission.

Corbin's industrial potential is further evidenced by the under-utilization of its existing water and sewerage facilities. While the Corbin water treatment plant's daily capacity is 5,000,000 gallons (18927 m^3), average daily consumption is around 1,000,000 gallons (3785 m^3), with a peak daily consumption of only 1,600,000 gallons (6057 m^3). Storage capacity is approximately 2,850,000 gallons (10788 m^3). Water mains are 4, 6, 8, 10, and 12 inches (10.2, 15.2, 20.3, 25.4, and 30.5 cm) in diameter. The City Utilities Commission treatment facility has a design capacity of 2.5 million gallons per day (0.110 m^3/s). The average daily flow amounts to approximately 0.9 million gallons (3.41 x 10^{-3} m^3). Corbin has capabilities to serve industry *(5)*.

London

London (population 4,500) undoubtedly has the greatest opportunity for economic development in the target area. The entire Laurel County area has excellent accessibility with most other regions of the state. Interstate 75 (north-south) and the Daniel Boone Parkway (east-west) promote efficient transportation. Moreover, the London-Corbin War Memorial Airport provides passenger and cargo air transportation to and from the area.

Besides locational advantages, London has several potential sites for industry *(6)*. Site 1 is located behind the Cardinal Motel, approximately 2 miles (3.2 kilometers) south of downtown London. The site has no rail service and no access road. However, the land is level and usable. Gas lines are already in the area.

Sewage and water lines (12-inch (30.5 - cm)) are presently being constructed for this project.

Site 2 consists of 41 (16.6 x 10^4 m^2) acres behind the recently completed Daniel Boone Parkway in East London. Even though this site has gas, sewerage, water, and electricity, two limitations of the site must be mentioned. First, the terrain of the site is rolling. Of the total acreage, only about 25 acres (10 x 10^4 m^2) could be graded for an industrial site. Second, there is no access road to the Daniel Boone Parkway. An access road must be provided before serious consideration can be given to the land development.

The third potential industrial site shows the greatest promise of all. It is located on KY 1006 behind the London-Corbin War Memorial Airport. The site consists of 68 acres (28 x 10^4 m^2), but some of the land may be acquired by the airport for expansion. Nevertheless, when water and sewage lines are completed, this site would be excellent for both efficient highway and airline access to all areas of the region.

Barbourville

Barbourville (population 3,500) possesses fewer locational advantages or economic growth potentials than Corbin or London. This is not to imply the city is economically sterile. It must be noted the other two towns have a great deal more to offer in terms of transportation and adequate sites for industry.

First, Barbourville is somewhat isolated in comparison with the other cities in the target area. Corbin and London, both situated on I 75, have an enormous strategic plus for industry's distribution of its goods and services. Corbin and London receive many north-south travelers in their motels, restaurants, and service stations, an advantage which provides the local economies with substantial income. This is not true in Barbourville. While Barbourville does receive some degree of east-west traffic on US 25E, it is not nearly as heavily traveled as I 75. It appears Barbourville faces a serious problem of isolation.

Secondly, although there is a relative abundance of flat land in the Barbourville area, especially on the western outskirts, it is unfit for industrial consideration because the land is nearly all low-lying tracts which frequently flood. For this reason, the community and industrial leaders have found it difficult to obtain acceptable tracts *(7)*.

Finally, Barbourville's water facilities may be operating at full capacity in the near future. Barbourville's treatment plant capacity is approximately 750,000 gallons per day (0.033 m^3/s), while average daily consumption is 500,000 gallons (1.89 x 10^{-3} m^3) (peak daily consumption is 550,000 gallons (2.08 x 10^{-3} m^3)). Storage capacity is 800,000 gallons (3.03 x 10^{-3} m^3). The Tremco Corporation, a new industrial plant presently in the latter stages of construction, will eventually produce sealants and sealant tapes. The manufacturing process will require an enormous quantity of water for operation, a quantity that will likely push the city's supply to its capacity. Unless new facilities are planned, the likelihood of Barbourville's being able to accommodate new plants in the future appears questionable. Since the facilities are already pumping 16 to 17 hours per day, a new industry such as Tremco will require continuous operation of the water plants.

At present, the Knoxco Improvement Company (Knox County's industrial development council) has only one industrial site, a 25.74 (10.42 x 10^4 m^2) acre tract adjacent to the Cumberland Valley RECC on US 25E and 6.5 miles (10.5 kilometers) northwest of Barbourville. The only highway access is US 25E. The L&N tracks are several miles away. Water comes from the Richland Water District, which provides a 10-inch (25.4-cm) water line on the property. Gas is furnished by Peoples Gas Company and electricity could be installed by the Cumberland Valley RECC. Sewage treatment would be by package plant, if legal and feasible.

In terms of sewage plant capacity, Barbourville is operating well under capacity. The Barbourville Water and Electric Company's sewerage system is designed for 450,000 gallons per day (0.020 m^3/s). However, the average daily flow now is approximately 300,000 gallons (1.14 x 10^{-3} m^3) *(8)*.

BASIC INTRASTRUCTURE AND ENVIRONMENT OF TARGET AREA

Basic services provided by facilities and population within the target area vary in degrees of quality and quantity. Included are inventories of the following basic services: health, education, transportation, water and power supplies, sanitation facilities, police and fire protection, and recreation.

Table 1 is a summary of health facilities available within the target area. Each county has a health department and a reasonably well-equipped hospital. Presented in Table 2 is a survey of professional medical personnel in each of the three counties. A breakdown of type of medical practitioners and number of physicians per capita is shown in Table 3. Measures of degree of medical indigence are listed in Table 4.

An inventory of educational facilities, which includes numbers of students and teachers, is presented in Table 5. In expenditures per pupil for the school systems of the area, it was determined that Knox

County was the leader with $454 per pupil. Whitley County was next in expenditures with $421 per pupil, followed by Corbin $411, Williamsburg $404, and Laurel County $357 *(9)*.

An inventory of transportation facilities within the area revealed the predominant means of moving people and goods was by highway. A comparatively small percentage of the overall transportation system can be categorized as railroad and air transport, and there are no navigable streams within the area. Approximately 100 miles (160 kilometers) of railroad tracks traverse the area. The area is served by L&N Railroad. Services are limited to freight transport. The area is served by the London-Corbin War Memorial Airport, which has a runway 6,000 feet (1829 m) long. The airport has regularly scheduled commercial flights by Piedmont Airlines.

Interstate 75 is the major route in the area. Corbin lies approximately two miles (3.2 kilometers) east of I 75 and is greatly influenced by access made possible by the highway. The Daniel Boone Parkway, which will connect London and Hazard, will probably have a great deal of influence on the growth of London as a trade center for the area eastward along the parkway.

Of the approximately 17 miles (27 kilometers) between Corbin and Barbourville, 5 miles (8 kilometers) of partially controlled, four-lane highway has been completed; 5 miles (8 kilometers) of a similar type highway is under construction and has been designated as a growth center developmental highway; and the remaining 5 miles (8 kilometers) has yet to be let for reconstruction. Table 6 is a summary of volume and accident statistics along US 25E from 1967 through 1971. The average volume on the study section increased steadily between 1967 and 1971. Total accidents on the 4.886 miles (7.863 kilometers) of US 25E were 25 for both 1967 and 1969 and increased to 36 in 1971. The accompanying accident rates per 100 million vehicle-miles (161 million vehicle-kilometers) in Table 6 are considerably greater than the average rate of 249 for two-lane sections of rural highways elsewhere in Kentucky. Traffic congestion is not a major problem in the area.

The environment within the area is very similar to many other sections on the outer edges of rural Appalachia. Pollution exists in the forms of poor water quality and a general dispersal of unsightly trash. However, there is little or no air and noise pollution. Table 7 is a summary of acceptable and unacceptable water samples from the area. Requirements and capacities of water treatment plants in the area are presented in Table 8. The Knox County service area has the only treatment plant operating near capacity.

Sewer service systems are summarized in Table 9. Both the Knox and the Wood Creek service areas have sewage treatment plants which are approaching capacity. Solid wastes are disposed of in sanitary landfill sites now in operation in Knox, Laurel, and Whitley Counties. An inventory of existing public utilities is presented in Table 10. Table 11 is a summary of staffs and equipment available to provide police and fire protection in the area.

Within the boundaries of the area are the following recreational facilities: a state resort park, a state park, and a state shrine. Cumberland Falls State Park, with an annual visitation of 2,263,103 during 1970, is probably the most widely known and highly developed recreational facility within the area. Levi Jackson State Park, which attracts outdoor enthusiasts and campers, had 1,172,247 visitors during 1970. The other state-operated facility, Thomas Walker State Shrine, is primarily an historical site which attracted 73,197 visitors in 1970. Table 12 shows the trend in visitation at these three state-owned facilities from 1965 through 1970.

Another major recreational development, the Laurel River Reservoir, is now under construction and is expected to be open in the near future. This 6,000-acre (24 x 10^3-m^2) lake, located west of I 75 on the Laurel-Whitley county line, is designed for the multiple uses of flood protection and recreation. Recreational developments and demand for leisure services and businesses are expected to create a significant increase in recreational-related income in the area.

There are a number of other outdoor recreational facilities which are privately operated or administered by the city or county government. Among these are: several golf courses and country clubs, a large number of small to medium lakes, a few small parks and zoos, and several outdoor sports facilities located at or near schools and colleges within the area. Table 13 is an inventory of outdoor recreational facilities within the area.

HUMAN RESOURCE DEVELOPMENT

Despite gains in per capita and personal income, total employment has tended to decline for the past two decades. Added industrial expansion in these communities could conceivably increase total income and purchasing power and create other jobs.

A promising trend in the area is the increased average educational achievement by the population. As shown in Table 14, median educational achievement

steadily increased in all three counties for both women and men between 1940 and 1970. Also presented in Table 14 are predicted educational achievement levels by 1980. Median educational achievement levels were consistently higher for Barbourville, London, and Corbin than for their respective counties.

Unemployment rates in the area have historically been high, although drastic fluctuations have occurred. Knox County traditionally has had high unemployment rates, whereas Whitley and Laurel Counties have had and are still experiencing unemployment rates comparable to current national averages. Table 15 lists unemployment rates for selected years through 1972.

A measure of the distribution of the labor force by age is presented in Table 16. Very similar trends are noted for both male and female labor forces.

INCOME ANALYSIS

In any study of economic development potential within an area, income analysis is normally relevant. Generally, long-run increases in total personal income and per capita income indicate some economic growth has taken place. Several types of income indicators show, despite inflation, gains in purchasing power within the area have been fairly substantial. As a fundamental principle of economics, people spend higher absolute amounts of money with extra income, though perhaps not higher relative to total income received. In addition, they tend to allocate a smaller percentage of their total income to basic necessities, such as food, and thereby spend more on luxury items and services. With consumers willing to spend more for items other than necessities, the trend opens possibilities for new services and luxury-goods businesses to evolve. The present economy is greatly supplemented by this new investment resulting in a more diversified, healthy economic situation.

Numerous reasons may be cited for the increase in income within the study area. First, the most obvious reason is declining agricultural employment throughout the region. Agricultural employment incomes, especially on the smaller farms, approach a subsistence level, a life style from which more and more people in the area wish to escape. With the decline in number of farmers during 1930 to 1970, that employment base decrease was counteracted by a large increase in manufacturing employment. Industrial plants in the area provided jobs and (or) an income supplement for unskilled and semiskilled workers. The lure of higher industrial wages was sufficient to decrease the agricultural employment base. Finally, the major decline in railroad and coal businesses aided the area in a long-run sense. Although the slump of these industries in the early 1950's brought about widespread unemployment and out-migration to Ohio, Michigan, etc., it nevertheless helped the towns of the area (especially Corbin) to move from the concept of one-industry employment. Diversification of business and industry became a prerequisite for continued survival and growth.

Total personal income (total income received before taxes) in the area has increased considerably since 1940. In that year Knox, Laurel, and Whitley Counties had total personal incomes (in $1,000) of $4,193, $4,572, and $6,337, respectively. By 1969 these figures had risen to $32,268, $41,637, and $54,230, respectively. A summary of these and other income statistics are presented in Table 18. Likewise, a large increase in per capita income was noted as shown in Table 18. Per capita income in Knox County rose from $392 in 1950 to $1,300 in 1969 while in Laurel and Whitley it rose from $481 and $582 in 1950 to $1,600 and $2,180. In terms of family median income, Knox rose from $1,069 (1950) to $3,526 (1970); Laurel climbed from $1,163 (1950) to $4,802 (1970); Whitley jumped from $1,263 (1950) to $4,335 (1970). Median family income also rose in the three major cities.

Looking to 1980, the future appears to point toward even higher incomes. Total personal income (in $1,000) in Knox, Laurel, and Whitley Counties should approach $33,650, $53,250 and $52,150, respectively. Total per capita income for the three counties will likely be in the neighborhood of $1,605 for Knox, $2,300 for Laurel, and $2,465 for Whitley. Likewise, family median income for each city is projected to be $3,028 for Barbourville, $7,336 for London, and $7,287 for Corbin. The predicted family median income will be $4,755 in Knox, $9,604 in Laurel, and $5,871 in Whitley County. These projections are also shown in Tables 17 and 18.

As previously mentioned, the sources of income in the area have changed radically in the last 40 years from predominantly agricultural activities to a somewhat industrialized economy. Total employment in the area has, however, fluctuated dramatically; there has been a general trend toward lower totals in Knox and Whitley Counties in succeeding years; in Laurel County, the total employment has increased. As shown in Table 19, total employment by county by 1980 is predicted to be 5,858 (Knox), 6,758 (Laurel), and 5,053 (Whilely). However, with the influx of many new industries into the area, these totals could be considerably higher. Eight prominent, basic business activities were studied in an analysis of trends from 1930 to 1970. Prediction techniques were applied to the four which were expected to have the greatest impact on future economy of the area. Of these four, all have increased, with the

exception of agricultural employment. The area's employment base is predicted for 1980 as shown in Table 20. Table 21 lists employment trends of four other prominent business activities for which no predicted values were established for 1980. Included in this table are: mining and quarrying; contract construction; transportation, communications, and utilities; and finance, insurance, and real estate.

Manufacturing investment in the past several years has been quite substantial, through rather volatile at times. Table 22 shows the manufacturing developments and expansion in the area for several selected years from 1958 to 1969. Since large investments have occurred continually throughout this period, it may be appropriate to conclude that a healthy climate for business expansion exists.

In the study of underdeveloped areas, analysts have linked overall growth to the amount of manufacturing employment. Rises in per capita income have been partially accounted for by increased employment in manufacturing industries. However, increases in income occur only up to a certain point, after which additional manufacturing employment will not create significant increases in per capita income. Nevertheless, within a relevant range of manufacturing employment, a high correlation appears to exist between manufacturing employment and per capita income.

A multiple regression analysis with annual manufacturing employment as the dependent variable and per capita income as the independent variable was made for each of the three counties in the area. A summary of relevant statistical measures is presented in Table 23. It was found that annual manufacturing employment is a very good indicator of expected per capita income. Dependency of the area on manufacturing employment as an income producer was apparent from the close relationship found in the regression analyses. The degree to which the independent variable was able to explain variance in the dependent variable is listed as the squared correlation coefficient (R^2).

From statistical data presented, the per capita income of Knox County can most accurately be predicted based only on annual manufacturing employment. Less accurate prediction equations were obtained for Laurel and Whitley Counties.

An historical examination of bank deposits in an area is another means of ascertaining trends in total income. The majority of large transactions and many smaller ones are paid by check. A checking account study, therefore, provides some indication of growth or decline in business activity within a region over a period of several years. Savings accounts are based on two major motives: (1) precautionary and (2) speculative, both of which are functions of short-term economic conditions. A long-range review of savings accounts over several years would very likely yield no consistent trends unless economic conditions for that period had remained reasonably stable. In checking accounts, however, a long-run trend is relatively predictable.

Deposits of commercial banks in the area have increased (Table 24) very consistently since 1960, at which time they were (in $1,000) $2,397 (Knox), $6,365 (Laurel), and $7,292 (Whitley). According to FDIC figures, they had risen in 1970 to $5,832 (Knox), $14,815 (Laurel), and $12,735 (Whitley). This increase provides justification to the theory that the area is already developing.

Table 25 shows a statement of operations by funds and a statement of receipts by funds for each of the three counties in the area. This shows an inventory of the major operations which occurred in each county government in fiscal year 1970.

Table 26 indicates the enormous increase in the assessed value of total property for the three counties from 1960 to 1970. In fact, the assessed value of total property for county taxes increased by several times from 1960 to 1970 (a change in Kentucky statutes required a 100-percent evaluation).

BASIC BUSINESS GROUPING INVENTORY

An inventory of the number of business establishments showed sharp gains in sales of the three major business types -- wholesale, retail and service business. In 1954, total wholesale sales (in $1,000) were $1,352 (Knox), $9,003 (Laurel), and $4,344 (Whitley). By 1967, they had grown to $6,984 (Knox), $36,030 (Laurel), and $15,402 (Whitley). The 1980 predicted total wholesale sales by county are $12,227 (Knox), $61,514 (Laurel), and $16,696 (Whitley), as shown in Table 27.

Retail sales doubled from 1954 to 1967 in Knox and Whitley Counties, while Laurel County's sales tripled (Table 27). Predicted retail trade sales for 1980 (in $1,000) are $17, 850 (Knox), $24,615 (Laurel), and $30,356 (Whitley). Service business receipts (in $1,000) by county in 1980 are $726 (Knox), $10,160 (Laurel), and $5,195 (Whitley).

The number of wholesale establishments has fluctuated to some extent in Laurel and Whitley Counties, while remaining reasonably constant in Knox (Table 28). In 1967, the total number of wholesale establishments in the area was 76. In that year, there were 768 retail businesses, an increase of only 58 in 13 years. Knox County actually experienced a loss of retail establishments.

The service industry is an excellent indicator of economic development. Where service in an area flourishes, consumers are apparently able and willing to afford more than basic necessities, many of which come in the form of goods. If service industry growth is, in fact, indicative of overall development, then the area had grown economically even before the US 25E construction project emerged. The number of service-related business establishments grew from a 1954 total of 181 to 351 in 1967 (Table 28).

COMMUTING PATTERNS

Along stretches on US 25E between Corbin and Barbourville, the 1965 ADT's ranged from a low of 1,970 to a high of 6,470. In 1971, the road had to accommodate ADT's of a low of 5,000 to a high of 7,310. It is apparent that a low level of service is being provided by the remaining old sections of road. The 17-mile (27-kilometer) stretch is approximately a 30-minute drive by car. Traffic movement sometimes comes to a halt near the winding, upsloping sections. The major constraint to an efficient flow of traffic on US 25E arises from a hilly section about equidistant between Corbin and Barbourville. Motorists face a series of 11 hairpin curves which slope alternately up and down. Numerous trucks and farm vehicles also contribute to the slow movement of traffic.

Judging from the major industrial growth in Corbin and London in the last few years and the relatively slow development in Knox County, it must be assumed that Knox Countians rely heavily on commuting to other counties for work.

To evaluate the commuting patterns and commuting range of workers at some of the larger industries in the tri-county area, a sample was taken at five major businesses in the area: (1) the Cumberland Valley RECC (Barbourville), (2) Pepsi-Cola, Inc. (Corbin), (3) National Standard Company (Corbin), (4) American Greetings, Inc. (Corbin), and (5) Warner Brothers, Inc. (Barbourville). Total sample size was 1,211. The breakdown of employees by plants were: Warner's - 206, National Standard - 233, Pepsi-Cola - 90, American Greetings - 642, and Cumberland Valley RECC - 50. The average commuting time to work for these workers was 21.5 minutes with a standard deviation of 9.5 minutes. An effort was made to isolate those commuters who used US 25E. The breakdown of this selected sample of 387 employees was as follows: Warner's - 147, Cumberland Valley RECC - 50, American Greetings - 96, National Standard - 83, and Pepsi-Cola - 11. The mean commuting times was 26.2 minutes, with a standard deviation of 11.2 minutes.

The driving time between the two cities should be decreased significantly by the reconstruction of US 25E. If the commuting time is reduced, this will indicate transportation benefits are apparent. Of course, decreasing commuting times may also increase feasible commuter distances.

A survey of some businesses in the "after" study will either substantiate or invalidate the assumption that driving times will decrease. Table 29 is a summary of commuting patterns for the total sample and of the users of US 25E. Table 30 indicates the commuting patterns of workers who cross county and state lines.

ANALYSIS OF POPULATION

The area, as a whole, did not experience significant increases in population between 1940 and 1970. Instead, there were decreases in the population of both Knox and Whitley Counties, while Laurel County showed only a slight increase. Overall, there was a 16.3 percent decrease in population of the area between 1940 and 1970. The trend for the three towns indicated somewhat different results. Of the three, Barbourville experienced the greatest increase in population between 1940 to 1970. This contrasted with the county populations in which Knox showed a great decrease. The three towns showed a combined increase of 5.2 percent between 1940 and 1970. A summary of populations for the towns and counties for 1940 through 1970 and the least-squares predicted populations for 1980 are presented in Table 31.

From analysis of population trends, it was apparent the population decreases for Knox and Whitley Counties were attributable to out-migration. Table 32 is a summary of the area births, deaths, and migration figures for the years 1940 through 1970. Distributions of population of the area counties by age group and sex are presented in Table 33.

As in many other sections of rural Appalachia, the area has a lower than average number of high school graduates who attend college. The statewide average is 41.3 percent as compared to an average of 32.7 percent for the area. The percentage of ninth graders in the area who completed high school is also less than the average for Kentucky. It is interesting to note that Laurel County had the largest percentage of ninth graders completing high school and the smallest percentage of high school graduates attending college. A summary of educational achievement levels is presented in Table 34.

SUMMARY

A comprehensive analysis of the area and growth center has revealed social and economic mediocrity are commonplace. Many existing characteristics considered to be essential for economic prosperity are lacking. Per capita income and educational achievement levels are lower than statewide averages. Medical and health facilities are adequate for general practice but are not equipped to handle special cases. Medical indigence is widespread. Transportation is dependent upon highways. Recreational facilities within the area are not highly developed and there exists ample opportunity for expanding services and attractions.

On the other hand, target area has adequate industrial and recreational potential to insure economic growth when appropriate factors are combined. It was hypothesized that reconstruction of the section of US 25E between Corbin and Barbourville will be the catalyst to initiate new economic growth and provide general upgrading of the standard of living in the area. Upgrading the standard of living may be the first step in reversing the basic out-migration problem and would, in the long run, create a means for encouraging a more balanced population pattern. Urban areas and the total environment would benefit by dispersal of industrial growth to less populated and industrialized sections of the nation.

TABLE 1

HEALTH FACILITIES IN 1970[a]

	COUNTY		
	KNOX	LAUREL	WHITLEY
City	Barbourville	London	Corbin
Hospitals	Knox County General	Marymount	Southeastern Kentucky Baptist
Number of Beds	40	63	84
Nursing Homes	Knox County General Hospital ECF Boone Manor	Laurel Heights Home for the Elderly	None
Number of Beds	71	50	None
Personal Care Homes	Boone Manor Nursing Home	Laurel Heights Home for the Elderly	None
Public Health	Knox County Health Department	Laurel County Health Department	Whitley County Health Department

[a]Source: Kentucky Department of Health, Office of Biostatistics

TABLE 2

PROFESSIONAL MEDICAL PERSONNEL[a]

	COUNTY		
	KNOX	LAUREL	WHITLEY
Physicians	12	13	25
Nurses	16	27	39
Dentists	2	4	7

[a]Source: Kentucky Department of Health

TABLE 3

MEDICAL PRACTITIONERS IN 1970[a]

	COUNTY			
	KNOX	LAUREL	WHITLEY	TOTAL
General Practice	4	7	14	25
General Surgery	2	1	4	7
General Practice and Surgery				0
Internal Medicine	1	3		4
Obstetrics and Gynecology				0
Pediatrics	2		1	3
Otolaryngology and Ophthalmology				0
Specialized Surgery				0
Premedical and Public Health			1	1
Pathology and Radiology			1	1
Psychiatry				0
Anesthesiology				0
Total	9	11	21	41
Physicians per 1000 population	.38	.40	.87	.55
Patients per Physician	2632	2490	1150	1835

[a]Source: Kentucky Medical Directory

TABLE 4

FY 1969-1970 MEDICAL CARE,
PUBLIC ASSISTANCE, AND MEDICAL INDIGENTS[a]

	COUNTY			
	KNOX	LAUREL	WHITLEY	TOTAL
Number on Medical Care Only	2545	1530	1524	5599
Percent of Population	11	6	6	23
Number on Public Assistance	3878	2452	3219	9549
Percent of Population	16	9	13	38
Number of Medical Indigents	6423	3982	4743	15148
Percent of Population	27	15	20	62

[a]Source: Department of Economic Security, **Public Assistance in Kentucky** (PA-264 Report Series), Fiscal Year 1969-1970.

TABLE 5

EDUCATIONAL FACILITIES[a]

COUNTY	COMMUNITY	NAME OF SCHOOL	TYPE OF SCHOOL	NUMBER OF STUDENTS	NUMBER OF TEACHERS
Knox	Barbourville	Union College	4-year College	926	64
		Knox County Vocational Extension Center	Vocational School	275	9
		Knox Central High	High School	1099	55
		Barbourville High	High School	260	14
	Corbin	Lynn Camp High	High School	281	18
		St. Camilus Academy	High School	72	7
	Artemus	Artemus	Elementary School	271	12
	Barbourville	Knox Central	Elementary School	443	17
		Barbourville	Elementary School	271	11
	Boone	Boone	Elementary School	392	13
	Corbin	Lynn Camp	Elementary School	367	14
	Dewitt	Dewitt	Elementary School	431	14
	Flat Lick	Flat Lick	Elementary School	356	11
	Girdler	Girdler	Elementary School	303	11
	Gray	Gray	Elementary School	433	16
Laurel	London	Sue Bennett Junior College	2-year College	192	21
		Laurel County Vocational School	Vocational School	161	5
		Laurel County High	High School	1232	62
		London Junior High	Junior High School	621	26
		Lily Junior High	Junior High School	460	19
	Bush	Bush Junior High	Junior High School	345	14
	East Bernstadt	Hazel Green Junior High	Junior High School	339	15
	Bush	Bush	Elementary School	249	15
	Colony	Colony	Elementary School	401	14
	East Bernstadt	East Bernstadt	Elementary School	231	9
		Hazel Green	Elementary School	450	16
	Johnson	Johnson	Elementary School	307	15
	Keavy	Keavy	Elementary School	419	15
	London	London	Elementary School	744	28
		Camp Ground	Elementary School	339	15
	North Corbin	Felts	Elementary School	286	11
	Pittsburg	Pittsburg	Elementary School	218	10
	Sublimity	Sublimity	Elementary School	406	19
Whitley	Corbin	Corbin Area Vocational Education Center	Vocational School	237	13
		Corbin High	High School	561	30
		Central	Elementary School	486	18
		East	Elementary School	292	12
		South	Elementary School	287	11

[a]Source: Primary Data Collection, Kentucky Department of Education

TABLE 6

TRAFFIC VOLUMES AND ACCIDENT STATISTICS
FOR THE DEVELOPMENTAL HIGHWAY
(4.886 miles (7.863 km) between Corbin and Barbourville)

YEAR	NUMBER OF ACCIDENTS	AADT	ACCIDENTS PER 100 MVM (160 MVK)
1967	25	3950	355
1969	25	4245	330
1971	36	5000	404

TABLE 7

1972 BACTERIOLOGICAL SAMPLES
FOR WATER UTILITIES[a]

COUNTY	LOCATION	NUMBER OF SAMPLES	POSITIVE SAMPLES
Knox	Barbourville	22	1
	East Knox Water District	6	0
Laurel	Laurel # 2	48	0
	London	21	0
	West Laurel	10	0
	Wood Creek	50	1
Whitley	Corbin	16	1
	Cumberland Falls State Park	7	1
	Whitley County Water District	6	1
	Williamsburg	64	5

[a]Source: Kentucky Department of Health

TABLE 8

PRESENT WATER SUPPLY SYSTEMS[a]

	KNOX COUNTY SERVICE AREA	LAUREL RIVER SERVICE AREA	WOOD CREEK SERVICE AREA
Total Population of Service Area	19319	25768	19132
Population Served	9170	18355	11880
Plant Requirements (mgd)	0.79	2.05	1.40
Plant Capacity (mgd)	0.97[b]	5.50	2.26[c]

[a]Source: Preliminary Draft, *Comprehensive Water/Sewer Program*, Mayes, Sudderth, and Etheridge, Inc., April 1973.

[b]Barbourville and East Knox Plants

[c]London and Wood Creek Plants

TABLE 9

PRESENT SEWER SERVICE SYSTEMS[a]

	KNOX COUNTY GENERAL SERVICE AREA		LAUREL RIVER GENERAL SERVICE AREA	WOOD CREEK GENERAL SERVICE AREA
Location	Artemus	Barbourville	Corbin	London
Total Population of Service Area	600	3789	8610	6150
Population Served		3550	7400	4350
Plant Requirements (mgd)		0.40	1.50	0.95
Plant Capacity (mgd),		0.48	2.25	1.00

[a]Source: Preliminary Draft, *Comprehensive Water/Sewer Program*, Mayes, Sudderth, and Etheridge, Inc., April 1973

TABLE 10

PUBLIC UTILITIES[a]

SUBDIVISION	ELECTRIC SERVICE	TELEPHONE SERVICE	NATURAL GAS SERVICE
Knox County	Cumberland Valley RECC	Kentucky Telephone Co	Knox Gas Co
Barbourville	Barbourville Water and Electric Co	Kentucky Telephone Co	Peoples Gas Co
Laurel County	Jackson County RECC	Kentucky Telephone Co	
London	Kentucky Utilities Co	Kentucky Telephone Co	London Gas Co
Whitley County	Cumberland Valley RECC and TVA	South Central Bell	
Corbin	City Utilities Commission	South Central Bell	Peoples Gas Co
Williamsburg	Kentucky Utilities Co	South Central Bell	Williamsburg Gas Co

[a]Source: **Industrial Resources**, Kentucky Department of Commerce, 1969, 1970, 1971

TABLE 11

POLICE AND FIRE PROTECTION[a]

	POLICE PROTECTION		FIRE PROTECTION	
SUBDIVISION	TOTAL STAFF	RADIO-EQUIPPED VEHICLES	FULL-TIME STAFF	VOLUNTEER STAFF
Knox County	14			
Barbourville	6	2	1	17
Laurel County	4	2		11
London	7	2		22
Whitley County	5	2		
Corbin	9	3	11	10
Williamsburg	6	1	1	20

[a]Source: **Industrial Resources**, Kentucky Department of Commerce, 1969, 1970, 1971

TABLE 12

ANNUAL VISITATION AT STATE-OPERATED RECREATIONAL FACILITIES[a]

YEAR	CUMBERLAND FALLS STATE RESORT PARK	LEVI JACKSON STATE PARK	DR THOMAS WALKER STATE SHRINE
1965	906,579	873,744	24,374
1966	1,010,996	973,510	36,235
1967	1,524,579	936,496	47,641
1968	1,516,688	869,606	48,735
1969	1,528,579	947,487	57,287
1970	2,263,103	1,172,247	73,197

[a]Source: Kentucky Department of Parks

TABLE 13

OUTDOOR RECREATIONAL FACILITIES[a]

KNOX COUNTY	LAUREL COUNTY	WHITLEY COUNTY
Corbin Driving Range	Buck Creek Boat Dock (Lake Cumberland)	Corbin Reservoir
Tri-County Golf Course	Circle R Lake	Funland Park
Indian Springs Country Club	Dog Patch Zoo	Williamsburg Country Club
Legion Field (Multiple-Use Sports)	Dorthae Dam Lake	Corbin High School (Sports Facilities)
Swan Lake	Feltner 4-H Camp	Whitley County High School (Sports Facilities)
Union College (Sports Facilities)	Laurel Impoundment	Gatliff Field (Multiple-Use Sports)
Wilton Lake	London Country Club	
Knox Central High School (Sports Facilities)	Sue Bennett College (Sports Facilities)	
Lynn Camp High School (Sports Facilities)	Mill Street Park	
	Laurel County High School (Sports Facilities)	
	Woods Creek Lake	

[a]Source: **Outdoor Recreation Plan for Kentucky**, Kentucky Department of Parks

TABLE 14

MEDIAN LEVELS (IN YEARS) OF EDUCATIONAL ACHIEVEMENT[a]
(for those 25 years and older)

SEX	SUBDIVISION	1940	1950	1960	1970	PREDICTED 1980
	Barbourville		11.7	9.2	11.4	10.5
	London		9.6	10.8	11.7	12.8
	Corbin		8.7	9.0	10.9	11.7
Males	Knox County	6.7	7.0	7.7	8.2	8.7
	Laurel County	7.0	8.0	8.1	8.5	9.1
	Whitley County	7.4	8.0	8.3	8.6	9.1
Females	Knox County	7.1	7.5	8.1	8.5	9.2
	Laurel County	7.3	8.1	8.4	8.7	9.3
	Whitley County	7.5	8.1	8.4	8.7	9.2

[a]Source: US Census of Population, 1940-1970

TABLE 15

UNEMPLOYMENT RATES[a]

YEAR	COUNTY	TOTAL LABOR FORCE	TOTAL EMPLOYED	UNEMPLOYMENT RATE (PERCENT)
1964	Knox	4098	3526	14.0
	Laurel	6703	6215	7.3
	Whitley	6484	5832	10.1
1966	Knox	4352	3449	20.7
	Laurel	6655	6224	6.5
	Whitley	6723	6326	5.9
1971	Knox	4900	4400	10.2
	Laurel	7120	6540	8.1
	Whitley	7680	7160	6.4
Oct 1972	Knox	5430	4880	11.0
	Laurel	8400	7840	7.5
	Whitley	8210	7590	7.9

[a]Source: Kentucky Department of Economic Security

TABLE 16

PERCENTAGE OF AGE GROUPS IN LABOR FORCE[a]

	KNOX COUNTY		LAUREL COUNTY		WHITLEY COUNTY	
AGE GROUP	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE
18 and 19	41.4	29.8	38.7	32.1	34.2	37.2
20 and 21	57.0	39.0	78.7	46.5	50.8	47.5
22 to 24	76.0	42.2	80.3	40.5	65.0	44.9
25 to 34	75.4	26.4	88.1	37.1	82.7	34.9
35 to 44	74.9	35.4	85.7	36.4	77.2	34.7
45 to 64	54.2	27.0	65.7	24.9	58.7	25.0
65 and over	16.2	6.1	11.3	4.3	7.7	3.4

[a]Source: US Census of Population, 1970

TABLE 17

INCOME STATISTICS

PERSONAL INCOME (IN $1,000's)[a]

YEAR	KNOX COUNTY	LAUREL COUNTY	WHITLEY COUNTY
1965	$19,753	$30,025	$33,495
1966	22,740	35,598	35,459
1967	23,272	39,255	41,543
1968	25,480	38,813	47,991
1969	32,268	41,637	54,230
1980[c]	60,804	70,147	112,999

MEDIAN FAMILY INCOME[b]

YEAR	KNOX COUNTY	LAUREL COUNTY	WHITLEY COUNTY
1950	$1,069	$1,163	$1,263
1960	1,722	2,272	2,312
1970	3,526	4,802	4,335
1980[c]	4,755	9,604	5,871

MEDIAN FAMILY INCOME[b]

YEAR	BARBOURVILLE	LONDON	CORBIN
1950	$1,283	$1,897	$2,564
1960	2,882	4,439	4,018
1970	2,446	5,490	5,745
1980[c]	3,028	7,336	7,287

[a]Source: Office of Developmental Services, University of Kentucky

[b]Source: US Census of Population, 1950-1970

[c]Predicted

TABLE 18

PER CAPITA INCOME[a]

YEAR	KNOX COUNTY	LAUREL COUNTY	WHITLEY COUNTY
1950	$392	$481	$582
1951	445	556	642
1952	438	591	722
1953	469	627	725
1954	420	588	746
1955	462	612	779
1957	441	497	729
1958	463	858	672
1959	470	848	711
1960	501	833	841
1961	558	901	859
1962	693	1018	1061
1965	892	1202	1340
1966	1036	1400	1414
1967	1058	1582	1643
1968	1241	1849	1882
1969	1300	1600	2180
Predicted 1980	1605	2300	2465

[a]Source: Kentucky Department of Economic Security

TABLE 19

TOTAL EMPLOYMENT[a]

YEAR		KNOX	BARBOURVILLE	LAUREL	LONDON	WHITLEY	CORBIN
1940	Employment	8162		7140		7643	2411
	Percent of Total Employed in County	100		100		100	32
1950	Employment	7380	813	7019	1219	8824	2609
	Percent of Total Employed in County	100	11	100	17	100	30
1960	Employment	4828	949	6081	1370	5823	2077
	Percent of Total Employed in County	100	18	100	23	100	36
1970	Employment	5666	1168	7287	1402	5964	2608
	Percent of Total Employed in County	100	21	100	19	100	44
1980 (Predicted)	Employment	5858	1332	6758	1513	5053	2441
	Percent of Total Employed in County	100	23	100	23	100	48

[a]Source: US Census of Population

TABLE 20

EMPLOYMENT STATISTICS[a]

COUNTY	YEAR	WHOLESALE AND RETAIL TRADE	MANUFACTURING	AGRICULTURAL	PROFESSIONAL
Knox	1930	359	470	4004	279
	1940	522	268	3529	322
	1950	789	547	2274	425
	1960	822	639	457	475
	1970	979	1062	334	1234
	1980[b]	1156	1076	220[c]	1166
Laurel	1930	287	195	3813	250
	1940	574	193	3432	273
	1950	964	573	2968	362
	1960	1124	607	1633	381
	1970	1690	1344	730	942
	1980[b]	1925	1398	500[c]	889
Whitley	1930	546	766	3903	407
	1940	807	249	2498	381
	1950	728	1059	2539	370
	1960	1261	617	851	500
	1970	1197	1071	135	1009
	1980[b]	1480	969	100[c]	971

[a]Source: US Census of Population, 1930-1970

[b]Predicted

[c]Prediction not made by method of least squares

TABLE 21

BASIC INDUSTRY EMPLOYMENT

COUNTY	YEAR	MINING AND QUARRYING	CONTRACT CONSTRUCTION	TRANSPORTATION, COMMUNICATIONS, AND UTILITIES	SERVICES
Knox	1930	853	171	848	200
	1940	1419	183	588	347
	1950	1411	317	793	477
	1960	495	328	446	615
	1970	184	522	412	612
Laurel	1930	370	120	490	156
	1940	520	202	415	346
	1950	418	379	581	505
	1960	163	457	461	690
	1970	67	726	644	800
Whitley	1930	13	208	1162	297
	1940	1331	219	996	837
	1950	1276	416	1323	678
	1960	643	301	768	625
	1970	201	620	614	752

[a]Source: US Census of Population, 1930-1970

TABLE 22

MANUFACTURING DEVELOPMENTS AND EXPANSION[a]

YEAR	LOCATION	BUSINESS	EXPENDITURE	EXPANSION	NEW
1958	London	Joe W. Payne Co	$35,000		X
1959	Corbin	Corbin Aluminum, Inc	9,000		X
	London	O. P. Link Handle Co	50,000		X
1961	Corbin	Corbin Electric Products	5,735,000		X
	Corbin	National Standard Co	1,400,000		X
	Corbin	Val-San Chemical Co	50,000		X
1962	Barbourville	E-K Wood Products	Not Available		X
	Corbin	Corbin Brick Co	110,000	X	
	London	Caron Spinning Co	1,150,000		X
1963	Corbin	Pennington Block Co	55,000	X	
	London	Avalon Cheese Co	110,000	X	
	London	Griffin Pie Co	40,000	X	
	London	Lucas Ready-Mix Concrete	50,000	X	
1964	Barbourville	Cumberland Charcoal Co	75,000	X	
	Barbourville	Disney Mop Co	Not Available	X	
1965	Corbin	Corbin Manufacturing & Sales Co	Not Available	X	
	London	Caron Spinning Co	1,220,000	X	
	London	Chaney Lumber Co	52,000	X	
	London	Chappell's Dairy	200,000	X	
	London	Griffin Pie Co, Inc	200,000	X	
	London	Kentucky House Trailers, Inc	20,000	X	
1966	Barbourville	Warner Bros, Inc	1,000,000		X
	Corbin	Wood Products, Inc	Not Available	X	
1967	Corbin	American Greetings, Inc	6,500,000		X
1968	Barbourville	East-Kentucky Steel, Inc	250,000		X
	Barbourville	Warner Bros, Inc	Not Available	X	
	Corbin	Elicon Corbin, Inc	Not Available	X	
	London	Caron Spinning Co	Not Available	X	
	London	Griffin Pie Co, Inc	90,000	X	
	London	Warner Bros, Inc	Not Available	X	
1969	London	Caron Spinning Co	250,000		X

[a]Source: Kentucky Department of Commerce

TABLE 23

REGRESSION ANALYSIS OF ANNUAL MANUFACTURING EMPLOYMENT VS PER CAPITA INCOME (1950-1969)

	ANNUAL MANUFACTURING EMPLOYMENT (AME)		PER CAPITA INCOME (PCI)				
COUNTY	MEAN	STANDARD DEVIATION	MEAN	STANDARD DEVIATION	EQUATION	SQUARED CORRELATION COEFFICIENT	T-VALUE
Knox	448	236	$663.47	$312.33	PCI = 88.64 + 1.28 AME	0.94	15.7
Laurel	536	237	943.71	432.57	PCI = 62.02 + 1.64 AME	0.81	8.1
Whitley	506	245	1031.06	483.28	PCI = 172.47 + 1.70 AME	0.74	6.5

TABLE 24

DEMAND DEPOSITS IN ALL COMMERCIAL BANKS[a]

	DEMAND DEPOSITS (IN $1,000) AS OF JUNE			
COUNTY	1960	1964	1966	1970
Knox	$2,396.5	$3,329.9	$4,541.0	$5,832.0
Laurel	6,365.0	8,347.4	10,690.0	14,815.0
Whitley	7,291.9	9,066.3	9,199.0	12,735.0

[a]Source: *Summary of Accounts and Deposits in all Commercial Banks,* FDIC, National Summary for 1966 and 1970.
Distribution of Bank Deposits by Counties and SMA's, Board of Governors of the Federal Reserve System, for 1960 and 1964.

TABLE 25

STATEMENT OF OPERATIONS AND RECEIPTS
FOR COUNTY FUNDS
(For Fiscal Year Ended June 30, 1970)[a]

	KNOX	LAUREL	WHITLEY
Cash Balance, July 1, 1969	$25,547.18	$68,079.09	$36,290.78
Receipts			
Operating Receipts	177,815.98	244,029.65	145,384.18
Transfers	30,447.83	65,000.00	6,969.69
Borrowed Money	20,000.00	56,722.45	0
Employee's and Employer's Share	0	21,616.84	0
Total	253,810.99	455,448.03	188,644.65
Less Expenditures	210,316.86	357,784.00	140,985.59
Cash Balance, June 30, 1970	43,494.13	97,664.03	47,659.06
Operating Receipts			
Revenue from Local Taxes	130,334.96	175,421.23	101,804.12
Payments, State Treasurer	34,777.45	44,781.87	36,368.21
Excess Fees	0	7,094.57	0
Miscellaneous Income	11,703.57	16,731.98	7,211.85
Total	177,815.98	244,029.65	145,384.18

[a]Source: Knox, Laurel, and Whitley County Audits, Fiscal Year 1970

TABLE 26

TOTAL ASSESSED PROPERTY
VALUES FOR COUNTY TAXES[a]

	VALUE OF PROPERTY (IN MILLIONS OF DOLLARS)	
COUNTY	1960	1970
Knox	$12	$65
Laurel	19	132
Whitley	14	102

[a]Source: Department of Rural Sociology, College of Agriculture, University of Kentucky

TABLE 27

RECEIPTS BY BASIC BUSINESS GROUPS[a]

BUSINESS GROUP	COUNTY OR COMMUNITY	TOTAL RECEIPTS (IN $1,000)					
		1948	1954	1958	1963	1967	1980 PREDICTED
Retail	Knox	$6209	$7928	$9189	$10509	$13779	$17724
	Laurel	8528	12306	16352	21063	25530	36635
	Whitley	15379	17679	18997	26090	33657	43899
	Barbourville	3623	5254	5232	7105	9049	12176
	London	3129	10281	10672	15743	19655	24616
	Corbin	10319	11569	11887	15442	19600	30357
Wholesale	Knox		1352	4017	5046	6984	12227
	Laurel		9003	24049	28477	36030	61514
	Whitley		4344	7482	9460	15402	16696
Service	Knox		377	1872	632	720	969[b]
	Laurel		1056	1830	2363	6398	10160
	Whitley		1318	601	2590	3077	5195
	Barbourville		262	242	483	606	976[b]
	London		727	1295	2107	5923	9711
	Corbin		1061	1328	1922	1875	2909

[a]Source: US Census of Business

[b]Prediction technique gave inconsistent results

TABLE 28

INVENTORY OF BUSINESS ESTABLISHMENTS[a]

	WHOLESALE ESTABLISHMENTS			RETAIL ESTABLISHMENTS			SERVICE ESTABLISHMENTS		
YEAR	KNOX	LAUREL	WHITLEY	KNOX	LAUREL	WHITLEY	KNOX	LAUREL	WHITLEY
1954	12	20	19	194	234	282	33	58	90
1958	15	27	27	227	299	308	42	78	123
1963	14	30	27	198	249	365	55	102	150
1967	13	36	27	177	270	321	65	131	155

[a]Source: US Census of Business, 1948 through 1967

TABLE 29

COMMUTERS AND COMMUTING TIMES

BUSINESS	WORKERS SAMPLED	WORKERS USING US 25E
Warners (Barbourville)	206	147
Cumberland Valley RECC (Barbourville)	50	50
American Greetings Co (Corbin)	642	96
National Standard (Corbin)	223	83
Pepsi-Cola, Inc (Corbin)	90	11
Total	1211	387

ALL COMMUTERS SAMPLED

CLASS INTERVAL (Minutes)	MIDPOINT (Minutes)	OBSERVED FREQUENCY
0 - 9.9	5	63
10 - 19.9	15	555
20 - 29.9	25	404
30 - 39.9	35	124
40 - 49.9	45	62
50 - 59.9	55	0
60 - 69.9	65	2
70 - 79.9	75	1
Total		1211

COMMUTERS USING US 25E (Corbin - Barbourville)

CLASS INTERVAL (Minutes)	MIDPOINT (Minutes)	OBSERVED FREQUENCY
0 - 4.9	2.5	1
5 - 9.9	7.5	13
10 - 14.9	12.5	87
15 - 19.9	17.5	59
20 - 24.9	22.5	34
25 - 29.9	27.5	39
30 - 34.9	32.5	31
35 - 39.9	37.5	73
40 - 44.9	42.5	3
45 - 49.9	47.5	47
Total		387

TABLE 30

1972 COMMUTING PATTERNS

COUNTY	COMMUTING OUT OF	TO OR FROM COUNTY	COMMUTING INTO	RESIDE AND WORK IN COUNTY
Knox	131	Bell	24	
	30	Clay	19	
	45	Harlan	5	
	183	Laurel	101	
	7	Leslie	0	
	6	Pulaski	0	
	600	Whitley	205	
	0	Clairborne, Tenn	13	
Totals	1002		367	3055
Laurel	6	Bell	15	
	9	Casey	0	
	56	Clay	52	
	14	Fayette	0	
	10	Jackson	75	
	101	Knox	183	
	8	Lee	5	
	9	Leslie	0	
	0	Lincoln	13	
	14	Madison	0	
	19	Pulaski	22	
	30	Rockcastle	38	
	518	Whitley	258	
Totals	794		661	5306
Whitley	27	Bell	45	
	19	Clay	24	
	23	Harlan	0	
	0	Jackson	18	
	205	Knox	600	
	258	Laurel	518	
	9	Leslie	0	
	17	McCreary	50	
	7	Pulaski	5	
	10	Rockcastle	0	
	192	Campbell, Tenn	73	
	0	Clairborne, Tenn	21	
	26	Knox, Tenn	0	
	8	Scott, Tenn	12	
Totals	801		1366	3689

[a]Source: Bureau of Business, University of Kentucky

TABLE 31

POPULATIONS[a]

	POPULATION				
	1940	1950	1960	1970	1980 PREDICTED
Barbourville	2437	2926	3211	3549	3829
London	4120	3426	4035	4337	5110
Corbin	7893	7744	7119	7317	6958
Knox County	31029	30409	25258	23689	25223
Laurel County	25640	25797	24901	27386	28112
Whitley County	33186	31940	25815	24145	21561

[a]Source: US Census of Population, 1940-1970

TABLE 32

SUMMARY OF BIRTHS, DEATHS, AND MIGRATIONS[a]

PERIOD	COUNTY	POPULATION AT BEGINNING OF PERIOD	BIRTHS	DEATHS	BIRTHS LESS DEATHS	EXPECTED POPULATION AT END OF PERIOD	ACTUAL POPULATION AT END OF PERIOD	NET EFFECT OF MIGRATION
1930 - 1940	Knox	26266	8462	2572	5890	32156	31029	-1127
	Laurel	21109	5409	1482	3927	25036	25640	+604
	Whitley	33186	8576	2938	5638	38824	33186	-5638
1940 - 1950	Knox	31029	15997	2612	13385	44414	30409	-14005
	Laurel	25640	6810	1813	4979	30619	25797	-4822
	Whitley	33186	7879	2638	5241	38427	31940	-6487
1950 - 1960	Knox	30409	6706	2393	4313	34722	25258	-9464
	Laurel	25797	6213	2034	4179	29976	24901	-5075
	Whitley	31940	5877	2680	3197	35137	25815	-9322
1960 - 1970	Knox	25258	5082	2506	2576	27834	23689	-4145
	Laurel	24901	5523	2542	2981	27882	27386	-496
	Whitley	25815	4507	2934	1573	27388	24145	-3243

[a]Source: US Census of Population, 1930-1970, and Kentucky Department of Health, Office of Biostatistics

TABLE 33

POPULATION DISTRIBUTION BY AGE AND SEX (1970)

	KNOX COUNTY				LAUREL COUNTY				WHITLEY COUNTY			
	MALE		FEMALE		MALE		FEMALE		MALE		FEMALE	
AGE GROUP	POPULATION	PERCENT WITHIN AGE GROUP	POPULATION	PERCENT WITHIN AGE GROUP	POPULATION	PERCENT WITHIN AGE GROUP	POPULATION	PERCENT WITHIN AGE GROUP	POPULATION	PERCENT WITHIN AGE GROUP	POPULATION	PERCENT WITHIN AGE GROUP
⩾ 85	82	0.35	95	0.40	99	0.36	145	0.53	86	0.36	114	0.47
80 - 84	134	0.57	189	0.80	159	0.58	189	0.69	172	0.71	219	0.91
75 - 79	225	0.95	299	1.26	274	1.00	316	1.15	294	1.22	348	1.44
70 - 74	348	1.47	386	1.63	400	1.46	482	1.76	421	1.74	556	2.30
65 - 69	492	2.08	611	2.58	520	1.90	610	2.23	536	2.22	658	2.73
60 - 64	534	2.25	573	2.42	608	2.22	629	2.30	569	2.36	760	3.15
55 - 59	589	2.49	670	2.83	681	2.49	675	2.46	565	2.34	693	2.87
50 - 54	561	2.37	616	2.60	674	2.46	721	2.63	646	2.68	703	2.91
45 - 49	584	2.47	722	3.05	696	2.54	748	2.73	641	2.65	751	3.11
40 - 44	495	2.09	535	2.26	686	2.50	790	2.88	586	2.43	670	2.77
35 - 39	529	2.23	573	2.42	664	2.42	730	2.67	492	2.04	636	2.63
30 - 34	579	2.44	639	2.70	708	2.59	788	2.88	552	2.29	546	2.26
25 - 29	646	2.73	733	3.09	770	2.81	834	3.05	578	2.39	680	2.82
20 - 24	832	3.51	938	3.96	872	3.18	962	3.51	891	3.69	895	3.71
15 - 19	1232	5.20	1160	4.90	1312	4.79	1306	4.77	1295	5.36	1200	4.97
10 - 14	1191	5.03	1301	5.49	1487	5.43	1472	5.38	1305	5.40	1147	4.75
5 - 9	1240	5.23	1271	5.37	1514	5.53	1397	5.10	1163	4.82	1019	4.22
0 - 4	1072	4.53	1013	4.28	1283	4.68	1185	4.33	913	3.78	845	3.50
Totals	11365	47.98	12324	52.02	13407	48.96	13979	51.04	11705	48.48	12440	51.52

TABLE 34

HIGH SCHOOL GRADUATES AND ENROLLMENTS IN COLLEGE (1970)[a]

COUNTY	HIGH SCHOOL GRADUATES	PERCENT OF HIGH SCHOOL GRADUATES ATTENDING COLLEGE	PERCENT OF 9TH GRADERS COMPLETING HIGH SCHOOL
Knox	290	36.9	59.9
Laurel	325	50.0	58.9
Whitley	288	26.7	71.7

[a]Source: *Holding Power and Graduates (Kentucky Public and Non-Public High Schools)*, Kentucky Department of Education, February 1971

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